



EMI TEST REPORT

Test Report No. : 24GE0288-HO-1

Applicant : Pioneer Corporation
Type of Equipment : Digital Wireless Speaker System
(Transmitter)
Model No. : XW-HTD640(T)
Test standard : FCC Part 15 Subpart C : 2003
Section 15.207, Section 15.247
FCC ID : AJDT103
Test Result : Complied

1. This test report shall not be reproduced 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.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.
5. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

Date of test:

March 29, 30 and 31, 2004

Tested by:

Makoto Kosaka
EMC Service

Hiroka Umeyama
EMC Service

Approved by :

Hironobu Shimoji
Group Leader of
EMC Service

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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MF060b(10.04.03)

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2.2 Product Description

Pioneer Corporation, Model No. XW-HTD640(T) is the Digital Wireless Speaker System (Transmitter)

(Transmitter)

Equipment Type	:	Transmitter
Frequency band	:	from 2414 MHz to 2468 MHz
Frequency of operation	:	2414, 2432, 2450, 2468MHz
Type of Modulation	:	GFSK
Antenna Type	:	Dipole
Antenna Gain	:	0.44dBi
ITU code	:	F1D
Mode of operation	:	Simplex
Other clock frequency	:	8MHz and 24.576MHz.
Method of Frequency Generation	:	Crystal

(Receiver)

Type of Receiver	:	Receiver
Frequency band	:	from 2414 MHz to 2468 MHz
Frequency of operation	:	2414, 2432, 2450, 2468MHz
Type of Modulation	:	GFSK
Antenna Type	:	Dipole
Antenna Gain	:	0.44dBi
ITU code	:	F1D
Other clock frequency	:	8 MHz, 12.288 MHz, and 24.576MHz
Method of Frequency Generation	:	Crystal

FCC 15.31 (e)

This EUT provides stable voltage constantly to RF Module by the AC Adaptor. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2003

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2001	Section 15.207	-	N/A	19.8dB 0.2995MHz N	Complied
2	6dB Bandwidth	ANSI C63.4:2001	Section 15.247(a)(2)	Conducted	N/A	-	Complied
3	Maximum Peak Output Power	ANSI C63.4:2001	Section 15.247(b)(3)	Conducted	N/A	-	Complied
4	Out of Band Emission	ANSI C63.4:2001	Section 15.247 (c)	Conducted/ Radiated	N/A	1.2dB 4936MHz Vertical (Radiated)	Complied
5	Restricted Band Edges	ANSI C63.4:2001	Section 15.247 (c)	Conducted	N/A	-	Complied
6	Power Density	ANSI C63.4:2001	Section 15.247 (d)	Conducted	N/A	-	Complied

Note: UL Apex's EMI Work Procedures No.QPM05.

*These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".

*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99 % Occupied Band Width	RSS210(issue 5):2001 +Amendment :2002 +Amendment2:2003	RSS210(issue 5):2001 +Amendment :2002 +Amendment2:2003	Conducted	N/A	N/A	N/A

3.4 Confirmation

UL ApexCo., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications
FCC Part 15 Subpart C Section 15.207 and 15.247.

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3.5 Uncertainty

Conducted Emission

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

The data listed in this test report has enough margin.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.5\text{dB}(3\text{m})$.

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}(3\text{m})$.

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

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 3.0\text{dB}$.

The data listed in this test report has enough margin.

3.6 Test Location

UL Apex Co., Ltd. Head Office EMC Lab.

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No.1 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on February 01, 2002. (Registration number: No.1:313583 Industry Canada: No.1: IC4247)

No.2 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on June 05, 2002. (Registration number: No.2:846015 Industry Canada: No.2: IC4247-2)

*NVLAP Lab. code: 200572-0

Test room	Width x Depth x Height (m)	Size of reference ground plane(m) / horizontal conducting plane	Size of vertical conducting plane (for Conducted Emission test)	Other rooms
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7m	7.0 x 6.0m	2.0 x 2.0m	Preparation room
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2m	4.0 x 4.0m	2.0 x 2.0m	-
No.3 shielded room	4.7 x 7.5 x 2.7m	4.7 x 7.5m	2.0 x 2.0m	-
No.4 shielded room	3.1 x 5.0 x 2.7m	N/A	N/A	-

3.7 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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SECTION 4: Operation of E.U.T. during testing

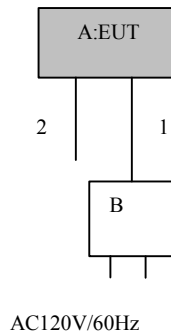
4.1 Operating Modes

The EUT exercise program was used while the testing was performed in a manner similar to typical use.

Test sequence is used: 1. Tx(CH1:2414MHz) mode
2. Tx(CH2:2432MHz) mode
3. Tx(CH4:2468MHz) mode

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

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Digital Wireless Speaker System(Transmitter)	XW-HTD640(T)	000000137 000000135	Pioneer Corporation	EUT *1)
B	AC Adaptor	AWR7006	0305	Pioneer Corporation	-

*1) The EUT(S/N: 000000137) is used for Spurious emission (Radiated), and the EUT (S/N: 000000135) is used for the other tests.

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	DC Power Cable	1.9	N	Polyvinyl chloride
2	Audio Video cable	1.4	N	Polyvinyl chloride

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SECTION 5: Conducted Emission, Section 15.207

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals 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 Line Impedance Stabilization Network (LISN)/Artificial Mains Network (AMN). They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN (AMN) to the input power source. All unused 50ohm connectors of the LISN (AMN) were resistively terminated in 50ohm when not connected to the measuring equipment. The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in the semi Anechoic Chamber. The EUT was connected to a LISN (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a CISPR quasi-peak detector (IF BW 9 kHz). Measurement range: 0.15-30MHz

Test data	:	APPENDIX 3
Test result	:	Pass

SECTION 6: 6dB Bandwidth, Section 15.247(a)(2)

Test Procedure

The minimum 6dB bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data	:	APPENDIX 3
Test result	:	Pass

SECTION 7: Maximum Peak Output Power, Section 15.247(b)(3)

Test Procedure

The Maximum Peak Output Power was measured with a Power Meter connected to the antenna port.

Test data	:	APPENDIX 3
Test result	:	Pass

SECTION 8: Out of Band Emission, Section 15.247 (c)

[Conducted]

Test Procedure

The Out of Band Emission (Conducted) was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

[Radiated]

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The Radiated Electric Field Strength intensity has been measured in the semi anechoic chamber

with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).

The measuring antenna height was varied between 1 to 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 with the Test Receiver or the Spectrum Analyzer.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement. The result also satisfied the general limits specified in section 15.209(a).

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:100kHz

Test data : APPENDIX 3
Test result : Pass

SECTION 9: Peak Power Density, Section 15.247 (d)

[Conducted]

Test Procedure

The Peak Power Density was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

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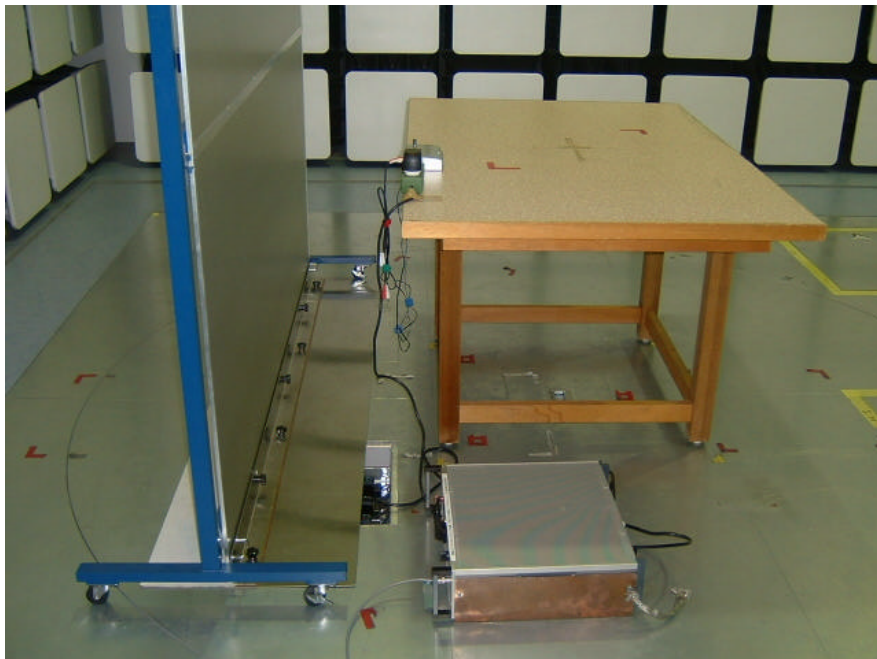
APPENDIX 1: Photographs of test setup

