



EMI TEST REPORT

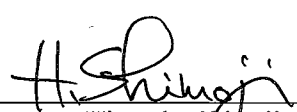
Test Report No. : 25FE0237-HO-1

Applicant : SANYO Technosound Co., Ltd.
Type of Equipment : DVD Home Theater System (Transmitter)
Model No. : DWM-4500 (ASX-DWM-4500W)
Test standard : FCC Part 15 Subpart C
Section 15.207 and Section 15.249: 2004
FCC ID : NPKDWM-4500
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 : February 7, 2005

Tested by : 
Mitsuru Fujimura
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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SECTION 1: Client information

Company Name : SANYO Technosound Co., Ltd.
Brand Name : SANYO
Address : 1-1 Sanyo-cho, Daito-shi, Osaka-fu 574-8534 JAPAN
Telephone Number : +81 72 870 6344
Facsimile Number : +81 72 870 4447
Contact Person : Osamu Azechi

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

2.1 Identification of E.U.T.

Type of Equipment : DVD Home Theater System (Transmitter)
Model No. : DWM-4500 (ASX-DWM-4500W)
Serial No. : 1
Rating : AC 120V/ 60Hz
Country of Manufacture : China
Receipt Date of Sample : January 14, 2005
Condition of E.U.T. : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model: DWM-4500 (referred to as the EUT in this report) is a DVD Home Theater System (Transmitter) Home System, which has rear speaker (wireless).

The clock frequencies used in EUT:

Total system:	8.00 MHz	MPEG. Decoder:	27.00 MHz
Wireless interface:	4.19 MHz	Tuner PLL:	7.2 MHz

Equipment Type : Transmitter
Frequency operation : 914.10MHz to 915.30MHz

FCC Part 15.203 Antenna requirement

Since RF Stereo Transmitter uses a transmitting antenna that is an integral part of the equipment, it is impossible for end users to replace the antenna without use of a special tool. Therefore, the equipment complies with the requirement of 15.203.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C Section 15.207 and 15.249:2004
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted emission limits; general requirements
Section 15.249 Operation within the bands 902-928MHz, 2400-2483.5MHz,
5725-5875MHz and 24.0-24.25GHz

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Deviation	Worst margin	Results
1	Conducted Emission	ANSI C63.4:2003	Section 15.207(a)	N/A	9.0dB (3.5481MHz, L1, AV)	Complied
2	Radiated Emission	ANSI C63.4:2003	Section 15.249	N/A	<u>Fundamental</u> 4.5dB(915.311MHz, Horizontal, QP) <u>Spurious *1)</u> 2.3dB(50.452MHz, Horizontal, QP)	Complied
3	-26dB Bandwidth	ANSI C63.4:2003	Reference	N/A	N/A	Complied
4	Frequency Stability	ANSI C63.4:2003	Section 15.31(e)	N/A	See data (p.24)	Complied

*Note: UL Apex's EMI Work Procedure QPM05.

*1) As is stated in Section 15.249 (d), the limit in 15.209 is higher than the value of 50dBc. Therefore, the test result is applied to Section 15.109.

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

3.4 Uncertainty

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is ± 1.3 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 ± 4.5 dB(3m).
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB(3m).
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ± 6.6 dB.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

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	Listed date (for FCC)	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	February 01, 2002	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	June 05, 2002	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 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 and No.2 semi-anechoic and No.3 shielded room.

3.6 Test set up, Test instruments and Data of EMI

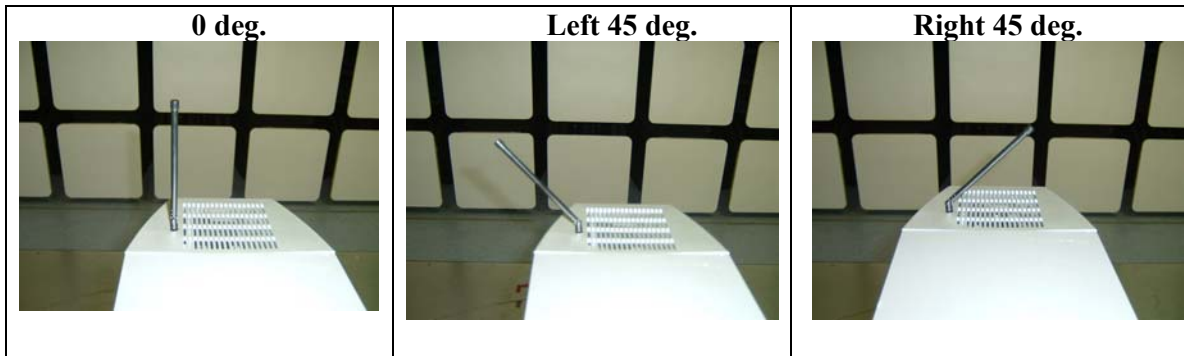
Refer to APPENDIX 1 to 3.

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

4.1 Operating Modes

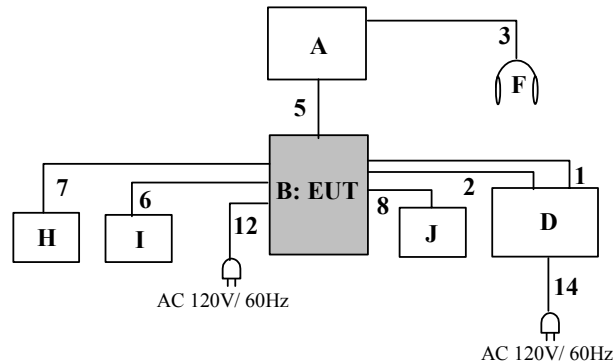
The mode is used: Transmitting Ch1 914.10/ Ch4 915.30MHz for Conducted emission
 Transmitting Ch1 914.10/ Ch4 915.30MHz Antenna Right 45 deg. for Radiated emission

*Antenna “Right 45 deg.” and “Left 45 deg.” are leaned right side and left side from Vertical position as 0 deg.



