



Underwriters
Laboratories

Test report No. : 30JE0223-YK-01-A
Page : 1 of 47
Issued date : July 13, 2010
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FCC ID : AJDK032

RADIO TEST REPORT

Test Report No. : 30JE0223-YK-01-A

Applicant : PIONEER CORPORATION

Type of Equipment : CD Receiver

Model No. : CVH-2118

FCC ID : AJDK032

Test regulation : FCC Part 15 Subpart C 2010

Test Result : Complied

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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.
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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: June 28 to July 2, 2010

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SECTION 1: Customer information

Company Name : PIONEER CORPORATION
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SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : CD Receiver
Model No. : CVH-2118
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 10.5-16V
Receipt Date of Sample : June 23, 2010
Country of Mass-production : China
Condition of EUT : Production model
Modification of EUT : No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system : CPU: 16MHz

Radio Specification

[Bluetooth (Ver. 2.0 with EDR function)]

Radio Type : Transceiver
Frequency of Operation : 2402-2480MHz
Modulation : FHSS
Power Supply (radio part input) : DC 3.3V
Antenna type : inverted F type
Antenna Gain : -1.70dBi max. [2402 to 2480 MHz]

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	: FCC Part15 Subpart C: 2010, final revised on January 22, 2010 and effective March 1, 2010
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

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.2	FCC: Section 15.207 IC: RSS-Gen 7.2.2	N/A	N/A *1)	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-210 A8.1 (b)		Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-210 A8.1 (a)		N/A	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-210 A8.1 (d)	See data.	Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-210 A8.1 (d)		Complied	Conducted
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 4.8	FCC: Section15.247(b)(1) IC: RSS-210 A8.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 4.9 RSS-Gen 4.10	FCC: Section15.247(d) IC: RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3	[Tx] 0.4dB 185.014MHz, QP, Hori. [Rx] 0.7dB 57.293MHz, QP, Hori. 185.022MHz, QP, Hori.	Complied	Conducted/ Radiated

Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15.

*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC 15.31 (e)

This EUT provides stable voltage (DC 3.3V and DC 1.5V) constantly to RF part regardless of input voltage. 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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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	N/A	N/A	Conducted

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

3.4 Uncertainty

EMI

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)	30MHz-300MHz	4.6 dB	4.5 dB	4.9 dB
	300MHz-1GHz	4.5 dB	4.6 dB	5.1 dB
	1GHz-18GHz	3.9 dB	3.9 dB	4.0 dB
	18GHz-26.5GHz	4.4 dB	4.4 dB	4.4 dB
Radiated emission (Measurement distance: 1m)	1GHz-18GHz	4.8 dB	4.8 dB	4.8 dB
	18GHz-40GHz	4.2 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 report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

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JAB Accreditation No. : RTL02610

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.1 Shielded room	6.8 x 4.1 x 2.7
No.2 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.2 Shielded room	6.8 x 4.1 x 2.7
No.3 Semi-anechoic chamber	12.7 x 7.7 x 5.35 Maximum measurement distance: 5m	No.3 Shielded room	6.3 x 4.7 x 2.7
No.4 Semi-anechoic chamber	8.1 x 5.1 x 3.55	No.4 Shielded room	4.4 x 4.7 x 2.7
		No.5 Shielded room	7.8 x 6.4 x 2.7
		No.6 Shielded room	7.8 x 6.4 x 2.7

No.1/ No.2/ No.3 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on April 17, 2009 (Registration No.: 697847).

IC Registration No. : 2973D-1 (No1 anechoic chamber)
2973D-2 (No2 anechoic chamber)
2973D-3 (No3 anechoic chamber)

3.6 Test set up, Data of EMI, and Test instruments

Refer to APPENDIX.

