RADIO TEST REPORT

Test Report No.: 31JE0259-SH-01-A

Applicant	:	**PIONEER CORPORATION**
Type of Equipment	:	**CD RECEIVER**
Model No.	:	**CVX-2318**
FCC ID	:	**AJDK046**
Test regulation	:	**FCC Part15 Subpart C: 2010**
Test result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: July 20 to 25, 2011

Tested by:
Hikaru Shirasawa
Engineer of WiSE Japan,
UL Verification Service

Approved by :
Ichiro Isozaki
Leader of WiSE Japan,
UL Verification Service

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

JAB Testing RTL02610

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

Contents

SECTION 1: Customer information

Company Name	:	PIONEER CORPORATION
Brand Name	:	Pioneer
Address	:	25-1 Nishi-machi, Yamada-aza, Kawagoe-shi, Saitama, 350-8555, JAPAN
Telephone Number	:	+81-49-228-6415
Facsimile Number	:	+81-49-228-6493
Contact Person	:	Makoto Kaieda

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	CD RECEIVER
Model Number	:	CVX-2318
Serial Number	:	Refer to Section 4.2
Rating	:	DC 12V
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	:	July 19, 2011
Modification of EUT	:	The test lab did not make the modification to the EUT supplied from the customer to have it pass the tests.

2.2 Product description

Model: CVX-2318 (referred to as the EUT in this report) is a CD RECEIVER.

Clock Frequency:
[Main Unit]
Bluetooth Module: 25.8048MHz, 26MHz,
Source u-COM: 16MHz , Host u-COM: 16MHz , Media u-COM: 12MHz, Graphic u-COM: 33MHz
[Display Block]
LCD Controller IC: 32MHz, 9.429MHz, Display u-COM: 4.718592MHz,
[Panel Block]
Panel u-COM: 9.83MHz , Clock IC: 32.768kHz , Key Scan IC: 38kHz , Power Circuit: 350kHz, 311.5kHz
<Radio part>

Equipment type	:	Transceiver
Frequency of operation	:	2402-2480.0MHz
Bandwidth & channel spacing	:	79MHz & 1MHz
Type of modulation	:	GFSK, π/4DQPSK, 8DPSK
Antenna type	:	Ceramic Patch Antenna
Antenna gain with cable loss	:	2.0dBi (max)
Antenna connector type	:	U.FL
ITU code	:	F1D, G1D
Operation temperature range	:	-30 to +85 deg.C.

FCC 15.31 (e)
The equipment provides the Bluetooth transmitter with stable power supply (DC3.3V) ,therefore, the equipment complies with the requirement.

FCC Part 15.203
The equipment and its antenna comply with this requirement since this antenna is built in the equipment and it cannot be replaced by end users.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2010, final revised on December 6, 2010 and effective January 5, 2011.

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC Section 15.207	-	N/A *1)	-	N/A *1)
Carrier frequency separation	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A	*See data.	Complied
20dB bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A		Complied
Number of hopping frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum peak output power	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (b)(1)	Conducted	N/A		Complied
Band edge compliance & Spurious emission	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (d) Section15.209	Conducted/ Radiated	N/A	(Tx) 6.1dB (960.000MHz, Horizontal, Tx 2441MHz, 3DH5)	Complied *2)

Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422
*1) The test is not applicable since the EUT has no AC mains.
*2) No spurious noise was detected at the frequency range of 9kHz to 30MHz.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators, RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	N/A *1)
Note: UL Japan's EMI Work Procedures No.QPM05 and QPM15.					

* Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Item	Frequency range	No.1 SAC*1/SR*2 (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.3 dB	2.7 dB	3.4 dB
	30MHz-300MHz	4.7 dB	4.5 dB	4.7 dB
	300MHz-1GHz	4.5 dB	4.6 dB	4.6 dB
	1GHz-13GHz	3.9 dB	3.9 dB	4.0 dB
Radiated emission (Measurement distance: 1m)	13GHz-18GHz	4.8 dB	4.8 dB	4.8 dB
	18GHz-40GHz	4.4 dB	4.2 dB	4.2 dB

*1: SAC=Semi-Anechoic Chamber
*2: SR= Shielded Room is applied besides radiated emission

Radiated emission test

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

Antenna port conducted test

Power Measurement uncertainty above 1GHz for this test was: (±) 1.3dB
Conducted emissions Measurement (below 1GHz) uncertainty for this test was: (±) 1.9dB
Conducted emissions Measurement (1G-3GHz) uncertainty for this test was: (±) 2.5dB
Conducted emissions Measurement (3G-18GHz) uncertainty for this test was: (±) 3.8dB
Conducted emissions Measurement (18G-26.5GHz) uncertainty for this test was: (±) 4.1dB
Bandwidth Measurement uncertainty for this test was: (±) 5.4%

3.5 Test location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
☐ No.1 Semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☐ No.2 Semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.3 Semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 Full-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☐ No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☒ No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

3.6 Test setup, Data of EMI & Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

Test item	Operating mode	Tested frequency
Carrier frequency separation	Transmitting Hopping ON (DH5/3DH5)/Inquiry, Payload: PRBS9	-
20dB bandwidth	Transmitting Hopping OFF (DH5/3DH5)/Inquiry, Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON (DH5/3DH5)/Inquiry, Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON), Payload: PRBS9 -DH1, -DH3, -DH5 -3DH1, -3DH3, -3DH5	-
	-Inquiry	
Maximum peak output power	Transmitting (Hopping OFF), Payload: PRBS9 -DH5, -2DH5, -3DH5	2402MHz, 2441MHz, 2480MHz
Band edge compliance & Spurious emission (Conducted)	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	Band edge compliance: 2402MHz, 2480MHz Spurious emission: 2402MHz, 2441MHz, 2480MHz
(Radiated)	Transmitting (DH5/3DH5), Payload: PRBS9	
99% occupied bandwidth	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping ON -Hopping OFF	2402MHz, 2441MHz, 2480MHz

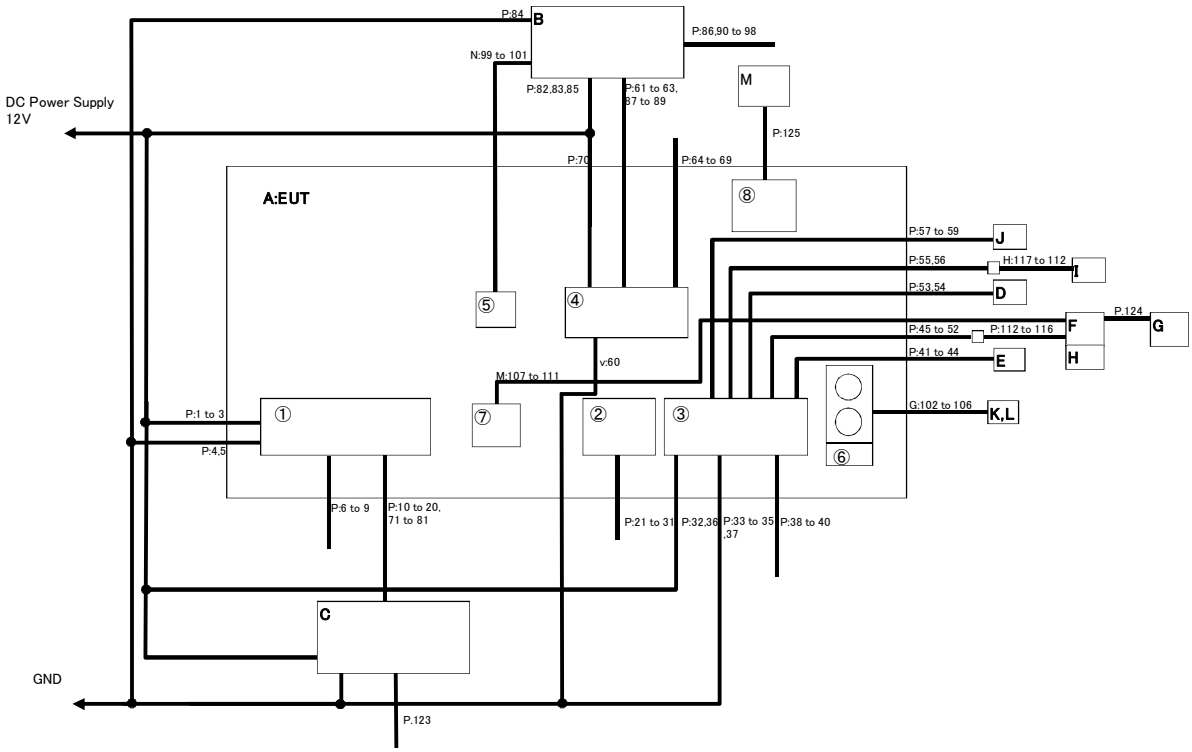
*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload (except Dwell time test).

