



RADIO TEST REPORT

Test Report No. : 28CE0262-HO-A

Applicant : **Sony Corporation**
Type of Equipment : **Compact Disc Receiver**
Model No. : **HCD-BX50BTi**
FCC ID : **AK8HCDBX50BTI**
Test standard : **FCC Part 15 Subpart C 2007
Section 15.207, Section 15.247**
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 above regulation.
4. The test results in this report are traceable to the national or international standards.

Date of test:

November 5 to 8, 2007

Tested by:

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NVLAP LAB CODE: 200572-0

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CONTENTS	PAGE
SECTION 1: Client information.....	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results	4
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Conducted Emission	11
SECTION 6: Spurious Emission.....	12
SECTION 7: Bandwidth.....	13
SECTION 8: Maximum Peak Output Power	13
SECTION 9: Carrier Frequency Separation.....	13
SECTION 10: Number of Hopping Frequency	14
SECTION 11: Dwell time	14
APPENDIX 1: Photographs of test setup.....	15
Conducted Emission	15
Spurious Emission (Radiated)	16
APPENDIX 2: Data of EMI test	17
Conducted Emission	17
Carrier Frequency Separation	23
20dB Bandwidth.....	25
Number of Hopping Frequency.....	27
Dwell time	29
Maximum Peak Output Power	32
Radiated Spurious Emission (below 1GHz)	33
Radiated Spurious Emission (above 1GHz)	37
Conducted Spurious Emission.....	41
99% Occupied Bandwidth	46
APPENDIX 3: Test instruments	47

SECTION 1: Client information

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Contact Person : Kikuo Murata

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

2.1 Identification of E.U.T.

Type of Equipment : Compact Disc Receiver
Model No. : HCD-BX50BTi
Serial No. : 01155
Rating : AC120V/60Hz
Country of Manufacture : China
Receipt Date of Sample : October 30, 2007
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.

2.2 Product Description

Model No: HCD-BX50BTi (referred to as the EUT in this report) is the Compact Disc Receiver.

Clock frequency(ies) in the system : Micro computer clock: 5MHz, Clock IC: 32.768kHz,
Remote controller: 3.84MHz, CD DSP: 16.934MHz, IPOD IC: 20MHz,
Bluetooth DSP: 24MHz
Equipment Type : Transceiver
Frequency of Operation : 2402-2480MHz
Bandwidth & Channel Spacing : 1MHz & 1MHz
Modulation : FHSS
Power Supply (inner) : DC 3.3V
Antenna Type : Pattern Antenna
Antenna Gain : 3.608 dBi max

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C: 2007
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

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Module 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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3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
1	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	[AV] 35.9dB 0.15170MHz, N [QP] 38.4dB 0.15170MHz, N 0.15085MHz, L	Complied
2	Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1) ----- IC: RSS-210 A8.1 (b)	Conducted	N/A	See data.	Complied
3	20dB Bandwidth	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1) ----- IC: RSS-210 A8.1 (a)	Conducted	N/A		Complied
4	Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1)(iii) ----- IC: RSS-210 A8.1 (d)	Conducted	N/A		Complied
5	Dwell time	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(a)(1)(iii) ----- IC: RSS-210 A8.1 (d)	Conducted	N/A		Complied
6	Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 ----- IC: RSS-Gen 4.6	FCC: Section 15.247(b)(1) ----- IC: RSS-210 A8.4 (2)	Conducted	N/A		Complied
7	Band Edge Compliance	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section 15.247(d) ----- IC: RSS-210 A8.5	Conducted	N/A		Complied
8	Spurious Emission	FCC: FCC Public Notice DA 00-705 ----- IC: RSS-Gen 4.9 RSS-Gen 4.10	FCC: Section 15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.1 and 7.2.3	Conducted/ Radiated	N/A		[Tx] 7.8dB, AV, 2483.5MHz, Horizontal [Rx] 6.2dB, AV, 1626.300MHz, Vertical

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

*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	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	Conducted	N/A	N/A	N/A

3.4 Uncertainty

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

Conducted Emission

The measurement uncertainty for this test is ± 3.73 dB.

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

Spurious Emission (Radiated)

The measurement uncertainty for this test using Biconical antenna is ± 4.88 dB(3m).