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	FCC ID	Remark
A	Main Unit (DVD Receiver)	DWM-4500	proto type	SANYO Technosound	-	-
B*	Sub-woofer (Powered Speaker)	ASX-DWM-4500W	proto type	SANYO Technosound	NPKDWM-4500	EUT
D	TFT Monitor	LL-T1530A	1A051790	Sharp	-	-
F	Headphone	-	-	-	-	-
H	Front Speaker R	DWM-4500S	-	-	-	-
I	Front Speaker L	DWM-4500S	-	-	-	-
J	Center Speaker	DWM-4500C	-	-	-	-

* [B]:Sub-woofer has the function of radio transmitter.

List of cables used

No.	Name	Length (m)	Shield	Backshell material	Remark
1	Video Cable	1.5	Shielded	Polyvinyl chloride	-
2	S-Video Cable	1.5	Shielded	Polyvinyl chloride	-
3	Phones	1.0	Unshielded	Polyvinyl chloride	-
5	System Cable	2.5	Shielded	Polyvinyl chloride	-
6	Speaker Cable	5.0	Unshielded	Polyvinyl chloride	-
7	Speaker Cable	5.0	Unshielded	Polyvinyl chloride	-
8	Speaker Cable	5.0	Unshielded	Polyvinyl chloride	-
12	AC Power Cable	1.6	Unshielded	Polyvinyl chloride	-
14	AC Power Cable	1.5	Unshielded	Polyvinyl chloride	-

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SECTION 5: Conducted Emission

5.1 Operating environment

Test place	:	No.2 semi anechoic chamber
Temperature	:	See data
Humidity	:	See data

5.2 Test configuration

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 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 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 to the input power source. 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	:	See Clause 4.1

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within No.2 semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection has been performed. The measurements have 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	:	Quasi-Peak
IF Bandwidth	:	9 kHz

5.5 Results

Summary of the test results: Pass

Date: February 7, 2005

Test engineer: Mitsuru Fujimura

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SECTION 6: Radiated emission (Fundamental and Spurious Emission)

6.1 Operating environment

Test place : No.2 semi anechoic chamber
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The EUT was set on the center of the tabletop and the rear the peripheral was aligned and flushed with rear of tabletop. 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. A drawing of the set up is shown in the photos of APPENDIX 1.

6.3 Test conditions

Frequency range : 30MHz - 300MHz(Biconical antenna) / 300MHz - 1000MHz(Logperiodic antenna) / 1GHz - 10GHz(Horn antenna)
Test distance : 3m
EUT position : Tabletop
EUT operation mode : See Clause 4.1

6.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on No.2 semi anechoic chamber with a ground plane and at a distance of 3m. Measurements were performed with a quasi-peak detector, average detector or peak detector. 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. The radiated emission measurements were made with the following detector function of the test receiver and spectrum Analyzer.

	Below 1GHz (T/R)	Above 1GHz (S/A)
Detector Type	Quasi-Peak	Average/Peak
IF Bandwidth	120kHz	RBW 1MHz, VBW 10Hz/ RBW 1MHz, VBW 1MHz

6.5 Results

Summary of the test results: Pass

Date: February 7, 2005

Tested by: Mitsuru Fujimura

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APPENDIX 1: Photographs of test setup

Conducted Emission

Front



Side

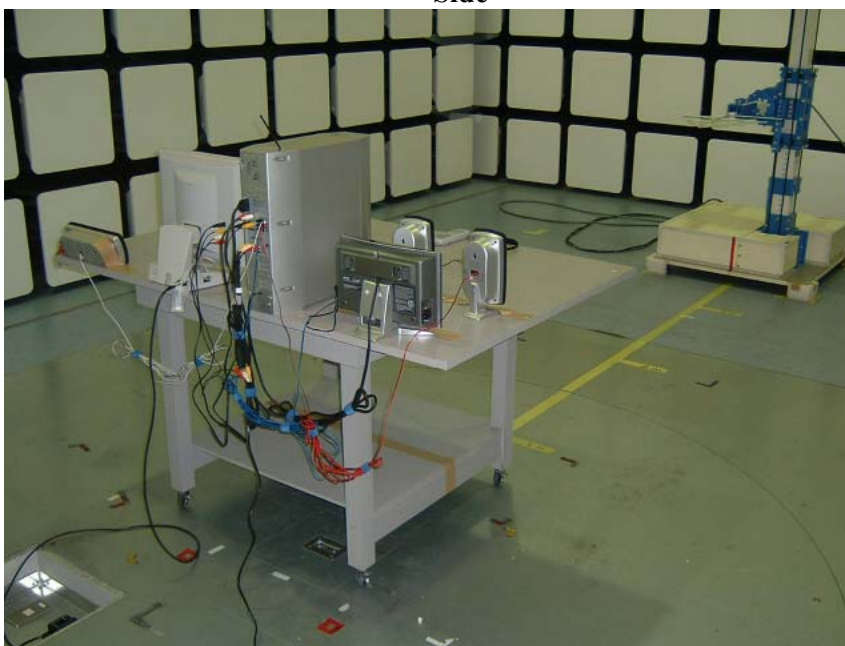


Radiated Emission

Front



Side



APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE,CE	2004/04/12 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	RE,CE	2004/02/18 * 12
MCC-04	Microwave Cable 1-40G	Storm	421-011	RE	2005/01/05 * 12
MCC-23	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	RE	2004/06/12 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2005/01/10 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2004/02/24 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	RE	2004/08/29 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2004/12/16 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE,CE	2005/02/02 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	2004/02/24 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2005/02/04 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2005/02/04 * 12
MTA-07	Termination	MCL	BTRM-50	CE	2005/02/03 * 12

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

Test Item:

CE: Conducted emission
RE: Radiated emission

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APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/02/07 22:13:30

Applicant : SANYO Technosound Co., Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp/C/Humi% : 23 deg. C / 31%
Operator : Mitsuru Fujimura