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

4.1 Operating Mode(s)

Bluetooth (BT): Transmitting (Tx), Payload: PRBS9
 Receiving (Rx)
 Inquiry

Details of Operating Mode(s)

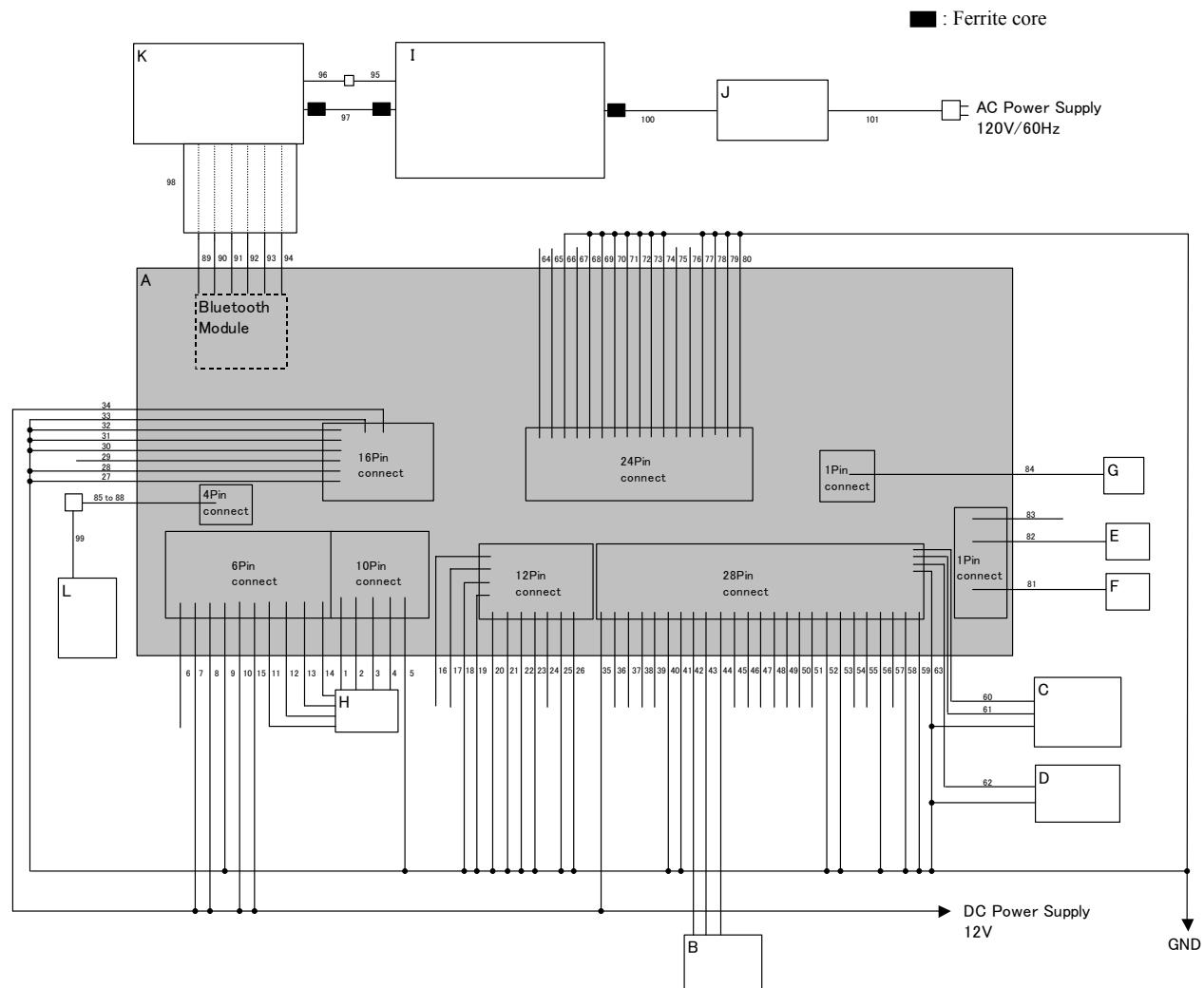
Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping off) DH5, 3DH5	2402MHz 2441MHz 2480MHz
	Rx	2441MHz
Carrier Frequency Separation	Tx (Hopping on) DH5, 3DH5 Inquiry	2402MHz 2441MHz 2480MHz
20dB Bandwidth	Tx (Hopping off) DH5, 3DH5 Inquiry	2402MHz 2441MHz 2480MHz
Number of Hopping Frequency	Tx (Hopping on) DH5, 3DH5 Inquiry	-
Dwell time	Tx (Hopping on), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5 Inquiry	-
Maximum Peak Output Power	Tx (Hopping off) DH5, 2DH5, 3DH5 Inquiry	2402MHz 2441MHz 2480MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2480MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2441MHz 2480MHz
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) AFH mode does not influence on the output power and bandwidth of the EUT. However, the limit level 125mW of AFH mode was used due to the overlap of the bandwidth.</p> <p>*Software for testing: HCITester2 (Rev: 0.991d) Power settings: Fixed (The setting is not controlled by the software and it is equivalent to that of mass-produced items.) Above setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting.</p>		