The measurement uncertainty for this test using Logperiodic antenna is ± 4.86 dB(3m).

The measurement uncertainty for this test using Horn antenna is ± 5.77 dB.

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

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty for this test is ± 3.0 dB.

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3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	N/A	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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

4.1 Operating Mode(s)

The mode(s) ;

Test	Mode	Tested frequency
Conducted Emission	Transmitting (Tx)(Hopping OFF), Packet type: DH5, Payload: PRBS9	2402MHz 2441MHz 2480MHz
	Receiving (Rx), Packet type: DH5	2441MHz
	Standby	-
Carrier Frequency Separation	Transmitting (Tx)(Hopping ON), Packet type: DH5, Payload: PRBS9 / Inquiry	2402MHz 2441MHz 2480MHz
20dB Bandwidth Maximum Peak Output Power	Transmitting (Tx)(Hopping OFF), Packet type: DH5, Payload: PRBS9 / Inquiry	2402MHz 2441MHz 2480MHz
Number of Hopping Frequency	Transmitting (Tx)(Hopping ON), Packet type: DH5, Payload: PRBS9 /Inquiry	-
Dwell time	Transmitting (Tx)(Hopping ON), Payload: PRBS9, Packet type: -DH1 -DH3 -DH5 / Inquiry	-
Spurious Emission (Conducted/Radiated)	Transmitting (Tx)(Hopping OFF), Packet type: DH5, Payload: PRBS9	2402MHz 2441MHz 2480MHz
	Receiving (Rx), Packet type: DH5	2441MHz
Band Edge Compliance (Conducted)	Transmitting (Tx), Packet type: DH5, Payload: PRBS9, -Hopping ON -Hopping OFF	2402MHz 2480MHz
Band Edge Compliance (Radiated)	Transmitting (Tx)(Hopping OFF), Packet type: DH5, Payload: PRBS9	2402MHz 2480MHz
99% Occupied Bandwidth	Transmitting (Tx), Packet type: DH5, 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.

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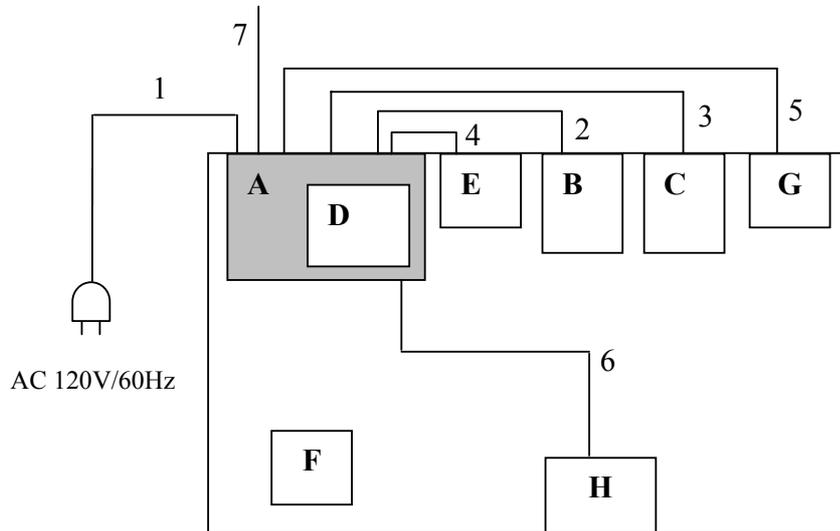
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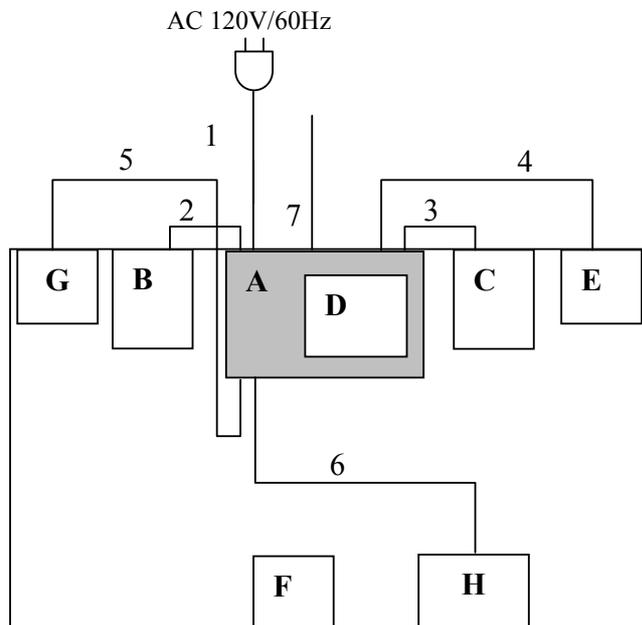
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4.2 Configuration and peripherals