Mode / Remarks : Transmitting : ch1 914.10MHz

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

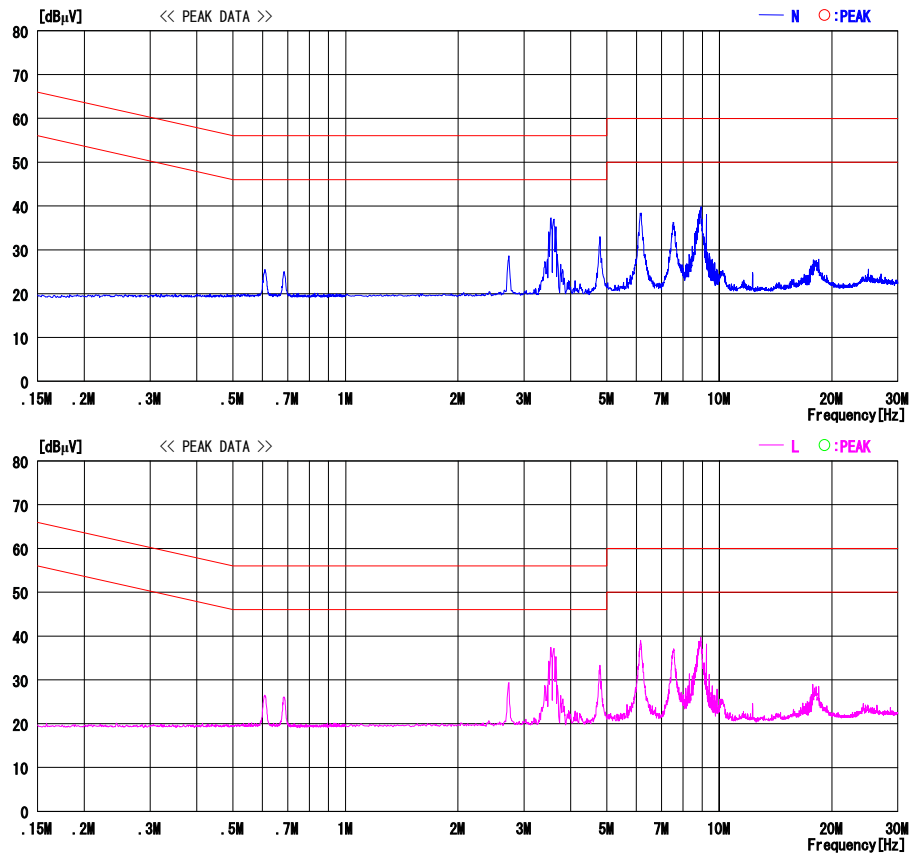


CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

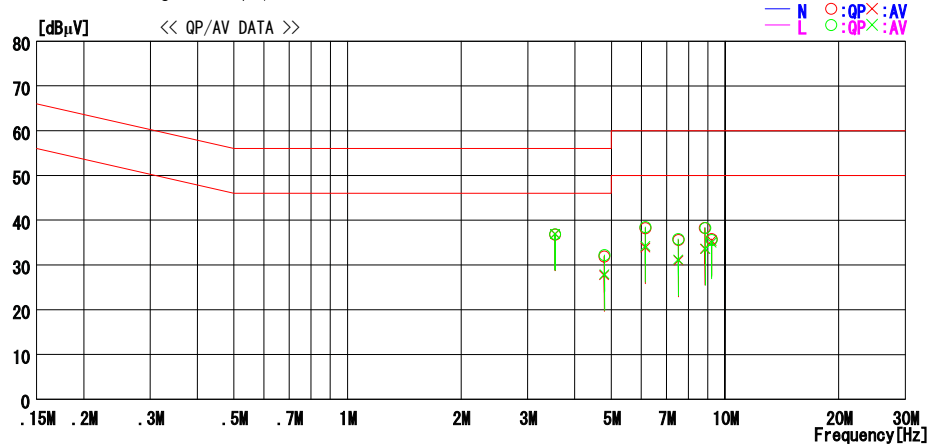
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/02/07 22:13:30

Applicant : SANYO Technosound Co.,Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp/C/Humi% : 23 deg. C / 31%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch1 914.10MHz

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



NO	FREQ [MHz]	READING		C. F	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
1	3.5480	36.4	36.5	0.4	36.8	36.9	56.0	46.0	19.2	9.1	N
2	4.7848	31.3	27.1	0.6	31.9	27.7	56.0	46.0	24.1	18.3	N
3	6.1517	37.6	33.3	0.6	38.2	33.9	60.0	50.0	21.8	16.1	N
4	7.5276	34.7	30.1	0.9	35.6	31.0	60.0	50.0	24.4	19.0	N
5	8.8406	37.4	32.7	0.9	38.3	33.6	60.0	50.0	21.7	16.4	N
6	9.2172	34.8	34.4	1.0	35.8	35.4	60.0	50.0	24.2	14.6	N
7	3.5484	36.5	36.5	0.4	36.9	36.9	56.0	46.0	19.1	9.1	L
8	4.7904	31.6	27.3	0.6	32.2	27.9	56.0	46.0	23.8	18.1	L
9	6.1542	37.9	33.6	0.6	38.5	34.2	60.0	50.0	21.5	15.8	L
10	7.5184	34.9	30.3	0.9	35.8	31.2	60.0	50.0	24.2	18.8	L
11	8.8755	37.4	32.7	0.9	38.3	33.6	60.0	50.0	21.7	16.4	L
12	9.2159	34.6	34.0	1.0	35.6	35.0	60.0	50.0	24.4	15.0	L

CHART: WITH FACTOR Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C. F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

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DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/02/07 21:53:00

Applicant : SANYO Technosound Co.,Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp°C/Humi% : 23 deg.C / 31%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch4 915.30MHz