Conducted Emission

Front



Rear



Spurious Emission (Radiated)

Front



Rear



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE	2003/12/27 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2003/11/12 * 12
MCC-05	Microwave Cable	Storm	421-011	RE	2004/01/06 * 12
MCC-23	Microwave Cable	Storm	-	RE	2003/04/30 * 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2004/03/08 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	RE	2003/09/19 * 12
MAT-20	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-110	RE	2004/01/28 * 12
MAT-20	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-110	EX,RE	2004/01/28 * 12
MRENT-06	Spectrum Analyzer	Advantest	R3273	EX,RE	2003/10/31 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	EX,RE	2003/04/11 * 12
MCC-04	Microwave Cable	Storm	421-011	RE	2004/01/06 * 12
MCC-24	Microwave Cable	Storm	-	RE	2003/04/30 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	RE	2003/09/19 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2004/02/06 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2004/01/10 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item

RE: Spurious Emission(Radiated)

EX: Except for RE

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APPENDIX 3: Data of EMI

Conducted emission

DATA OF CONDUCTED EMISSION TEST

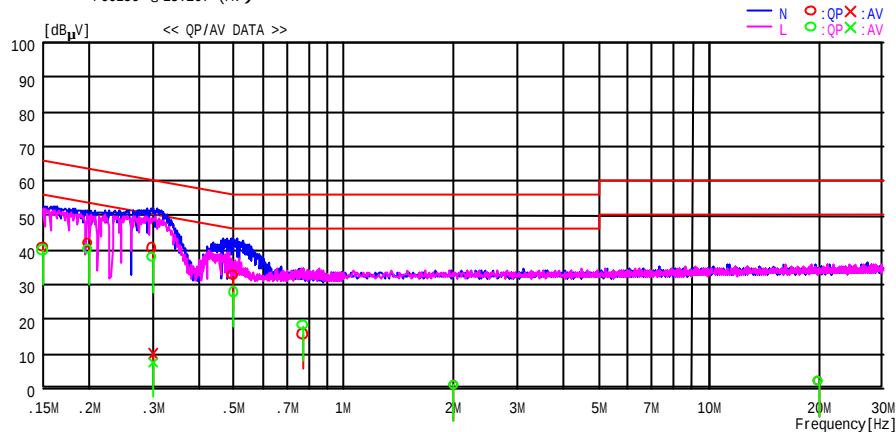
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/31 11:45:48

Applicant : Pioneer Corporation
Kind of EUT : Digital Wireless Speaker
Model No. : XW-HTD640 (T)
Serial No. : 000000137

Report No. : 24GE0288-HO
Power : AC120V / 60Hz
Temp / Humi% : 23 / 36
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting Ch1 2414MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



NO	FREQ [MHz]	READING		C.F	RESULT		LIMIT		MARGIN		PHASE
		QP [dB _μ V]	AV [dB _μ V]		QP [dB _μ V]	AV [dB _μ V]	QP [dB _μ V]	AV [dB _μ V]	QP [dB]	AV [dB]	
1	0.1500	40.8	----	0.1	40.9	----	66.0	----	25.1	----	N
2	0.2000	41.6	----	0.2	41.8	----	63.6	----	21.8	----	N
3	0.2995	40.3	9.8	0.2	40.5	10.0	60.3	50.3	19.8	40.3	N
4	0.4990	32.4	----	0.2	32.6	----	56.0	----	23.4	----	N
5	0.7730	15.4	----	0.3	15.7	----	56.0	----	40.3	----	N
6	2.0000	0.2	----	0.5	0.7	----	56.0	----	55.3	----	N
7	20.0000	0.1	----	1.9	2.0	----	60.0	----	58.0	----	N
8	0.1500	39.9	----	0.1	40.0	----	66.0	----	26.0	----	L
9	0.2000	39.9	----	0.2	40.1	----	63.6	----	23.5	----	L
10	0.2995	37.7	7.4	0.1	37.8	7.5	60.3	50.3	22.5	42.8	L
11	0.4999	27.7	----	0.2	27.9	----	56.0	----	28.1	----	L
12	0.7730	17.9	----	0.3	18.2	----	56.0	----	37.8	----	L
13	2.0000	0.4	----	0.5	0.9	----	56.0	----	55.1	----	L
14	20.0000	0.3	----	1.9	2.2	----	60.0	----	57.8	----	L

CHART:WITHOUT FACTOR,Peak hold data.Data is uncorrected.
Except for the above table : adequate margin data below the limits.

Conducted emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/31 13:02:03

Applicant : Pioneer Corporation
Kind of EUT : Digital Wireless Speaker
Model No. : XW-HTD640(T)
Serial No. : 000000137

Report No. : 24GE0288-HO
Power : AC120V / 60Hz
Temp / Humi% : 23 / 36
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting Ch2 2432MHz

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)

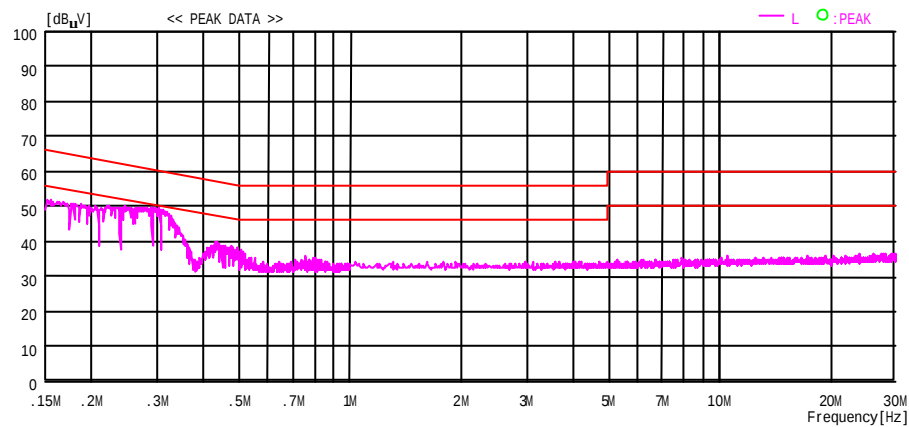
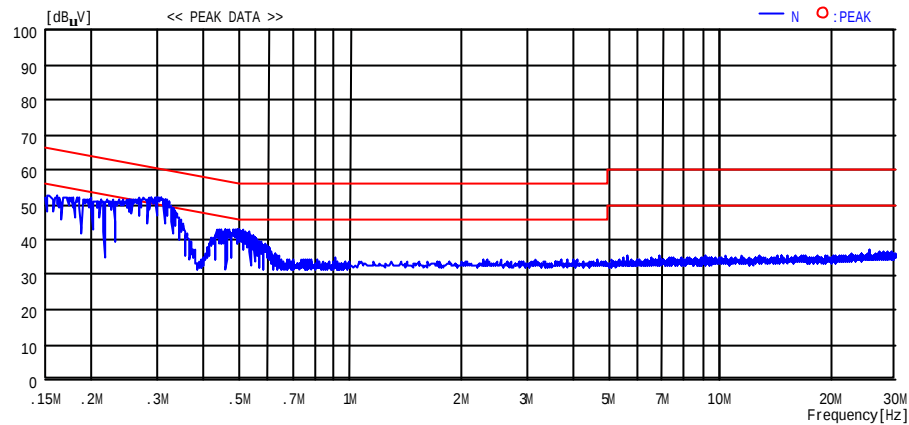


CHART:WITHOUT FACTOR,Peak hold data.Data is uncorrected.
Except for the above table : adequate margin data below the limits.