*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.
However, the limit level 125mWof AFH mode was used for the test.

*EUT has the power settings by the software as follows;
Power settings: Fixed (The setting is not controlled by the software and it is equivalent to that of mass-produced items.)
Software: HCITester (Version: 2.0.99)

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

4.2 Configuration of tested system



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	CD RECEIVER	CVX-2318	KEPKTP0005US *1) KEPKTP0036US *2)	PIONEER	EUT
B	Display	AVX-2818	KEPKTP0021WL	SUMITOMO ELECTRIC	-
C	Amplifier	GM-4128	TPJP990079WL	PIONEER	-
D	Remote Control Device	-	-	DENSO	-
E	microphone	-	-	KOJIMA PRESS	-
F	USB/AUX BOX	-	-	-	-
G	Digital Audio Player	GH-KANAGT-1GR	R0004/4794	GREEN HOUSE	-
H	USB Memory	SDK-USM4GL(B)	-	SONY	-
I	Air-Conditioning ECU	-	-	DENSO	-
J	steering switch	PBT-GF15	-	TOKAI RIKA	-
K	75ohm termination	-	-	-	-
L	75ohm termination	T1221C	-	STACK	-
M	GPS Antenna	86760-480500-B1	Ic00387	-	-

*1) Used for Antenna Terminal conducted tests.
*2) Used for Radiated Emission tests.

List of cables used (1/3)

Pin No.	Connector	Item	Length(m)	Shield / Cable	Note
1	①	+B1	1.8	Unshielded	B
2		ACC1	1.8	Unshielded	B
3		ILL+	1.8	Unshielded	B
4		ILL-	1.8	Unshielded	GND
5		GND1	1.8	Unshielded	GND
6		HFL	1.8	Unshielded	open
7		LJB	1.8	Unshielded	open
8		HAZ	1.8	Unshielded	open
9		FLSW	1.8	Unshielded	open
10		MUTE1	1.8	Unshielded	to Amplifier 24pin
11		TX2+	1.8	Unshielded	
12		TX2-	1.8	Unshielded	
13		R+	1.8	Shielded	
14		R-	1.8		
15		L+	1.8		
16		L-	1.8		
17		SLD	1.8		
18		IVO+	1.8	Shielded	
19		IVO-	1.8		
20		SLD1	1.8		
21	②	+B	1.8	Unshielded	open
22		ACC	1.8	Unshielded	
23		GND	1.8	Unshielded	
24		CDR+	1.8	Shielded	
25		CDR-	1.8		
26		CDL+	1.8		
27		CDL-	1.8		
28		CSLD	1.8		
29		MUTE	1.8	Unshielded	
30		TX+	1.8	Unshielded	
31		TX-	1.8	Unshielded	
32	③	IG	1.8	Unshielded	B
33		ARON	1.8	Unshielded	GND
34		AIR	1.8	Unshielded	GND
35		PBEW	1.8	Unshielded	GND
36		SEUC	1.8	Unshielded	B
37		SNS2	1.8	Unshielded	GND
38		REV	1.8	Unshielded	open
39		ADIM	1.8	Unshielded	open
40		SPD	1.8	Unshielded	open
41		MIN+	1.8	Shielded	to microphone
42		MIN-	1.8		
43		SGND	1.8		
44		MACC	1.8	Unshielded	

List of cables used (2/3)

45		VV+	1.8	Shielded	to USB/AUX BOX
46		VV-	1.8		
47		SG	1.8		
48		VAR+	1.8	Shielded	
49		VA-	1.8		
50		VAL+	1.8		
51		AGND	1.8		
52	③	ADPG	1.8	Unshielded	
53		TX1+	1.8	Twist	to Remote Control Device
54		TX1-	1.8		
55		CANH	1.8	Twist	to Air-Conditioning ECU
56		CANL	1.8		
57		SW1	1.8	Unshielded	to steering switch
58		SW2	1.8	Unshielded	
59		SWG	1.8	Unshielded	
60		PKB	1.8	Unshielded	GND
61		TX4+	1.8	Unshielded	to Display 24pin
62		TX4-	1.8	Unshielded	
63		VMTF	1.8	Unshielded	
64	④	V+	1.8	Shielded	open
65		V-	1.8		open
66		CA+	1.8		open
67		CGND	1.8		open
68		TX3+	1.8	Unshielded	open
69		TX3-	1.8	Unshielded	open
70	-	ACC2	1.8	Unshielded	B
71		MUTE	1.8	Unshielded	to EUT 2.3ll _4P+1.0lll _16P
72		TX+	1.8	Twist	
73		TX-	1.8		
74		R+	1.8	Shielded	
75		R-	1.8		
76		L+	1.8		
77		L-	1.8		
78		-	1.8		
79		INT+	1.8	Shielded	
80		INT-	1.8		
81		-	1.8		

List of cables used (3/3)

82		+B3	1.8	Unshielded	B
83		ACC3	1.8	Unshielded	B
84		GND3	1.8	Unshielded	GND
85		ILL+3	1.8	Unshielded	B
86		REV3	1.8	Unshielded	open
87		TX+	1.8	Twist	to EUT 0.64_-16P
88		TX-	1.8		
89		VMTI	1.8	Unshielded	
90	-	V+	1.8	Unshielded	open
91		V-	1.8	Unshielded	
92		CA+	1.8	Unshielded	
93		CGND	1.8	Unshielded	
94		CSW+	1.8	Unshielded	open
95		TX2+	1.8	Twist	open
96		TX2-	1.8		open
97		TX1+	1.8	Twist	open
98		TX1-	1.8		open
99		GVI+	1.9		
100	⑤	GVI-	1.9	Shielded	to Display GV IF
101		GND	1.9		
102		Sub-ANT	0.15		to 75ohm termination
103		GND	0.15	Shielded	-
104	⑥	MAIN-ANT	0.15		to 75ohm termination
105		GND	0.15		-
106		ANT+	0.15	Unshielded	open
107		USV1	1.8		
108		US1-	1.8		
109	⑦	US1+	1.8	Shielded	to USB/AUX BOX
110		UGD1	1.8		
111		USG1	1.8		
112		ALO	0.15		
113		ARON	0.15		
114	-	ASGN	0.15	Shielded	to USB/AUX BOX
115		AUXO	0.15		
116		AGND	0.15		
117		CAN H	0.7	Unshielded	
118		CANL	0.7	Unshielded	
119		IG	0.7	Unshielded	
120	-	GND	0.7	Unshielded	Air-Conditioning ECU
121		+B	0.7	Unshielded	
122		LIN	0.7	Unshielded	
123	-	AMP wire Harness	1.8	Unshielded	-
124		Audio Mini Jack	1.8	Unshielded	-
125	⑧	GPS	1.2	Shielded	-

*All cables used for the measurement are exclusive use or marketed.

SECTION 5: Carrier frequency separation

Test procedure
The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 6: 20dB bandwidth & Occupied bandwidth (99%)

Test procedure
The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 7: Number of hopping frequency

Test procedure
The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 8: Dwell time

Test procedure
The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 9: Maximum peak output power

Test procedure
The Maximum Peak Output Power was measured with a power meter connected to the antenna port.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 10: Spurious emissions (Antenna port conducted)

Test procedure
The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port.
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.
In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=10kHz)

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 11: Radiated emission

11.1 Operating environment

The test was carried out in No.3 Semi-Anechoic Chamber.

Temperature : See test data (APPENDIX 2)
Humidity : See test data (APPENDIX 2)

11.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 2.0m, raised 80cm above the conducting ground plane.
The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.
The rear of EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the 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.
Photographs of the set up are shown in APPENDIX 1.

11.3 Test conditions

Frequency range : 30MHz to 25GHz
Test distance : 3m(below 13GHz) / 1m(above13GHz)
EUT position : Table top

11.4 Test procedure

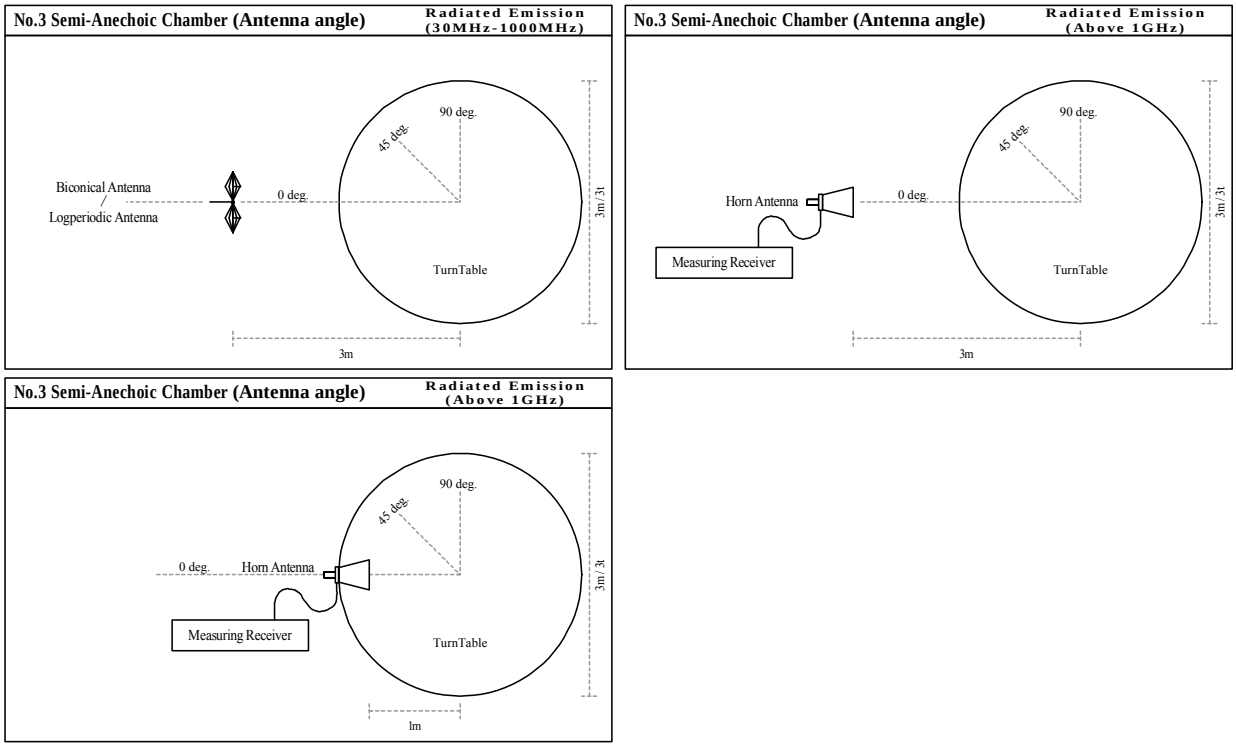
The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m(below 13GHz) / 1m(above 13GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied between 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.
The radiated emission measurements were made with the following detection of the test receiver.

Frequency	:	30-1000MHz	1000-2000MHz	
Detection Type	:	Quasi-Peak	Peak	* Average
IF Bandwidth	:	120kHz	RBW:1MHz/VBW:3MHz	RBW:1MHz/VBW:See data

* When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.
* The VBW was based on the inverse of the duty cycle (Refer to Appendix 2).

The EUT was tested in the direction normally used.

Figure 1. Antenna angle



11.5 Band edge

Band edge level is below the limits of FCC 15.209. Refer to the data of Radiated emission.

11.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.
Refer to APPENDIX 2

Contents of APPENDIXES