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

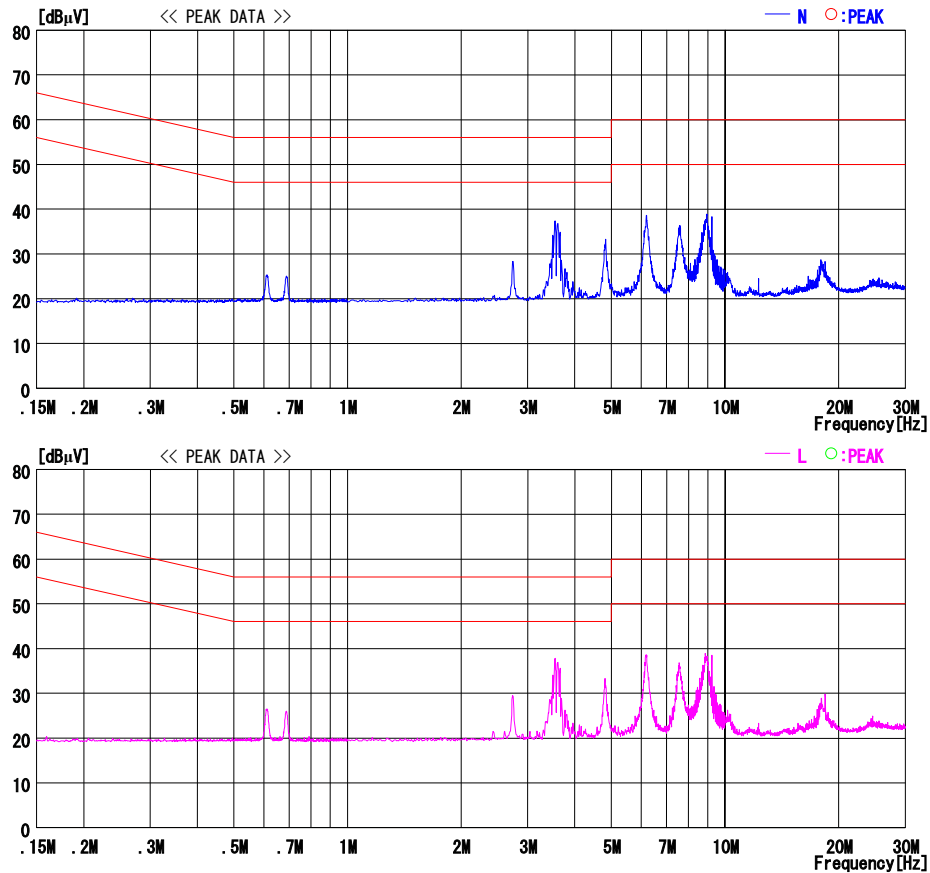


CHART:WITH FACTOR, Peak hold data, Data is uncorrected. CALCURATION: RESULT=READING+C. F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

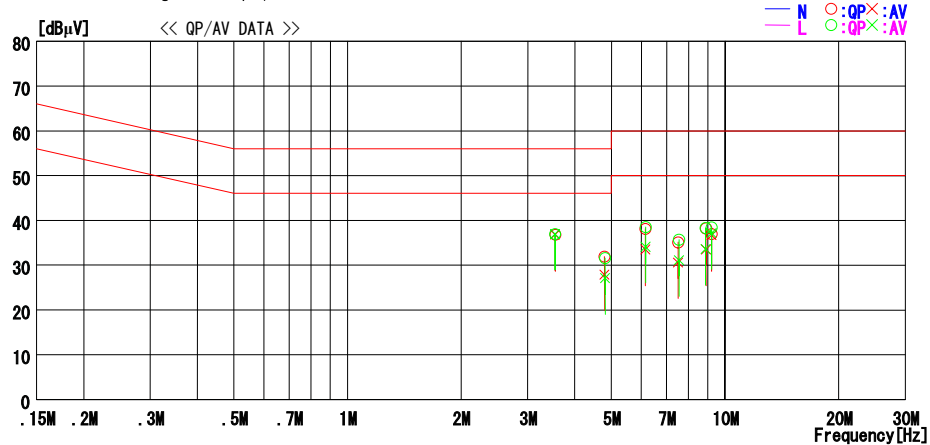
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/02/07 21:53:00

Applicant : SANYO Technosound Co.,Ltd.
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Mode / Remarks: Transmitting : ch4 915.30MHz

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



NO	FREQ [MHz]	READING		C. F	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
1	3.5487	36.4	36.4	0.4	36.8	36.8	56.0	46.0	19.2	9.2	N
2	4.7940	31.3	27.3	0.6	31.9	27.9	56.0	46.0	24.1	18.1	N
3	6.1505	37.5	32.9	0.6	38.1	33.5	60.0	50.0	21.9	16.5	N
4	7.5117	34.2	29.7	0.9	35.1	30.6	60.0	50.0	24.9	19.4	N
5	8.9037	37.3	32.6	0.9	38.2	33.5	60.0	50.0	21.8	16.5	N
6	9.2157	36.0	35.7	1.0	37.0	36.7	60.0	50.0	23.0	13.3	N
7	3.5481	36.6	36.6	0.4	37.0	37.0	56.0	46.0	19.0	9.0	L
8	4.8120	31.0	26.5	0.6	31.6	27.1	56.0	46.0	24.4	18.9	L
9	6.1632	37.9	33.5	0.6	38.5	34.1	60.0	50.0	21.5	15.9	L
10	7.5518	34.8	30.2	0.9	35.7	31.1	60.0	50.0	24.3	18.9	L
11	8.8803	37.4	32.7	0.9	38.3	33.6	60.0	50.0	21.7	16.4	L
12	9.2173	37.4	36.2	1.0	38.4	37.2	60.0	50.0	21.6	12.8	L

CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C. F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