Conducted emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/31 13:07:29

Applicant : Pioneer Corporation
Kind of EUT : Digital Wireless Speaker
Model No. : XW-HTD640(T)
Serial No. : 000000137

Report No. : 24GE0288-HO
Power : AC120V / 60Hz
Temp / Humi% : 23 / 36
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting Ch4 2468MHz

LIMIT : FCC15C § 15.207 (QP)
FCC15C § 15.207 (AV)

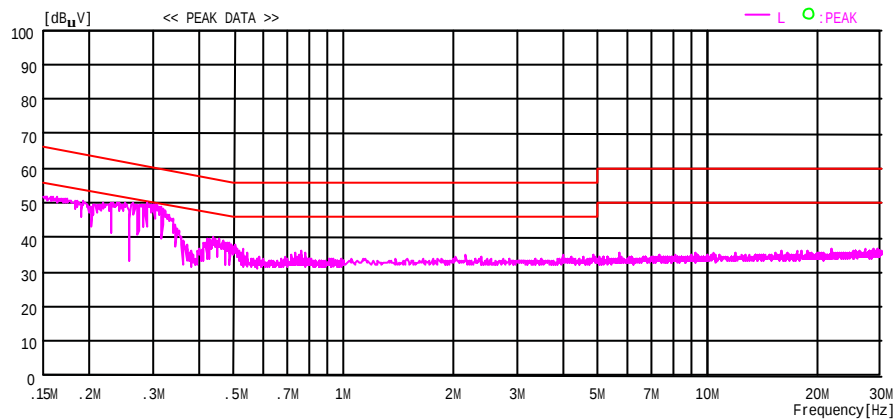
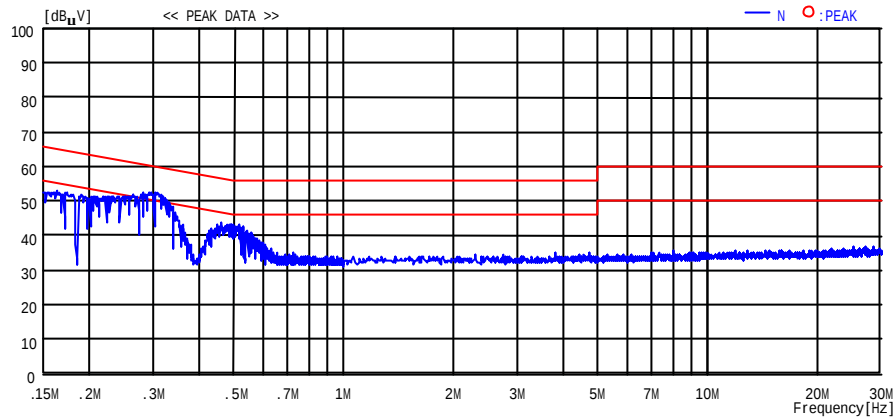


CHART:WITHOUT FACTOR,Peak hold data.Data is uncorrected.
Except for the above table : adequate margin data below the limits.

6dB Bandwidth

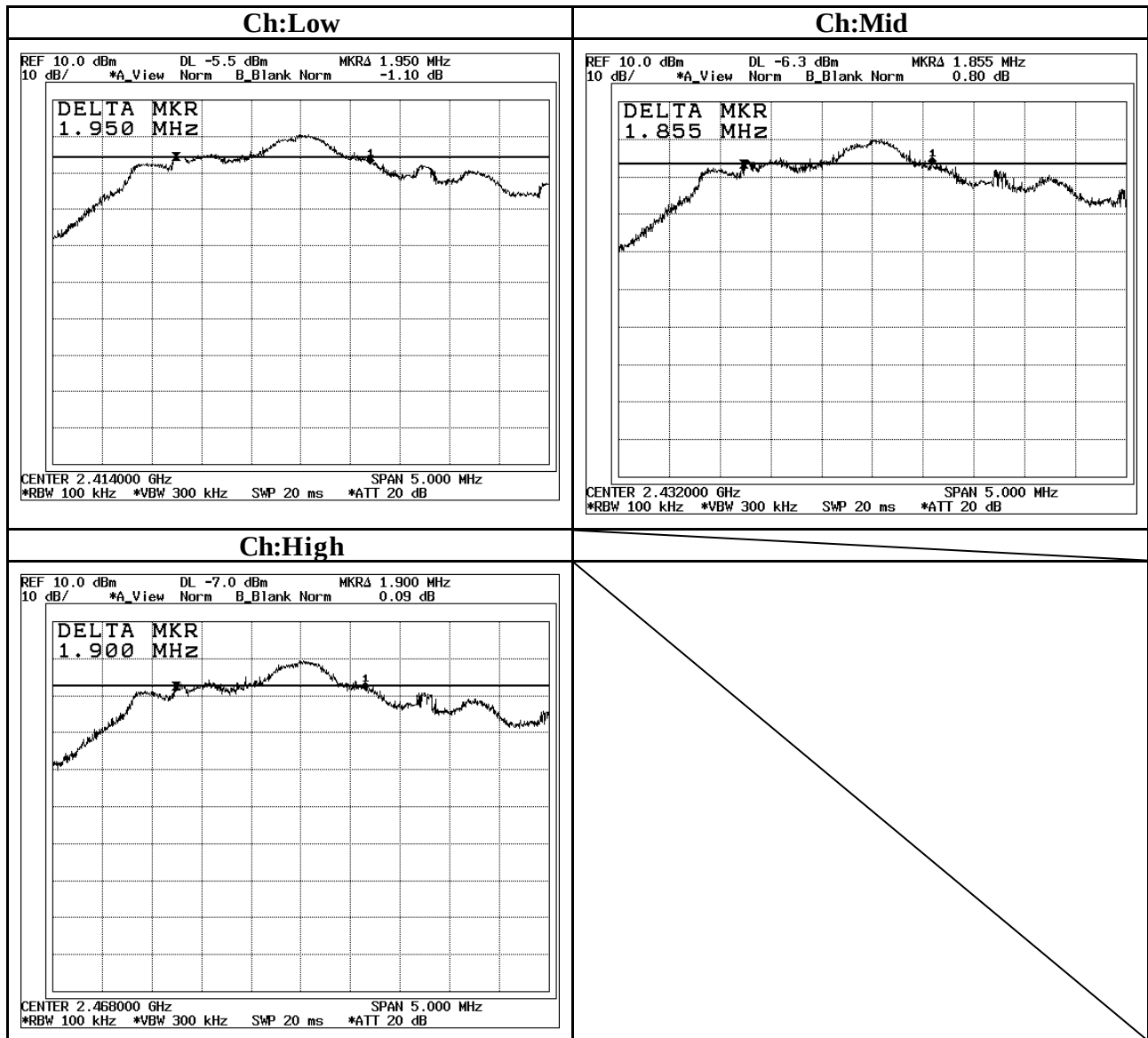
UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : Pioneer Corporation.
Equipment : Digital Wireless Speaker System
Model : XW-HTD640(T)
Sample No. : 000000135
Power : AC120V/60Hz
Mode : Tx

REPORT NO : 24GE0288-HO
REGULATION : FCC Part15 Subpart C 15.247(a)(2)
TEST DISTANCE : -
DATE : 03/30/2004
TEMPERATURE : 22deg.C
HUMIDITY : 53%
ENGINEER : Hiroka Umeyama

Ch	Freq.	6dB Bandwidth	Limit
	[MHz]	[MHz]	[kHz]
Low	2414.0	1.950	500.0
Mid	2432.0	1.855	500.0
High	2468.0	1.900	500.0

6dB Bandwidth



Maximum Peak OutPut Power

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company	: Pioneer Corporation.	REPORT NO	: 24GE0288-HO
Equipment	: Digital Wireless Speaker System	REGULATION	: FCC Part15 Subpart C 15.247(b)(3)
Model	: XW-HTD640(T)	TEST DISTANCE	: -
Sample No.	: 000000135	DATE	: 03/30/2004
Power	: AC120V/60Hz	TEMPERATURE	: 22deg.C
Mode	: Tx	HUMIDITY	: 53%
		ENGINEER	: Hiroka Umeyama