[Conducted Emission test]



[Radiated Spurious Emission test]



* Cabling and setup(s) were 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	Remarks
A	Compact Disc Receiver	HCD-BX50BTi	01155	Sony	EUT
B	Speaker	SS-CBX20	1	Sony	-
C	Speaker	SS-CBX20	2	Sony	-
D	MP3 Player (iPod)	A1199	5K72BPVQ5	Apple	-
E	AM Loop antenna	-	-	Sony	-
F	Remote Controller	RM-AMU0009	-	Sony	-
G	Portable CD Player	SL-CT520-A	WL7GA002317R	Panasonic	-
H	Headphone	LT-100	-	-	-

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	AC cable	1.8	Unshielded	Unshielded
2	Speaker cable	1.4	Unshielded	Unshielded
3	Speaker cable	1.4	Unshielded	Unshielded
4	AM antenna cable	0.9	Unshielded	Unshielded
5	Audio cable	1.5	Shielded	Shielded
6	Audio cable	2.5	Unshielded	Unshielded
7	FM antenna cable	2.2	Unshielded	Unshielded

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane 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 a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

Detector	: quasi-peak and average detector (IF BW 9 kHz)
Measurement range	: 0.15-30MHz
Test data	: APPENDIX 2
Test result	: Pass

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SECTION 6: Spurious Emission

[Conducted]

Test Procedure

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

The following spectrum analyzer setting was used:

- RBW: 100kHz
- VBW: 300kHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

Test data : APPENDIX 2

Test result : Pass

[Radiated]

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0m by 1.0m, raised 80cm above the conducting ground plane.

The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).

The height of the measuring 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 with the Test Receiver, or 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.

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.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 2 of RSS-210 2.7 (IC) and outside the restricted band of FCC15.205 / Table 1 of RSS-210 2.7 (IC).

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver / Spectrum Analyzer	Spectrum Analyzer
Detector	QP: BW 120kHz(T/R)	PK: RBW:1MHz/VBW: 1MHz
IF Bandwidth	20dBc : RBW: 100kHz VBW: 300kHz (S/A)	AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

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

Test data : APPENDIX 2

Test result : Pass

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SECTION 7: Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.
The following spectrum analyzer setting was used:

- Span: 3MHz
- RBW: 30kHz
- VBW: 100kHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

Test data : APPENDIX 2
Test result : Pass

SECTION 8: Maximum Peak Output Power

Test Procedure

The Maximum Peak Output Power was measured with a power meter (tested bandwidth: 50MHz) connected to the antenna port.

Test data : APPENDIX 2
Test result : Pass

SECTION 9: Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.
The following spectrum analyzer setting was used:

- Span: 3MHz
- RBW: 100kHz
- VBW: 300kHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

Test data : APPENDIX 2
Test result : Pass

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SECTION 10: Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.
The following spectrum analyzer setting was used:

- Span: 30MHz
- RBW: 300kHz
- VBW: 1MHz
- Sweep: Auto
- Detector: Peak
- Trace: Max Hold

Test data : APPENDIX 2
Test result : Pass

SECTION 11: Dwell time

Test Procedure

The Dwell time was measured with a spectrum analyzer connected to the antenna port.
The following spectrum analyzer setting was used:

- Span: Zero Span
- RBW: 1MHz
- VBW: 1MHz
- Sweep: as necessary to capture the entire dwell time per hopping channel
- Detector: Peak
- Trace: Max Hold

Test data : APPENDIX 2
Test result : Pass