DATA OF RADIATED EMISSION TEST

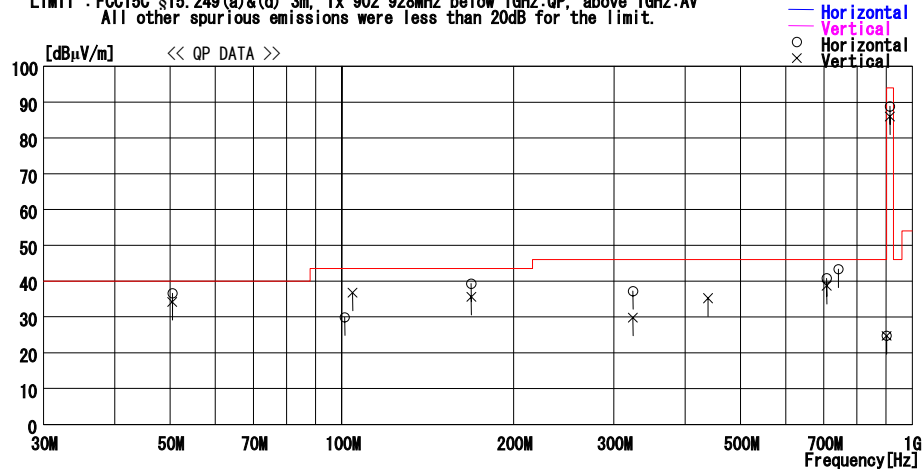
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Applicant : SANYO Technosound Co., Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp/C/Humi% : 23deg.C / 30%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch1 914.10MHz , Antenna Right 45deg

LIMIT : FCC15C §15.249(a)&(d) 3m, Tx 902~928MHz below 1GHz:QP, above 1GHz:AV
All other spurious emissions were less than 20dB for the limit.



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	50.452	47.7	10.0	6.6	27.7	36.6	40.0	3.4	400	50
2	101.256	39.9	10.6	7.0	27.6	29.9	43.5	13.6	280	269
3	168.763	42.3	16.8	7.5	27.3	39.3	43.5	4.2	184	314
4	324.011	40.2	15.7	8.2	26.9	37.2	46.0	8.8	100	48
5	708.761	38.4	20.6	9.9	28.1	40.8	46.0	5.2	124	288
6	742.513	40.2	21.1	10.1	28.1	43.3	46.0	2.7	122	238
7	902.000	20.0	21.9	10.6	27.7	24.8	46.0	21.2	112	166
8	914.112	83.8	22.1	10.7	27.8	88.8	94.0	5.2	112	166
Vertical										
9	50.455	45.3	10.0	6.6	27.7	34.2	40.0	5.8	252	253
10	104.454	46.4	11.0	7.0	27.6	36.8	43.5	6.7	100	251
11	168.757	38.6	16.8	7.5	27.3	35.6	43.5	7.9	100	360
12	324.008	32.8	15.7	8.2	26.9	29.8	46.0	16.2	165	257
13	438.763	35.5	18.7	8.9	27.9	35.2	46.0	10.8	156	313
14	708.763	36.3	20.6	9.9	28.1	38.7	46.0	7.3	150	336
15	902.000	19.9	21.9	10.6	27.7	24.7	46.0	21.3	121	188
16	914.109	81.0	22.1	10.7	27.8	86.0	94.0	8.0	121	188

CHART: WITH FACTOR ANT TYPE : 30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

Page:

UL Apex Co., Ltd.

Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

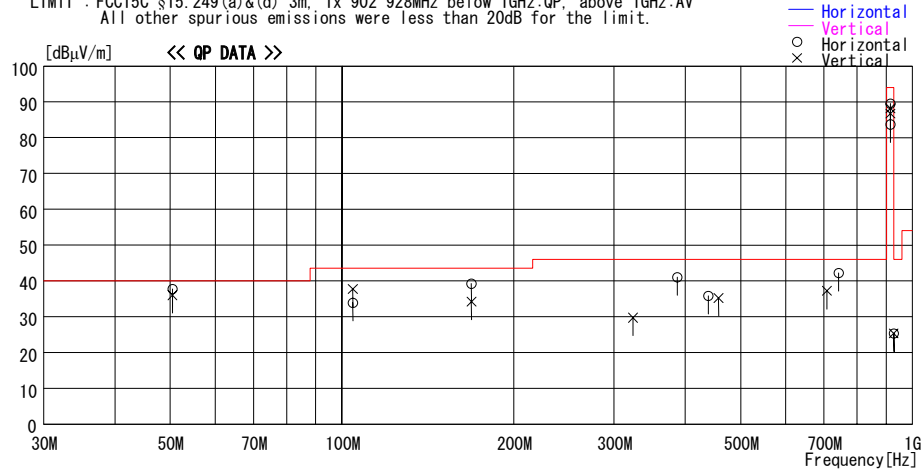
UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber

Applicant : SANYO Technosound Co., Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp/C/Humi% : 23deg.C / 30%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch4 915.30MHz , Antenna Right 45deg

LIMIT : FCC15C §15.249(a)&(d) 3m, Tx 902~928MHz below 1GHz:QP, above 1GHz:AV
All other spurious emissions were less than 20dB for the limit.



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	50.452	48.8	10.0	6.6	27.7	37.7	40.0	2.3	398	43
2	104.453	43.5	11.0	7.0	27.6	33.9	43.5	9.6	273	133
3	168.758	42.2	16.8	7.5	27.3	39.2	43.5	4.3	173	302
4	387.098	41.8	18.1	8.5	27.4	41.0	46.0	5.0	100	152
5	438.762	36.1	18.7	8.9	27.9	35.8	46.0	10.2	100	99
6	742.512	39.1	21.1	10.1	28.1	42.2	46.0	3.8	118	234
7	915.311	84.5	22.1	10.7	27.8	89.5	94.0	4.5	111	168
8	928.000	20.1	22.3	10.7	27.8	25.3	46.0	20.7	111	168

----- Vertical -----										
9	50.453	47.1	10.0	6.6	27.7	36.0	40.0	4.0	100	228
10	104.454	47.3	11.0	7.0	27.6	37.7	43.5	5.8	100	282
11	168.761	37.2	16.8	7.5	27.3	34.2	43.5	9.3	100	-1
12	324.010	32.7	15.7	8.2	26.9	29.7	46.0	16.3	107	6
13	457.660	35.4	18.8	8.9	27.9	35.2	46.0	10.8	103	335
14	708.763	34.8	20.6	9.9	28.1	37.2	46.0	8.8	115	299
15	915.310	83.2	22.1	10.7	27.8	88.2	94.0	5.8	117	187
16	928.000	20.1	22.3	10.7	27.8	25.3	46.0	20.7	119	187

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

DATA OF RADIATED EMISSION TEST

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

Applicant : SANYO Technosound Co., Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp°C/Humi% : 23deg.C / 30%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch1 914.10MHz , Antenna Right 45deg

LIMIT : FCC15C §15.249(a)&(d) 3m, Tx 902~928MHz below 1GHz:QP, above 1GHz:AV
All other spurious emissions were less than 20dB for the limit.