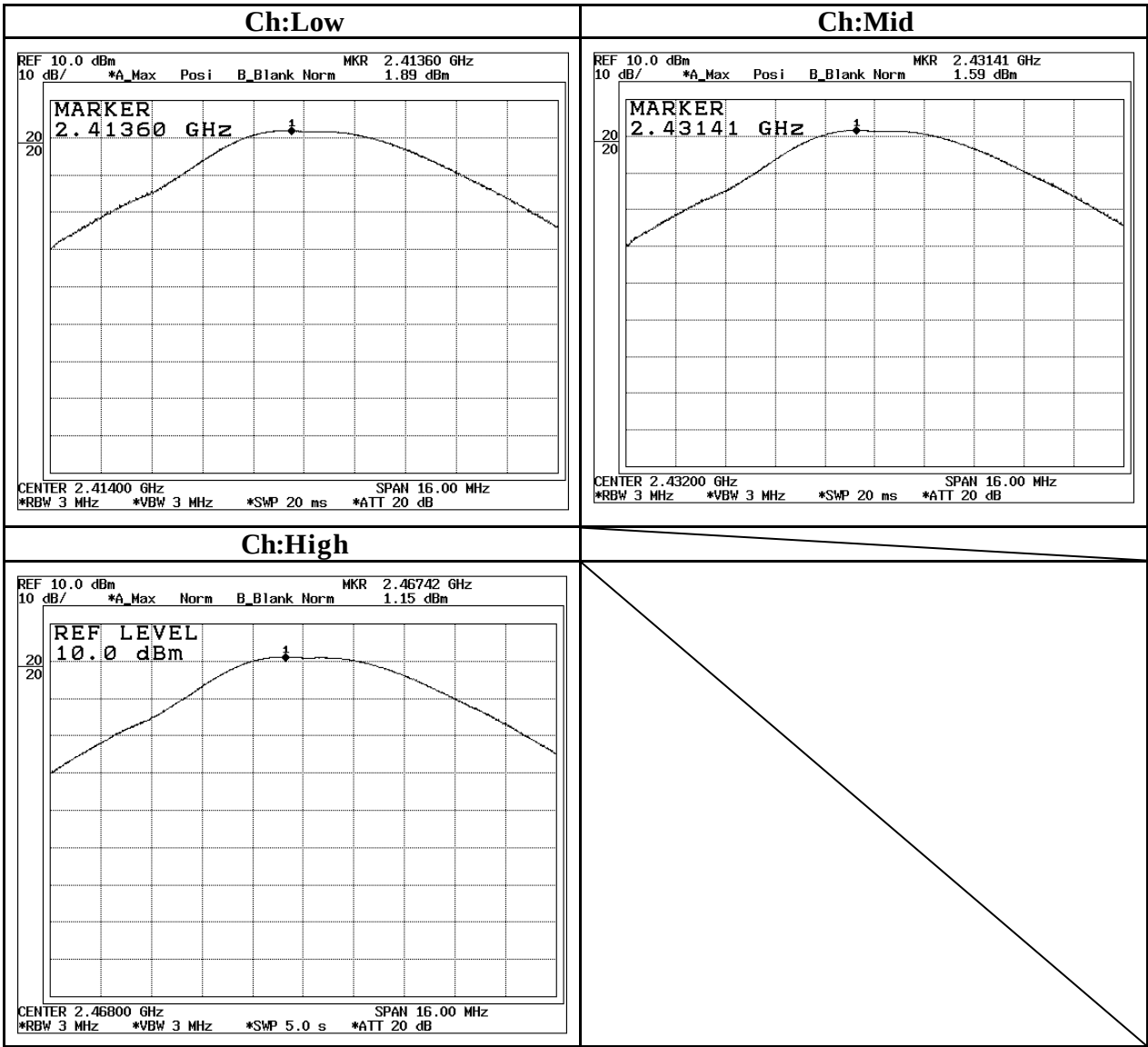
Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2414.0	1.89	0.0	10.0	11.9	30.0	18.1
Mid	2432.0	1.59	0.0	10.0	11.6	30.0	18.4
High	2468.0	1.15	0.0	10.0	11.2	30.0	18.9

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

*Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

Maximum Peak OutPut Power



Radiated Spurious Emission

DATA OF RADIATED EMISSION TEST

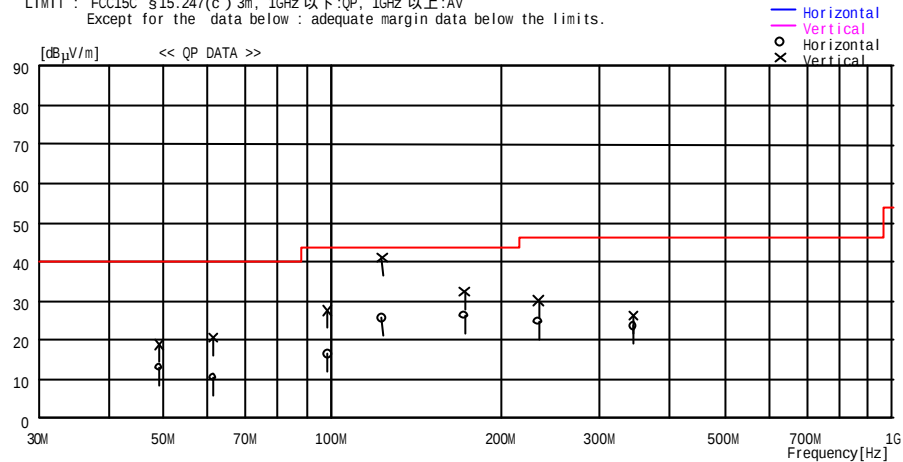
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/03/29 19:30:48

Applicant : Pioneer Corporation
Kind of EUT : Digital Wireless Speaker System
Model No. : XW-HTD640(T)
Serial No. : 000000137

Report No. : 24GE0288-HO
Power : AC 120V / 60Hz
Temp /Humi% : 23 / 38
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting (Ch1:2414MHz)

LIMIT : FCC15C §15.247(c) 3m, 1GHz 以下:QP, 1GHz 以上:AV
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dB μ V]	ANT FACTOR [dB/m]	LOSS	GAIN	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE
----- Horizontal -----										
1	49.135	22.7	10.5	7.2	27.4	13.0	40.0	27.0	220	353
2	61.437	22.5	7.9	7.4	27.4	10.4	40.0	29.6	170	0
3	98.305	25.9	9.8	8.0	27.3	16.4	43.5	27.1	205	272
4	122.879	31.7	13.2	8.1	27.3	25.7	43.5	17.8	137	253
5	172.034	29.0	15.8	8.7	27.2	26.3	43.5	17.2	184	264
6	233.471	25.2	17.3	9.3	27.1	24.7	46.0	21.3	137	1
7	344.072	24.6	16.0	10.2	27.3	23.5	46.0	22.5	100	285
----- Vertical -----										
8	49.135	28.6	10.5	7.2	27.4	18.9	40.0	21.1	100	82
9	61.437	32.8	7.9	7.4	27.4	20.7	40.0	19.3	100	173
10	98.305	37.0	9.8	8.0	27.3	27.5	43.5	16.0	100	41
11	122.879	47.0	13.2	8.1	27.3	41.0	43.5	2.5	100	138
12	172.034	35.1	15.8	8.7	27.2	32.4	43.5	11.1	100	175
13	233.481	30.6	17.3	9.3	27.1	30.1	46.0	15.9	100	166
14	344.072	27.4	16.0	10.2	27.3	26.3	46.0	19.7	100	145

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN

Page:

Radiated Spurious Emission

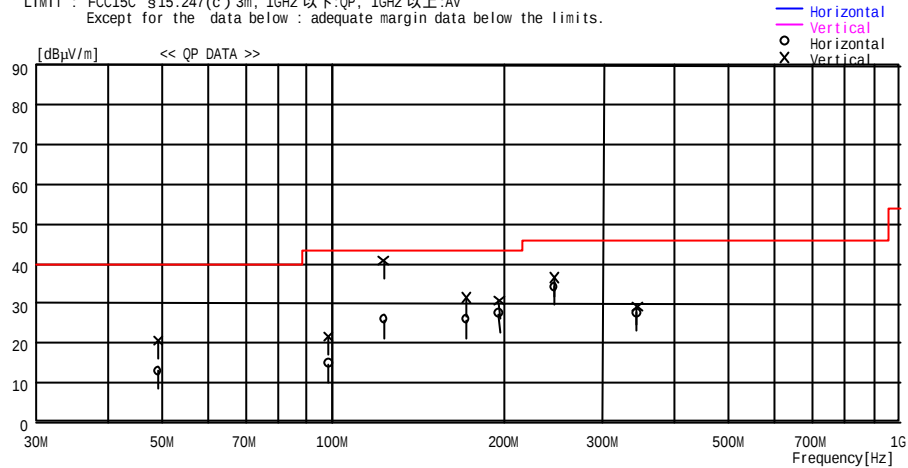
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/03/29 20:46:12

Applicant : Pioneer Corporation
Kind of EUT : Digital Wireless Speaker System
Model No. : XW-HTD640(T)
Serial No. : 000000137
Report No. : 24GE0288-HO
Power : AC 120V / 60Hz
Temp /Humi% : 23 / 38
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting (Ch2:2432MHz)

LIMIT : FCC15C S15.247(c) 3m, 1GHz 以下:QP, 1GHz 以上:AV
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	49.153	22.6	10.5	7.2	27.4	12.9	40.0	27.1	233	103
2	98.301	24.3	9.8	8.0	27.3	14.8	43.5	28.7	162	157
3	122.880	31.9	13.2	8.1	27.3	25.9	43.5	17.6	138	251
4	172.035	28.6	15.8	8.7	27.2	25.9	43.5	17.6	190	266
5	196.612	28.4	16.8	9.3	27.1	27.4	43.5	16.1	157	116
6	245.769	34.3	17.4	9.4	27.0	34.1	46.0	11.9	127	276
7	344.072	28.6	16.0	10.2	27.3	27.5	46.0	18.5	100	330

