



EMI TEST REPORT

Test Report No. : 27EE0160-HO-F-1

Applicant : Sony Corporation
Type of Equipment : RF Stereo Transmitter
Model No. : TMR-RF970R
Test standard : FCC Part 15 Subpart C
Section 15.207, Section 15.249: 2006
FCC ID : AK8TMRRF970R
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.

Date of test:

December 26, 2006 to January 20, 2007

Tested by:

Norihisa Hashimoto
EMC Services

Takumi Shimada
EMC Services

Approved by :

Hironobu Shimoji
Assistant Manager of EMC Services



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://ulapex.jp/emc/nvlap.htm>

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SECTION 1: Client information

Company Name : Sony Corporation
Address : Shinagawa INTERCITY C Tower, 2-15-3 Konan, Minato-ku,
Tokyo 108-6201, Japan
Telephone Number : +81-3-5769-5640
Facsimile Number : +81-3-5769-5085
Contact Person : Kikuo Murata

<Remarks for data sheets>

*Sony EMCS Corporation Saitama TEC (Subsidiary Company Name) is on behalf of the applicant: Sony Corporation.

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

2.1 Identification of E.U.T.

Type of Equipment : RF Stereo Transmitter
Model No. : TMR-RF970R
Serial No. : 14#
Rating : DC 12V(use AC adaptor AC-S1202S/input AC120V 60Hz , output DC12V)
Country of Manufacture : China
Receipt Date of Sample : December 14, 2006
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: TMR-RF970R is RF Stereo Transmitter.

Clock frequency	Pilot Tone :38kHz,19kHz PLL :4MHz Charge :125kHz Micro computer :1MHz
Equipment Type	Transmitter
Frequency of Operation	915.5 MHz to 916.5 MHz
Channel spacing	500kHz
Type of Modulation	FM
Antenna Type	Integral Antenna
Method of frequency generation	Synthesizer
Power Supply (Inner)	DC 5.0V

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2006
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.249 Operation within the bands 902 – 928MHz,
2400 – 2483.5MHz, 5725 – 5875MHz, and 24.0 – 24.25GHz

FCC 15.31 (e)

This EUT provides stable voltage (DC 5.0V) 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.

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Result
1	Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC: Section 15.207	-	N/A	46.3dB 0.27386MHz N, AV	Complied
2	Electric Field Strength of Fundamental Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section 15.249	Radiated	N/A	1.8dB 916.512MHz, Horizontal, QP	Complied
3	Electric Field Strength of Spurious Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section 15.249, Section 15.209 *1)	Radiated	N/A	4.9 dB 905.801MHz, Vertical, QP	Complied
4	-20dB bandwidth	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section 15.215	Radiated	N/A	-	Complied

Note: UL Apex's EMI Work procedures No. QPM05 and QPM15.

*1) The limit for above 1GHz was applied with Section 15.209 which is more stringent.

*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	RSS-Gen 4.4.1	-	Radiated	N/A	N/A	N/A

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3.4 Uncertainty

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 2.66\text{dB}$.
The data listed in this test report has enough margin, more than the site margin.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is $\pm 4.41\text{dB}(3\text{m})/\pm 4.39\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.59\text{dB}(3\text{m})/\pm 4.58\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 4.62\text{dB}(3\text{m})/\pm 4.60\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 5.27\text{dB}$.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	655103	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247A-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247A-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	-
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	N/A	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	2.0 x 2.0 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 5.4 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	-

* 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.7 shielded room.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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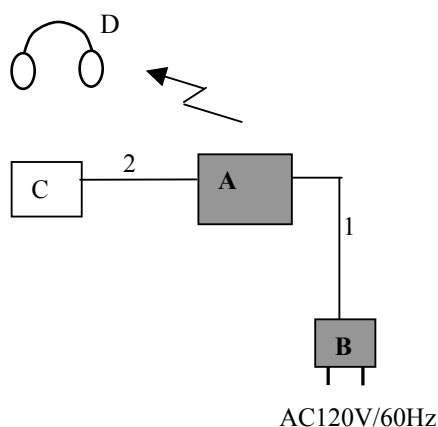
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SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used : Transmitting mode
*EUT is transmitting continuously to the headphones with FM signals.

4.2 Configuration and peripherals



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	RF Stereo Transmitter	TMR-RF970R	14#	SONY	EUT
B	AC Adaptor	AC-S1202S	-	SONY	EUT

Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
C	Tape Recorder	TCM-20DV	-	SONY	-
D	Wireless Stereo Headphone	MDR-RF970R	1	SONY	-

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	DC cable	1.9	Unshielded	Unshielded
2	Audio cable	1.0	Shielded	Shielded

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SECTION 5: Conducted Emission

5.1 Operating environment

Test place : No.4 semi anechoic chamber.
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a wooden table 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 and its peripherals 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/AMN and excess AC cable was bundled in center. I/O 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. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/ an 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 on a horizontal conducting plane 4.0 x 4.0m and a vertical conducting plane 2.0 x 2.0m in a semi Anechoic Chamber. A drawing of the set up is shown in the photos of APPENDIX 1.

5.3 Test conditions

Frequency range : 0.15MHz – 30MHz
EUT position : Table top
EUT operation mode : Transmitting

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT in the semi Anechoic Chamber.

The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains Network (AMN). An overview sweep with peak detection has been performed.

The measurements had been performed with a quasi-peak detector and if required, with an average detector.

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : QP and AV
IF Bandwidth : 9kHz

5.5 Test result

Summary of the test results : Pass

Date: January 19-20,2007

Tested by: Takumi Shimada

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SECTION 6: Radiated emission (Fundamental and Spurious Emission)

6.1 Operating environment

Test place : No.3 semi anechoic chamber / No.4 semi anechoic chamber
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane.
The EUT was set on the center of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna varied in height above the conducting ground plane to obtain the maximum signal strength.
A drawing of the set up is shown in the photos of APPENDIX 1.

6.3 Test conditions

Frequency range : 30MHz-1GHz, 1GHz-10GHz
Test distance : 3m
EUT position : Tabletop
EUT operation mode : Transmitting

6.4 Test procedure

The measuring antenna height 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.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz / VBW:1MHz AV: RBW1MHz / VBW:10Hz

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

6.5 Test Results

Summary of the test results: Pass

Date: December 26 and 29, 2006
January 19, 2007

Tested by: Norihisa Hashimoto
Tested by: Takumi Shimada

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