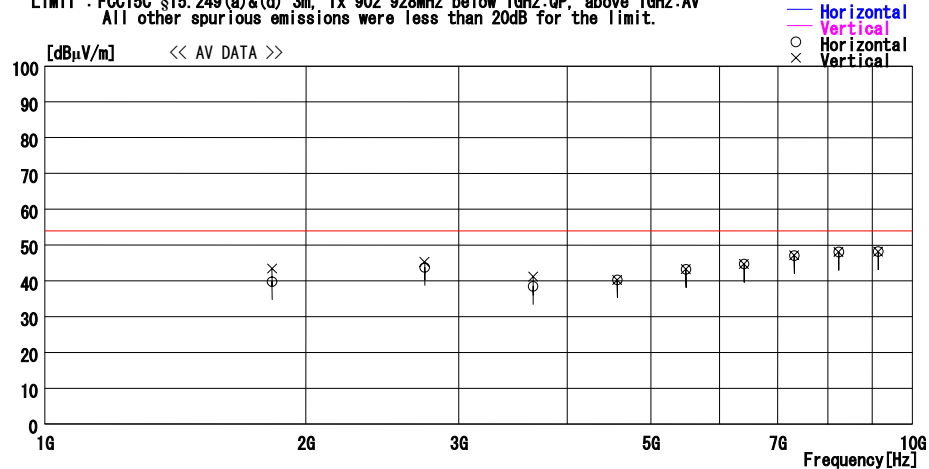


CHART:WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

Page:

UL Apex Co., Ltd.

Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

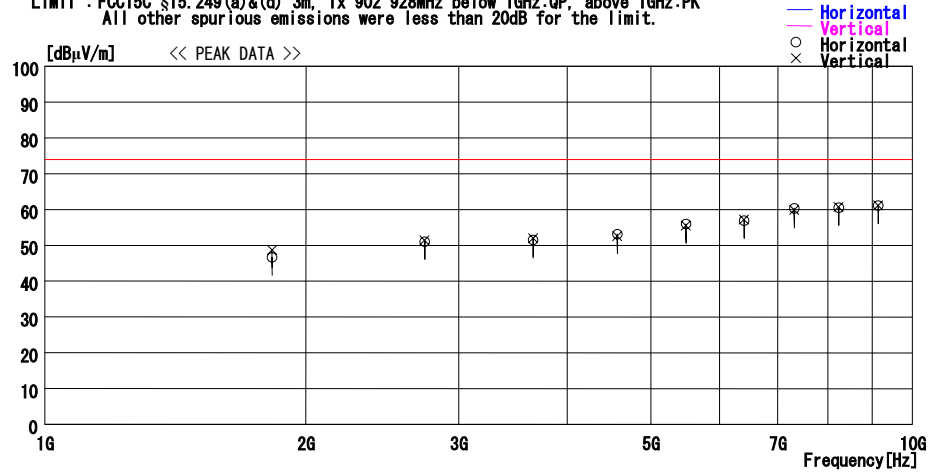
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : SANYO Technosound Co., Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp/C/Humi% : 23deg. C / 30%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch1 914.10MHz , Antenna Right 45deg

LIMIT : FCC15C §15.249(a)&(d) 3m, Tx 902~928MHz below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING PK [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
Horizontal										
1	1828.127	41.1	28.2	4.9	27.5	46.7	74.0	27.3	105	45
2	2742.300	41.2	31.2	5.9	27.3	51.0	74.0	23.0	100	45
3	3656.400	39.6	31.7	7.0	26.8	51.5	74.0	22.5	100	0
4	4570.500	38.1	33.7	7.8	26.4	53.2	74.0	20.8	100	0
5	5484.600	37.6	35.8	8.5	26.0	55.9	74.0	18.1	100	0
6	6398.700	36.6	36.6	9.3	25.6	56.9	74.0	17.1	100	0
7	7312.765	37.8	37.9	10.0	25.4	60.3	74.0	13.7	100	0
8	8226.900	38.2	36.9	10.8	25.3	60.6	74.0	13.4	100	0
9	9141.000	38.1	36.9	11.5	25.4	61.1	74.0	12.9	100	0
Vertical										
10	1828.176	43.2	28.2	4.9	27.5	48.8	74.0	25.2	100	225
11	2742.069	41.5	31.2	5.9	27.3	51.3	74.0	22.7	105	180
12	3656.499	40.1	31.7	7.0	26.8	52.0	74.0	22.0	140	45
13	4570.500	37.5	33.7	7.8	26.4	52.6	74.0	21.4	100	0
14	5484.600	37.3	35.8	8.5	26.0	55.6	74.0	18.4	100	0
15	6400.910	36.9	36.6	9.3	25.6	57.2	74.0	16.8	100	0
16	7312.800	37.4	37.9	10.0	25.4	59.9	74.0	14.1	100	0
17	8226.900	38.4	36.9	10.8	25.3	60.8	74.0	13.2	100	0
18	9141.540	38.1	36.9	11.5	25.4	61.1	74.0	12.9	100	0

CHART: WITH FACTOR ANT TYPE : 30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