----- Vertical -----										
8	49.153	30.3	10.5	7.2	27.4	20.6	40.0	19.4	100	217
9	98.301	31.2	9.8	8.0	27.3	21.7	43.5	21.8	100	164
10	122.879	46.7	13.2	8.1	27.3	40.7	43.5	2.8	100	143
11	172.035	34.1	15.8	8.7	27.2	31.4	43.5	12.1	100	150
12	196.612	31.6	16.8	9.3	27.1	30.6	43.5	12.9	100	127
13	245.768	36.8	17.4	9.4	27.0	36.6	46.0	9.4	100	178
14	344.072	30.3	16.0	10.2	27.3	29.2	46.0	16.8	100	215

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

Radiated Spurious Emission

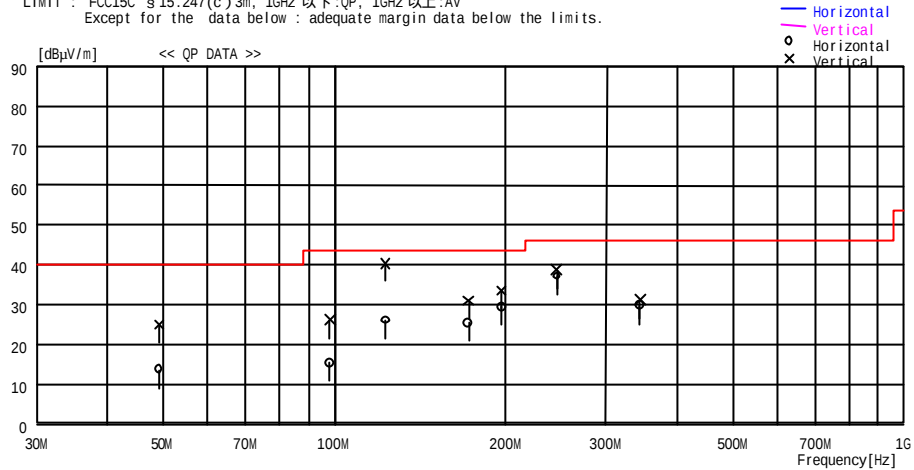
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/03/29 20:54:46

Applicant : Pioneer Corporation
Kind of EUT : Digital Wireless Speaker System
Model No. : XW-HTD640(T)
Serial No. : 000000137
Report No. : 24GE0288-HO
Power : AC 120V / 60Hz
Temp / Humi% : 23 / 38
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting (Ch4:2468MHz)

LIMIT : FCC15C §15.247(c) 3m, 1GHz 以下:QP, 1GHz 以上:AV
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	49.156	23.4	10.5	7.2	27.4	13.7	40.0	26.3	311	199
2	98.306	24.9	9.8	8.0	27.3	15.4	43.5	28.1	195	121
3	122.879	32.0	13.2	8.1	27.3	26.0	43.5	17.5	155	243
4	172.035	28.2	15.8	8.7	27.2	25.5	43.5	18.0	203	257
5	196.611	30.5	16.8	9.3	27.1	29.5	43.5	14.0	174	125
6	245.765	37.4	17.4	9.4	27.0	37.2	46.0	8.8	135	274
7	344.077	30.8	16.0	10.2	27.3	29.7	46.0	16.3	100	329
----- Vertical -----										
8	49.156	34.9	10.5	7.2	27.4	25.2	40.0	14.8	100	202
9	98.306	35.8	9.8	8.0	27.3	26.3	43.5	17.2	100	241
10	122.879	46.4	13.2	8.1	27.3	40.4	43.5	3.1	100	157
11	172.038	33.8	15.8	8.7	27.2	31.1	43.5	12.4	100	157
12	196.611	34.6	16.8	9.3	27.1	33.6	43.5	9.9	100	76
13	245.765	39.0	17.4	9.4	27.0	38.8	46.0	7.2	100	186
14	344.077	32.4	16.0	10.2	27.3	31.3	46.0	14.7	100	227

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

Radiated Spurious Emission

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : Pioneer Corporation.
EQUIPMENT : Digital Wireless Speaker System
MODEL : XW-HTD640(T)
S/ N : 000000137
POWER : A43AC120V / 60Hz
MODE : Transmitting(Ch1: 2414MHz)
AXIS : normal installation

REPORT NO : 24GE0288-HO
REGULATION : FCC Part15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1 m
DATE : 3/31/2004
TEMPERATURE : 23deg.C
HUMIDITY : 57%
ENGINEER : Makoto Kosaka, Hiroka Umeyama

PK DETECT(RBW & VBW 1MHz SWP AUTO)

No.	FREQ [MHz]	S/A READING HOR VER [dBuV/m]		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB/m]	Band-Pass Filter [dB]	RESULT HOR VER [dBuV/m]		Limit PK [dBuV/m]	MARGIN HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amn Gain + CABLE LOSS + Band Pass												
1	2390.0	43.1	44.6	30.8	36.3	6.2	10.0	53.8	55.3	74.0	20.2	18.7
2	4828.0	44.9	49.1	35.4	36.1	9.0	1.0	54.2	58.4	74.0	19.8	15.6
3	7240.7	41.8	44.2	38.0	35.6	11.2	0.5	55.9	58.3	74.0	18.1	15.7
4	9654.6	41.5	42.4	37.5	36.3	12.9	0.5	56.1	57.0	74.0	17.9	17.0
Test distance 1meters RESULT=Reading + ANT Factor - Amn Gain + CABLE LOSS + Band Pass - Dfac)												
5	12066.2	42.9	40.3	41.2	35.7	14.4	0.5	53.8	51.2	74.0	20.2	22.8
6	14480.6	41.1	43.7	41.0	34.6	15.4	0.6	54.0	56.6	74.0	20.0	17.4
7	16895.0	43.1	43.6	46.1	35.5	17.3	0.4	61.9	62.4	74.0	12.1	11.6
8	19312.0	42.2	42.3	39.5	34.9	18.7	0.9	56.9	57.0	74.0	17.1	17.0
9	21726.0	42.0	42.2	40.7	35.3	20.1	0.7	58.7	58.9	74.0	15.3	15.1
10	24140.0	41.9	42.1	40.0	36.1	20.6	1.7	58.6	58.8	74.0	15.4	15.2

AV DETECT(RBW 1MHz VBW 10Hz SWP AUTO)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB/m]	Band-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV/m]						[dB]				
Test distance 3meters RESULT=Reading + ANT Factor - Amn Gain + CABLE LOSS + Band Pass												
1	2390.0	31.0	31.2	30.8	36.3	6.2	10.0	41.7	41.9	54.0	12.3	12.1
2	4828.0	34.2	42.2	35.4	36.1	9.0	1.0	43.5	51.5	54.0	10.5	2.5
3	7240.7	30.4	32.2	38.0	35.6	11.2	0.5	44.5	46.3	54.0	9.5	7.7
4	9654.6	30.6	30.8	37.5	36.3	12.9	0.5	45.2	45.4	54.0	8.8	8.6
Test distance 1meters RESULT=Reading + ANT Factor - Amn Gain + CABLE LOSS + Band Pass - Dfac)												
5	12066.2	29.6	29.5	41.2	35.7	14.4	0.5	40.5	40.4	54.0	13.5	13.6
6	14480.6	29.3	29.4	41.0	34.6	15.4	0.6	42.2	42.3	54.0	11.8	11.7
7	16895.0	30.1	30.1	46.1	35.5	17.3	0.4	48.9	48.9	54.0	5.1	5.1
8	19312.0	30.7	30.6	39.5	34.9	18.7	0.9	45.4	45.3	54.0	8.6	8.7
9	21726.0	30.0	30.2	40.7	35.3	20.1	0.7	46.7	46.9	54.0	7.3	7.1
10	24140.0	29.6	29.7	40.0	36.1	20.6	1.7	46.3	46.4	54.0	7.7	7.6

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*The equipment and cables were not used for factor 0.0dB of the above table.

*Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

Radiated Spurious Emission

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : Pioneer Corporation.
EQUIPMENT : Digital Wireless Speaker System
MODEL : XW-HTD640(T)
S/N : 000000137
POWER : AC120V / 60Hz
MODE : Transmitting(Ch2: 2432MHz)
AXIS : normal installation

REPORT NO : 24GE0288-HO
REGULATION : FCC Part15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1 m
DATE : 3/31/2004
TEMPERATURE : 23deg.C
HUMIDITY : 57%
ENGINEER : Makoto Kosaka, Hiroka Umeyama

PK DETECT(RBW & VBW 1MHz SWP AUTO)

No.	FREQ [MHz]	S/A READING HOR VER [dBuV/m]		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB/m]	Band-Pass Filter [dB]	RESULT HOR VER [dBuV/m]		Limit PK [dBuV/m]	MARGIN HOR VER [dB]	
		Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass										
2	4862.7	45.6	48.6	35.6	36.1	9.1	1.0	55.2	58.2	74.0	18.8	15.8
3	7294.7	42.7	45.1	38.1	35.7	11.2	0.5	56.8	59.2	74.0	17.2	14.8
4	9726.6	41.3	42.3	37.3	36.3	13.0	0.5	55.8	56.8	74.0	18.2	17.2
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac)												
5	12156.6	41.1	41.1	41.4	35.5	14.5	0.5	52.5	52.5	74.0	21.5	21.5
6	14589.5	42.3	42.2	41.4	34.7	15.4	0.6	55.5	55.4	74.0	18.5	18.6
7	17020.4	44.5	44.7	46.3	35.4	17.4	0.4	63.7	63.9	74.0	10.3	10.1
8	19456.0	42.1	42.9	39.3	34.9	18.9	1.0	56.9	57.7	74.0	17.1	16.3
9	21888.0	41.8	42.1	40.5	35.1	20.1	0.9	58.7	59.0	74.0	15.3	15.0
10	24320.0	42.4	43.0	40.1	36.5	20.7	2.1	59.3	59.9	74.0	14.7	14.1

AV DETECT(RBW 1MHz VBW 10Hz SWP AUTO)

No.	FREQ [MHz]	S/A READING HOR VER [dBuV/m]		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB/m]	Band-Pass Filter [dB]	RESULT HOR VER [dBuV/m]		Limit AV [dBuV/m]	MARGIN HOR VER [dB]	
		Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass										
2	4862.7	34.9	41.8	35.6	36.1	9.1	1.0	44.5	51.4	54.0	9.5	2.6
3	7294.7	30.5	33.8	38.1	35.7	11.2	0.5	44.6	47.9	54.0	9.4	6.1
4	9726.6	30.4	31.2	37.3	36.3	13.0	0.5	44.9	45.7	54.0	9.1	8.3
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac)												
5	12156.6	29.6	29.6	41.4	35.5	14.5	0.5	41.0	41.0	54.0	13.0	13.0
6	14589.5	29.1	29.1	41.4	34.7	15.4	0.6	42.3	42.3	54.0	11.7	11.7
7	17020.4	29.8	29.7	46.3	35.4	17.4	0.4	49.0	48.9	54.0	5.0	5.1
8	19456.0	30.8	30.8	39.3	34.9	18.9	1.0	45.6	45.6	54.0	8.4	8.4
9	21888.0	29.8	29.9	40.5	35.1	20.1	0.9	46.7	46.8	54.0	7.3	7.2
10	24320.0	29.3	29.4	40.1	36.5	20.7	2.1	46.2	46.3	54.0	7.8	7.7

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*The equipment and cables were not used for factor 0.0dB of the above table.

*Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

Radiated Spurious Emission

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : Pioneer Corporation.
EQUIPMENT : Digital Wireless Speaker System
MODEL : XW-HTD640(T)
S/ N : 000000137
POWER : AC120V / 60Hz
MODE : Transmitting(Ch4: 2468MHz)
AXIS : normal installation

REPORT NO : 24GE0288-HO
REGULATION : FCC Part15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1 m
DATE : 3/31/2004
TEMPERATURE : 23deg.C
HUMIDITY : 57%
ENGINEER : Makoto Kosaka , Hiroka Umeyama

PK DETECT(RBW & VBW 1MHz SWP AUTO)

KDE1000BW & VIEW1MHSW1R0107													
No.	FREQ [MHz]	S/A READING HOR VER [dBuV/m]		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB/m]	Band-Pass Filter [dB]	RESULT HOR VER [dBuV/m]		Limit PK [dBuV/m]	MARGIN HOR VER [dB]		
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass													
1	2483.5	43.9	42.3	31.0	36.2	6.3	10.0	55.0	53.4	74.0	19.0	20.6	
2	4936.0	46.2	48.3	36.0	36.1	9.2	1.0	56.3	58.4	74.0	17.7	15.6	
3	7402.7	41.9	44.2	38.4	35.7	11.3	0.5	56.4	58.7	74.0	17.6	15.3	
4	9870.7	41.9	43.0	37.1	36.3	13.0	0.5	56.2	57.3	74.0	17.8	16.7	
Test distance 1meters RESULT=T=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac)													
5	12340.0	41.7	40.9	41.7	35.5	14.5	0.4	53.3	52.5	74.0	20.7	21.5	
6	14808.0	42.4	42.1	42.3	35.0	15.7	0.6	56.5	56.2	74.0	17.5	17.8	
7	17276.0	42.1	42.0	46.8	35.3	17.5	0.3	61.9	61.8	74.0	12.1	12.2	
8	19744.0	42.9	43.0	39.7	35.5	19.0	1.1	57.7	57.8	74.0	16.4	16.3	
9	22212.0	42.7	41.8	40.6	35.0	20.2	1.6	60.6	59.7	74.0	13.4	14.3	
10	24680.0	42.9	43.1	40.2	36.7	20.9	2.7	60.5	60.7	74.0	13.5	13.3	

AV DETECT(RBW 1MHz VBW 10Hz SWP AUTO)

AV DETECTOR (H3BW 1MHz V3BW 1MHz SWP 40dB)												
No.	FREQ [MHz]	S/A READING HOR VER [dBuV/m]		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB/m]	Band-Pass Filter [dB]	RESULT HOR VER [dBuV/m]		Limit AV [dBuV/m]	MARGIN HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	2483.5	31.0	31.5	31.0	36.2	6.3	10.0	42.1	42.6	54.0	11.9	11.4
2	4936.0	36.7	42.7	36.0	36.1	9.2	1.0	46.8	52.8	54.0	7.2	1.2
3	7402.7	30.5	34.5	38.4	35.7	11.3	0.5	45.0	49.0	54.0	9.0	5.0
4	9870.7	31.0	32.2	37.1	36.3	13.0	0.5	45.3	46.5	54.0	8.7	7.5
Test distance 1meters RESULT=T=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac)												
5	12340.0	29.9	29.3	41.7	35.5	14.5	0.4	41.5	40.9	54.0	12.5	13.1
6	14808.0	28.9	29.1	42.3	35.0	15.7	0.6	43.0	43.2	54.0	11.0	10.8
7	17276.0	27.9	28.0	46.8	35.3	17.5	0.3	47.7	47.8	54.0	6.3	6.2
8	19744.0	29.2	29.5	39.7	35.5	19.0	1.1	44.0	44.3	54.0	10.1	9.8
9	22212.0	29.4	29.5	40.6	35.0	20.2	1.6	47.3	47.4	54.0	6.7	6.6
10	24680.0	29.4	29.3	40.2	36.7	20.9	2.7	47.0	46.9	54.0	7.0	7.1

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

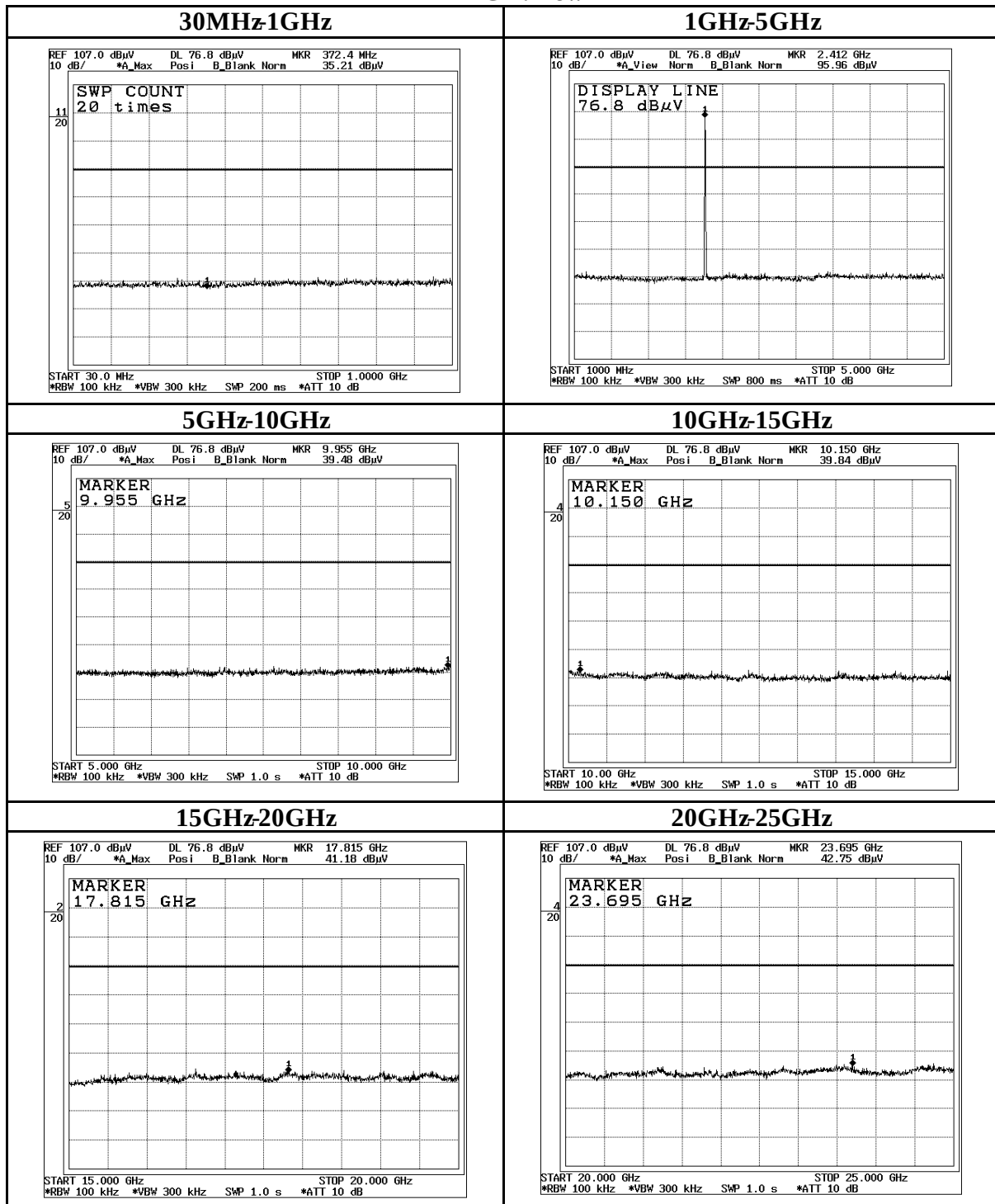
*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*The equipment and cables were not used for factor 0.0dB of the above table.

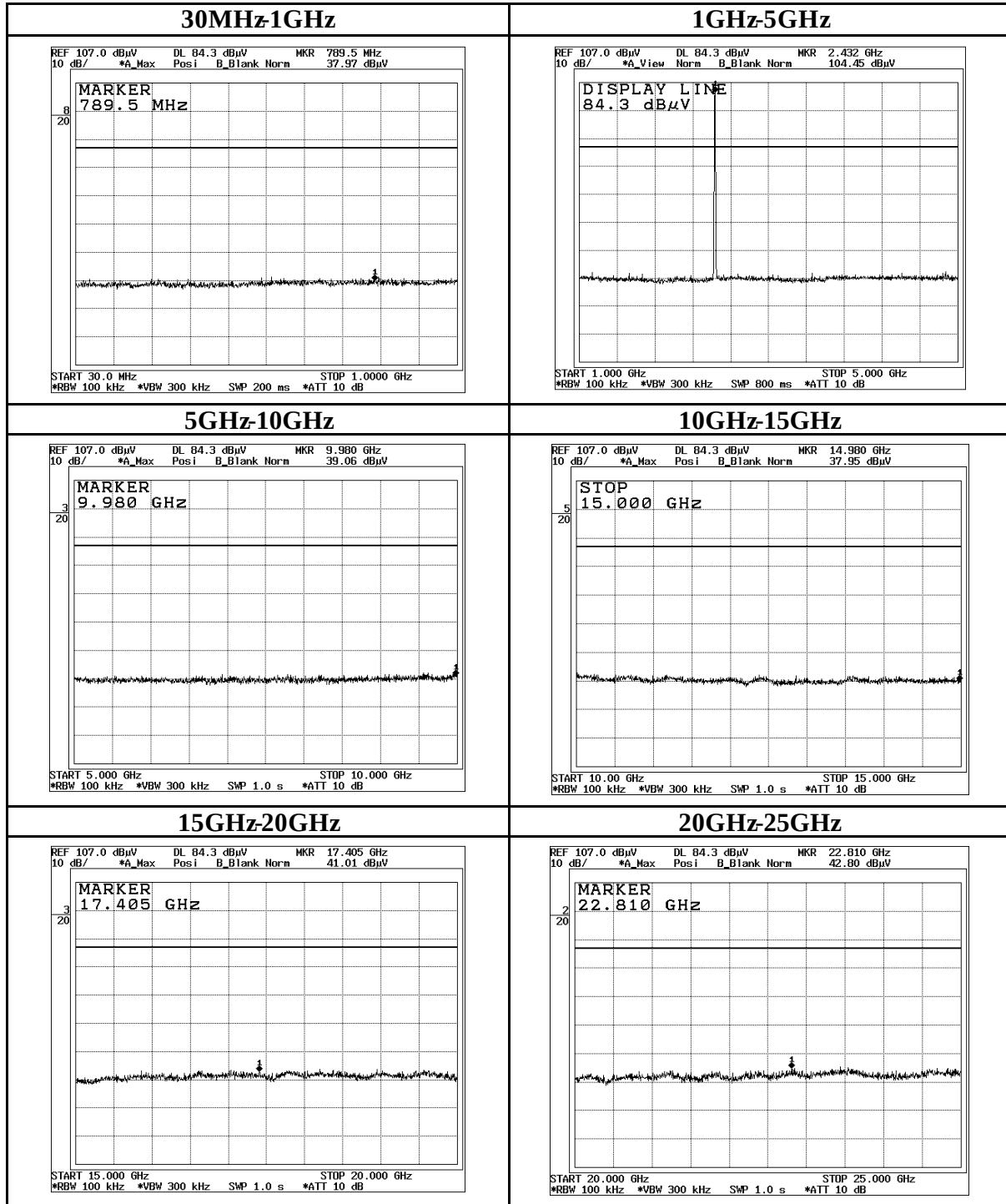
*Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