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4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	CD Receiver	CVH-2118	AABB999998US *1) AABB999999US *2)	Pioneer	EUT FCC ID: AJDK032
B	microphone	86730-48010	-	KOJIMA PRESS	
C	steering switch1	86250-48110-C0	-	TOKAI RIKA	
D	steering switch2	-	-	Pioneer	
E	75ohm termination	T1221C	-	STACK	
F	75ohm termination	T1221C	-	STACK	
G	50ohm termination	-	-	Pioneer	
H	4ohm SPK dummy	RHA 75N	-	TAKMAN	
I	Laptop PC	Think Pad X60	LV-G5452 06/08	IBM	
J	AC Adapter	92P1160	11S92P1160Z1ZBGH 721EW4	IBM	
K	Bluetooth control unit	T41786	MB09091500	Murata	
L	iPod	iPod nano	-	Apple	

*1) Used for Radiated Emission test

*2) Used for Antenna Terminal conducted test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	RR+	3	Unshielded	Unshielded	gray
2	RR-	3	Unshielded	Unshielded	yellow
3	RL+	3	Unshielded	Unshielded	purple
4	RL-	3	Unshielded	Unshielded	yellow
5	ILL-	3	Unshielded	Unshielded	orange
6	AMP	3	Unshielded	Unshielded	yellow/white
7	+B1	3	Unshielded	Unshielded	yellow
8	ACC1	3	Unshielded	Unshielded	red
9	GND1	3	Unshielded	Unshielded	black
10	ILL+	3	Unshielded	Unshielded	black/orange
11	FR+	3	Unshielded	Unshielded	blue
12	FR-	3	Unshielded	Unshielded	black
13	FL+	3	Unshielded	Unshielded	green
14	FL-	3	Unshielded	Unshielded	black
15	TMU	3	Unshielded	Unshielded	lite green
16	+B	3	Unshielded	Unshielded	yellow
17	ACC	3	Unshielded	Unshielded	red
18	GND2	3	Unshielded	Unshielded	black
19	CDR+	3	Shield	Unshielded	red
20	CDR-	3	Shield	Unshielded	yellow
21	CDL+	3	Shield	Unshielded	green
22	CDL-	3	Shield	Unshielded	brown
23	CSLD	3	Shield	Unshielded	black
24	MUTE	3	Unshielded	Unshielded	blue/white
25	TXM+	3	Unshielded	Unshielded	green
26	TXM-	3	Unshielded	Unshielded	brown
27	TX3+	3	Unshielded	Unshielded	green
28	TX3-	3	Unshielded	Unshielded	brown
29	CA+	3	Shield	Unshielded	red
30	V+	3	Shield	Unshielded	white