DATA OF RADIATED EMISSION TEST

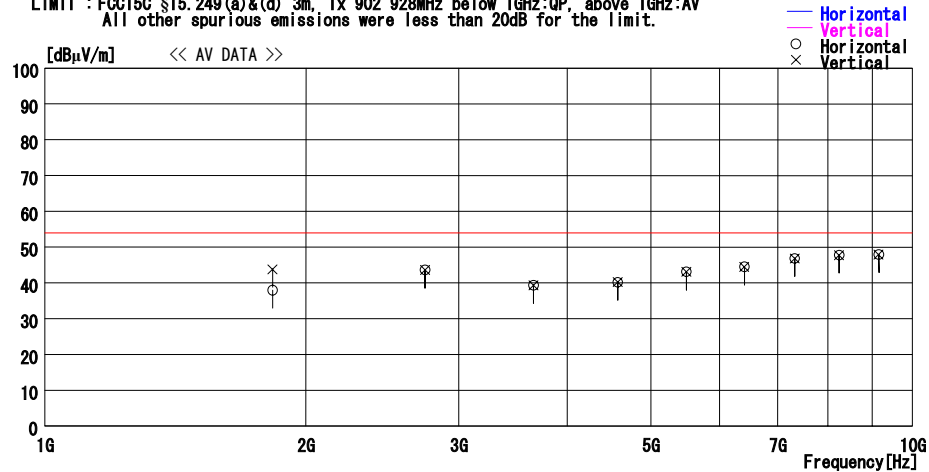
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : SANYO Technosound Co., Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp°C/Humi% : 23deg. C / 30%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch4 915.30MHz , Antenna Right 45deg

LIMIT : FCC15C §15.249(a)&(d) 3m, Tx 902~928MHz below 1GHz:QP, above 1GHz:AV
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING AV [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
Horizontal										
1	1830.653	32.3	28.3	4.9	27.5	38.0	54.0	16.0	105	45
2	2745.884	33.9	31.2	5.9	27.3	43.7	54.0	10.3	100	45
3	3661.200	27.5	31.7	7.0	26.8	39.4	54.0	14.6	100	265
4	4576.500	25.0	33.8	7.8	26.4	40.2	54.0	13.8	100	0
5	5491.800	24.7	35.8	8.5	25.9	43.1	54.0	10.9	100	0
6	6407.014	24.2	36.6	9.3	25.6	44.5	54.0	9.5	100	0
7	7322.400	24.4	37.9	10.0	25.4	46.9	54.0	7.1	100	0
8	8237.700	25.4	36.9	10.8	25.3	47.8	54.0	6.2	100	0
9	9153.000	25.0	36.9	11.5	25.4	48.0	54.0	6.0	100	0
Vertical										
10	1830.653	38.1	28.3	4.9	27.5	43.8	54.0	10.2	105	225
11	2745.884	33.8	31.2	5.9	27.3	43.6	54.0	10.4	105	180
12	3661.200	27.4	31.7	7.0	26.8	39.3	54.0	14.7	0	0
13	4576.500	25.0	33.8	7.8	26.4	40.2	54.0	13.8	0	0
14	5491.800	24.7	35.8	8.5	25.9	43.1	54.0	10.9	0	0
15	6407.014	24.2	36.6	9.3	25.6	44.5	54.0	9.5	0	0
16	7322.400	24.3	37.9	10.0	25.4	46.8	54.0	7.2	0	0
17	8237.700	25.4	36.9	10.8	25.3	47.8	54.0	6.2	0	0
18	9153.000	25.0	36.9	11.5	25.4	48.0	54.0	6.0	0	0

CHART: WITH FACTOR ANT TYPE : 30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

DATA OF RADIATED EMISSION TEST

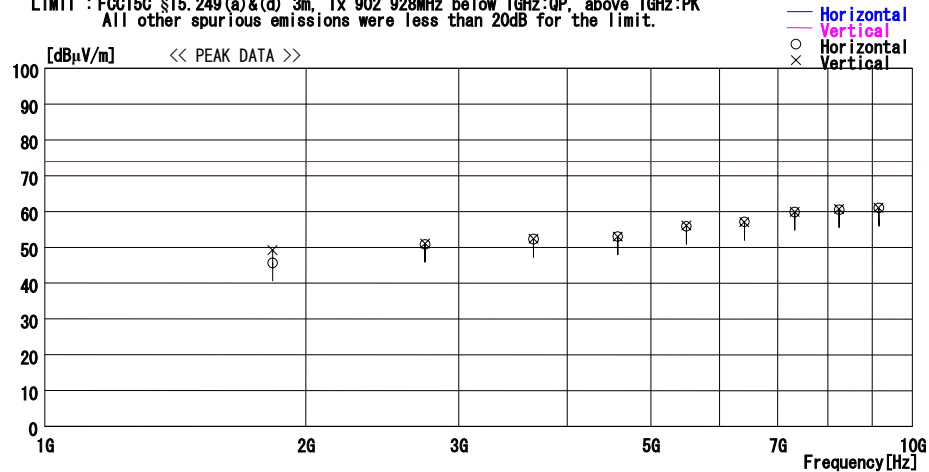
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : SANYO Technosound Co., Ltd.
Kind of EUT : DVD Home Theater System (Transmitter)
Model No. : DWM-4500
Serial No. : 1

Report No. : 25FE0237-HO
Power : AC120V / 60Hz
Temp°C/Humi% : 23deg. C / 30%
Operator : Mitsuru Fujimura

Mode / Remarks: Transmitting : ch4 915.30MHz , Antenna Right 45deg

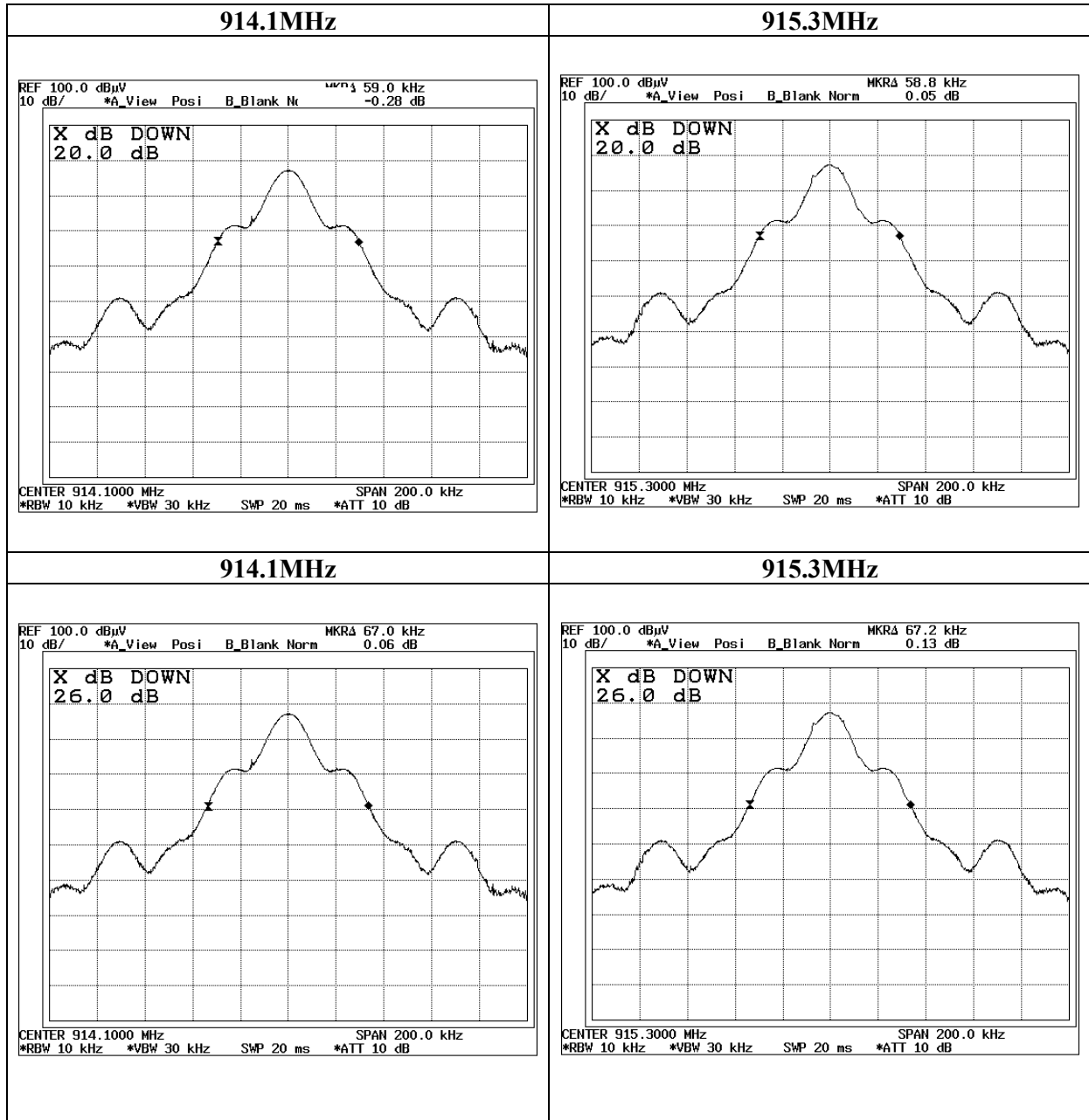
LIMIT : FCC15C §15.249(a)&(d) 3m, Tx 902~928MHz below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING PK [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
Horizontal										
1	1830.653	40.0	28.3	4.9	27.5	45.7	74.0	28.3	105	45
2	2745.884	41.0	31.2	5.9	27.3	50.8	74.0	23.2	100	45
3	3661.200	40.4	31.7	7.0	26.8	52.3	74.0	21.7	100	265
4	4576.500	37.8	33.8	7.8	26.4	53.0	74.0	21.0	100	0
5	5491.800	37.5	35.8	8.5	25.9	55.9	74.0	18.1	100	0
6	6407.014	36.9	36.6	9.3	25.6	57.2	74.0	16.8	100	0
7	7322.400	37.4	37.9	10.0	25.4	59.9	74.0	14.1	100	0
8	8237.700	38.1	36.9	10.8	25.3	60.5	74.0	13.5	100	0
9	9153.000	38.0	36.9	11.5	25.4	61.0	74.0	13.0	100	0
Vertical										
10	1830.563	43.5	28.3	4.9	27.5	49.2	74.0	24.8	105	225
11	2745.900	41.3	31.2	5.9	27.3	51.1	74.0	22.9	105	180
12	3661.200	40.4	31.7	7.0	26.8	52.3	74.0	21.7	0	0
13	4576.500	37.8	33.8	7.8	26.4	53.0	74.0	21.0	0	0
14	5491.800	37.7	35.8	8.5	25.9	56.1	74.0	17.9	0	0
15	6407.100	36.7	36.6	9.3	25.6	57.0	74.0	17.0	0	0
16	7322.400	37.4	37.9	10.0	25.4	59.9	74.0	14.1	0	0
17	8237.700	38.3	36.9	10.8	25.3	60.7	74.0	13.3	0	0
18	9153.000	38.1	36.9	11.5	25.4	61.1	74.0	12.9	0	0

CHART: WITH FACTOR ANT TYPE : 30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

-20dB&-26dB Bandwidth



Frequency Stability

Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: SANYO Technosound Co., Ltd.	REPORT NO	: 25FE0237-HO
EQUIPMENT	: DVD Home Theater System (Transmitter)	REGULATION	: Fcc Part15 Subpart C 15.31(e)
MODEL	: DWM-4500	DATE	: 02/07/2005
S/ N	: 1	TEMPERATURE	: 24°C
POWER	: AC120V / 60Hz	HUMIDITY	: 31%
MODE	: Transmitting	Engineer	: Mitsuru Fujimura

Voltage	Channel	Frequency[MHz]	MAX	MIN
AC102V(85%)	CH1	914.098862	914.098884	914.098852
	CH4	915.298966	915.299047	915.298933
AC120V(100%)	CH1	914.098852		
	CH4	915.299047		
AC138V(115%)	CH1	914.098884	0.0000035%	
	CH4	915.298933	0.0000125%	