Conducted Spurious Emission

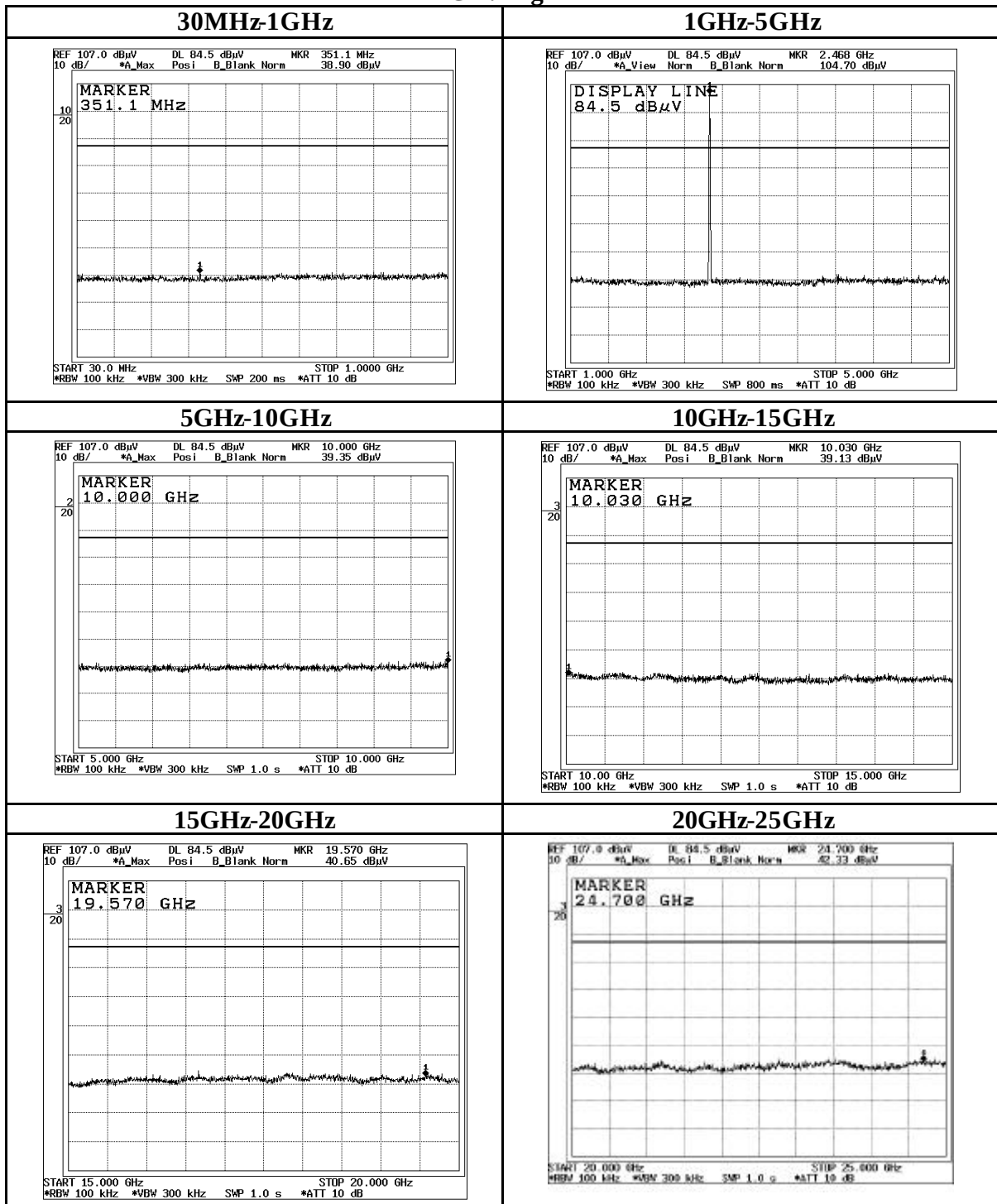
Ch : Low



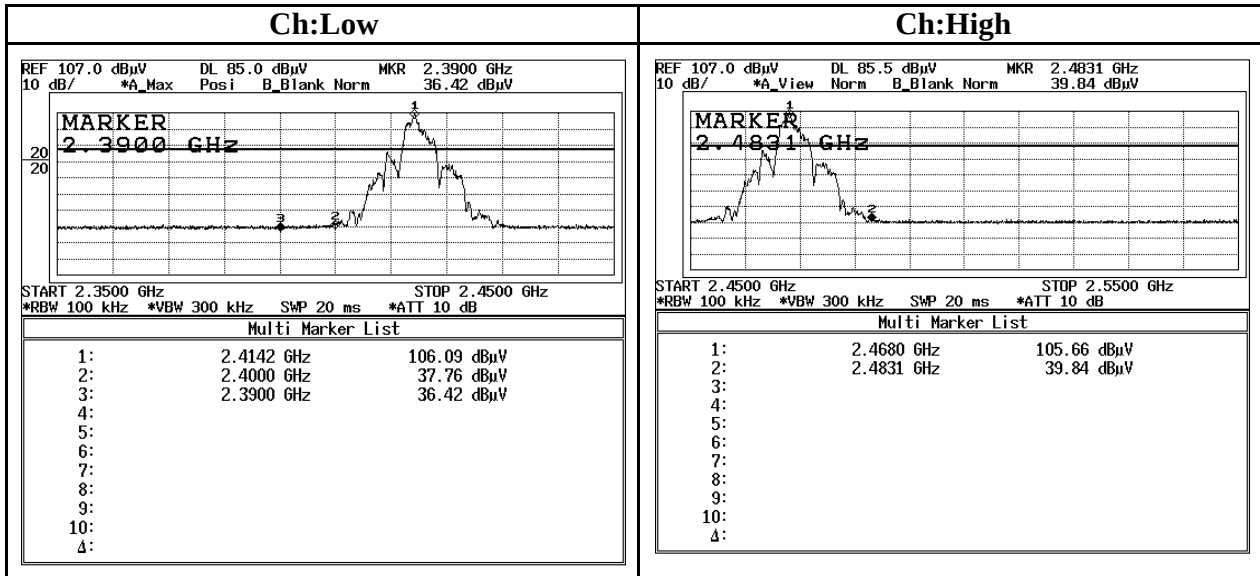
Conducted Spurious Emission
Ch : Mid



Conducted Spurious Emission
Ch : High



Conducted emission Band Edge compliance



Power Density

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company	: Pioneer Corporation.	REPORT NO	: 24GE0288-HO
Equipment	: Digital Wireless Speaker System	REGULATION	: FCC Part15 Subpart C 15.247(d)
Model	: XW-HTD640(T)	TEST DISTANCE	: -
Sample No.	: 000000135	DATE	: 03/30/2004
Power	: AC120V/60Hz	TEMPERATURE	: 22deg.C
Mode	: Tx	HUMIDITY	: 53%
		ENGINEER	: Hiroka Umeyama

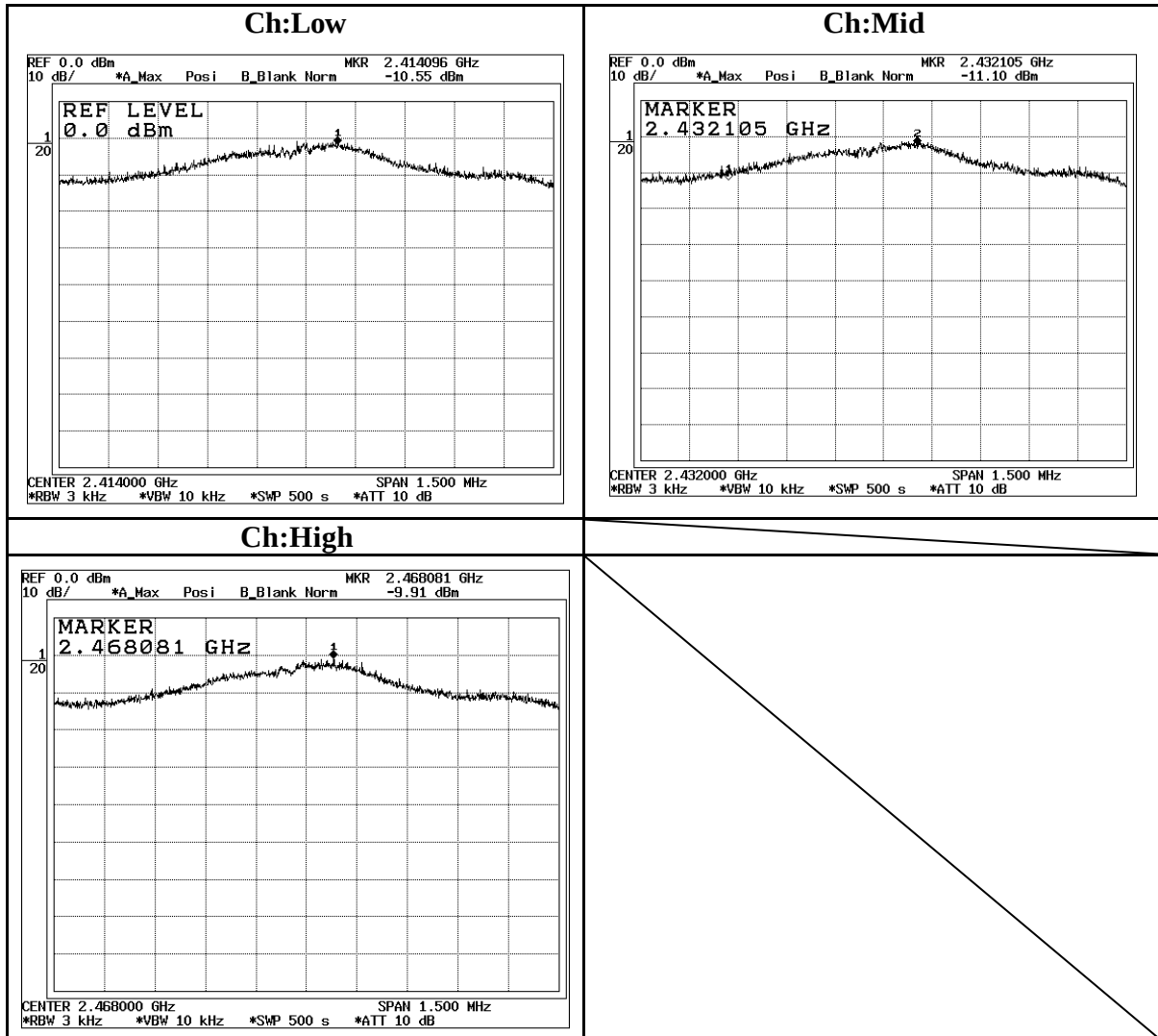
Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low	2414.0	-10.55	0.0	10.0	-0.6	8.0	8.6
Mid	2432.0	-11.10	0.0	10.0	-1.1	8.0	9.1
High	2468.0	-9.91	0.0	10.0	0.1	8.0	7.9

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

*Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

Power Density



99%Occupied Bandwidth