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No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
31	V-	3	Shield	Unshielded	blue
32	CGND	3	Shield	Unshielded	black
33	PKB	3	Unshielded	Unshielded	black
34	BTCY	3	Unshielded	Unshielded	lite blue/black
35	IG	3	Unshielded	Unshielded	blue
36	REV	3	Unshielded	Unshielded	yellow/white
37	ADIM	3	Unshielded	Unshielded	pink/white
38	SPD	3	Unshielded	Unshielded	pink
39	LRHD	3	Unshielded	Unshielded	purple
40	ADPG	3	Unshielded	Unshielded	pink/black
41	SNS2	3	Unshielded	Unshielded	white
42	MACC	5	Shield	Unshielded	red
43	MIN+	5	Shield	Unshielded	white
44	MIN-	5	Shield	Unshielded	blue
45	SGND	3	Shield	Unshielded	black
46	TX1+	3	Unshielded	Unshielded	green
47	TX1-	3	Unshielded	Unshielded	gray
48	CANH	3	Unshielded	Unshielded	purple/white
49	CANL	3	Unshielded	Unshielded	purple/black
50	VAR+	3	Shield	Unshielded	red
51	VAL+	3	Shield	Unshielded	white
52	VA-	3	Shield	Unshielded	blue
53	AGND	3	Shield	Unshielded	black
54	IVI+	3	Shield	Unshielded	red
55	IVI-	3	Shield	Unshielded	white
56	I SLD	3	Shield	Unshielded	black
57	VV+	3	Shield	Unshielded	pink
58	VV-	3	Shield	Unshielded	lite green
59	VSG	3	Shield	Unshielded	black
60	SW1	3	Unshielded	Unshielded	red
61	SW2	3	Unshielded	Unshielded	blue
62	SW3	3	Unshielded	Unshielded	white
63	SWG	3	Unshielded	Unshielded	black
64	+B2	3	Unshielded	Unshielded	yellow
65	ACC2	3	Unshielded	Unshielded	red
66	GND	3	Unshielded	Unshielded	black
67	SPDO	3	Unshielded	Unshielded	blue/red
68	AGND	3	Unshielded	Unshielded	black
69	NVVS	3	Shield	Unshielded	yellow
70	NVHS	3	Shield	Unshielded	brown
71	R	3	Shield	Unshielded	red
72	G	3	Shield	Unshielded	green
73	B	3	Shield	Unshielded	blue
74	SLD2	3	Shield	Unshielded	black
75	MIC+	3	Shield	Unshielded	red
76	MIC-	3	Shield	Unshielded	white
77	MSLD	3	Shield	Unshielded	black
78	VOI+	3	Shield	Unshielded	pink
79	VOI-	3	Shield	Unshielded	lite green
80	SLD1	3	Shield	Unshielded	black

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No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
81	SUB	0.14	Shield	Unshielded	black
82	MAIN	0.14	Shield	Unshielded	black
83	ANT+	0.18	Shield	Unshielded	green
84	XM	0.5	Shield	Unshielded	black
85	USV1	2	Shield	Unshielded	gray
86	US1-	2	Shield	Unshielded	gray
87	US1+	2	Shield	Unshielded	gray
88	UGD1	2	Shield	Unshielded	gray
89	TXD	0.6	Unshielded	Unshielded	gray
90	RXD	0.6	Unshielded	Unshielded	gray
91	CTS	0.6	Unshielded	Unshielded	gray
92	RTS	0.6	Unshielded	Unshielded	gray
93	RST	0.6	Unshielded	Unshielded	gray
94	GND	0.6	Unshielded	Unshielded	gray
95	USB-RS232C transformer	0.6	Shield	Unshielded	
96	RS-232C serial cross interlink cable	2.0	Shield	Unshielded	
97	USB A-B	1.4	Shield	Unshielded	
98	FFC	0.35	Unshielded	Unshielded	
99	Ipod-USB Cable	1.0	Unshielded	Unshielded	
100	DC Cable	1.8	Unshielded	Unshielded	
101	AC Cable	0.9	Unshielded	Unshielded	

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SECTION 5: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0m by 2.0m, raised 0.8m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1GHz	Above 1GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	PK	AV
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz or RBW: 1MHz VBW: 300Hz *1)
Test Distance	3m	3m (below 13GHz), 1m*2) (above 13GHz),	

*1) Used for the band edge of the carrier and the harmonics that can be measured. The VBW is based on the inverse of the duty cycle (Refer to page 33).

*2) Distance Factor: $20 \times \log (3.0m/1.0m) = 9.5dB$

The test was made on EUT at the normal use position.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range	: 30M-25GHz
Test data	: APPENDIX
Test result	: Pass

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SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20dB Bandwidth	3MHz	30kHz	100kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3MHz or 5MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30MHz	300kHz	1MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	1MHz	3MHz	As necessary capture the entire dwell time per hopping channel	Peak	Max Hold	Spectrum Analyzer
Conducted Spurious Emission	Less or equal to 5GHz (Range: 30MHz-25GHz)	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass