



ADDENDUM EMI TEST REPORT

Test Report No. : 24HE0082-HO-3A

Applicant : Sony Corporation
Type of Equipment : Wireless LAN Module
Model No. : IRF302U
Test standard : FCC Part 15 Subpart E
Section 15.407 : 2004
FCC ID : AK8IRF302U
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:

June 14 , 2004 to June 25, 2004

Tested by:

Hiroka Umeyama
EMC Service

Approved by :

Hironobu Shimoi
Group Leader of
EMC Service

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Head Office EMC Lab.

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SECTION 1: Client information

Company Name : Sony Corporation
Address : Gate City Osaki West Tower Osaki East Tec.
1-11-1 Osaki Shinagawa-ku, Tokyo, 141-0032 Japan
Telephone Number : +81-3-5435-3977
Facsimile Number : +81-3-5436-3963
Contact Person : Masaki Nishimura

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125 (on Radiated and Conducted Emission Test)
77 (on Peak Transmit Power Test by Conducted)
11 (on Other Test by Conducted)
Rating : DC3.3V 0.81A
Country of Manufacture : Japan
Receipt Date of Sample : May 31, 2004
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

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2.2 Product Description

The Sony model IRF302U is ISM and UNII transceiver module that is designed to provide a Wireless LAN access using 802.11b/g/a protocols for data rates of up-to 54Mbps.

Normally the EUT is installed to Sony's "Wireless Location free TV" .

System clock : 40MHz

[W-LAN:IEEE802.11a]

Equipment Type	: Transceiver
Frequency of operation	: 5180-5320MHz / 5745-5805MHz
Channel Support	: 5180,5200,5220,5240,5260,5280,5300,5320MHz / 5745,5765,5785,5805MHz
Modulation Techniques	: OFDM
Channel number	: 12channels
Power control	: Non
Mode of operation	: Duplex
Antenna Type	: Patch Antenna
Antenna Gain	: 2.0dBi(MAX)
Antenna Connector Type	: U.FL
Operating voltage (inner)	: DC3.3V

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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 15.407(d) Antenna requirement

This EUT has the external (particular) antenna connector, and the installation is to be done by the professionals. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart E : 2004

Title : FCC 47CFR Part15 Radio Frequency Device
Subpart E Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	26dB Emission Bandwidth	ANSI C63.4:2003	Section 15.407(a)(1)(2)(3)	-	N/A	*See the worst margins in the data sheet in APPENDIX 3	Complied
2	Peak Transmit Power	ANSI C63.4:2003	Section 15.407(a)(1)(2)(3)	Conducted	N/A		Complied
3	Peak Power Spectral Density	ANSI C63.4:2003	Section 15.407(a)(1)(2)(3)	Conducted	N/A		Complied
4	Peak Excursion Ratio	ANSI C63.4:2003	Section 15.407(a)(6)	Conducted	N/A		Complied
5	Spurious Emission	ANSI C63.4:2003	Section 15.407(b)(1)(2)(3)(4)(5)	Conducted	N/A		Complied
6	Spurious Emission	ANSI C63.4:2003	(6)(7) 15.205/15.209	Radiated	N/A		Complied
7	AC Conducted Emission	ANSI C63.4:2003	Section 15.407(b)(6)/15.207	-	N/A		Complied
8	Band Edge Compliance	ANSI C63.4:2003	Section 15.407(b)(7)/15.205	Conducted Radiated	N/A		Complied

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

Uncertainty:

*In case of the margin below the EMC Head Office's uncertainty.

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 1.3\text{dB}$.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.5\text{dB}(3\text{m})/\pm 4.7\text{dB}(10\text{m})$.

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}(3\text{m})/\pm 3.8\text{dB}(10\text{m})$.

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 6.6\text{dB}$.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 3.0\text{dB}$.

*These tests were also referred to FCC Public Notice DA 02-2138 "Measurement Procedure Updated for Peak Transmit Power in the Unlicensed National Information Infrastructure (U-NII) Bands".

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

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3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	RSS210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	Conducted	N/A	N/A	N/A

3.4 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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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 shielded 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.

3.5 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 EUT was operating in a manner similar to typical use during the tests.

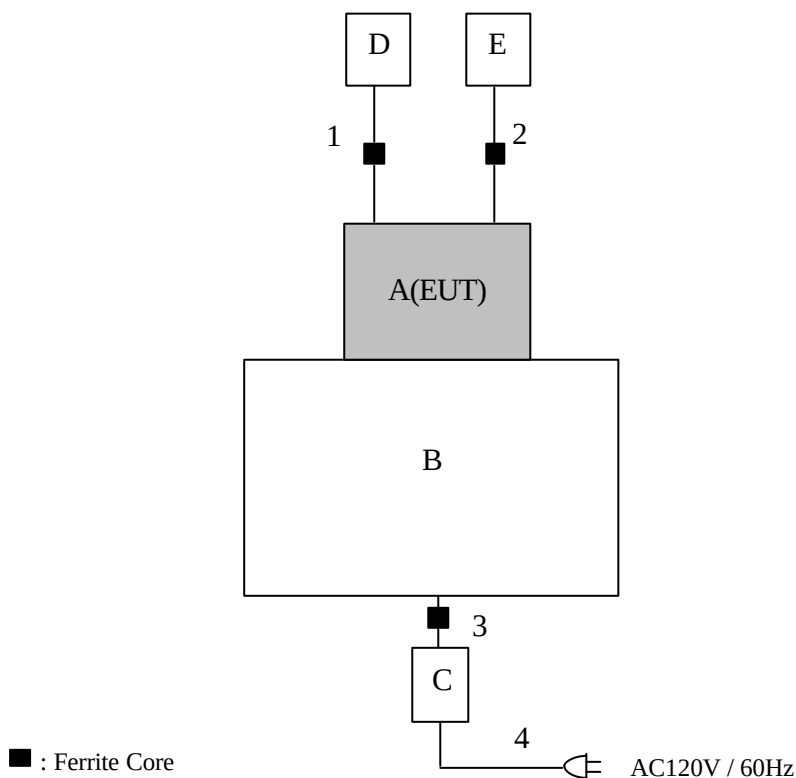
The mode is used : Transmitting mode (OFDM 54Mbps)
 Channel 36: 5180MHz
 Channel 52: 5260MHz
 Channel 64: 5320MHz
 Channel 149: 5745MHz
 Channel 153: 5765MHz
 Channel 161: 5805MHz

*The two antennas are the same one so that the test was made with one antenna of the two .

* The EUT has an ability to provide some different modulation and data rates. Some of these modulation and data rates did not change in the spectrum envelopes of the EUT at conducted Measurement with the antenna terminal. Therefore, the results of the final measurements were 54Mbps modulation as the highest data rate.

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

4.2 Configuration and peripherals



*The test was confirmed in the position of the maximum radiated emission level.

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Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Wireless LAN Module	IRF302U	125*1 77*2 11*3	SONY	AK8IRFU302U
B	Notebook Personal Computer	PP01L	CN-04P449- 48643-318-7190	DELL	-
C	AC Adaptor	ADP-70EB	TH-09364U- 17971-181-1SHK	DELL	-
D	Patch Antenna	SDA2452A	-	TOKO	-
E	Patch Antenna	SDA2452A	-	TOKO	-

*1:on Radiated and Conducted Emission Test

*2:on Peak Transmit Power Test by Conducted

*3:on Other Test by Conducted

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	Antenna Cable	0.04	Y	FEP
2	Antenna Cable	0.04	Y	FEP
3	DC Cable	1.8	N	Polyvinyl chloride
4	AC Cable	1.8	N	Polyvinyl chloride

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SECTION 5: Conducted Emission, Section 15.407(b)(5) / 15.207

Test Procedure

EUT was placed on a platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. 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 .

The EUT was set on the center of the table.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN /(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 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.

The measurements have been performed with a CISPR quasi-peak and average detector (IF BW 9 kHz).

Measurement range: 0.15-30MHz

We confirmed that there was no difference in the Peak and Average data (result) if the channels and the modes were changed. As the evidence, the plot data is attached in the test report.

Test data : APPENDIX 3

Test result : Pass

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SECTION 6: Spurious Emission , Band Edge Compliance 15.407(b)(1)(2)(3)(4)(6)(7)

[Conducted]

Test Procedure

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

Test data : APPENDIX 3

Test result : Pass

[Radiated]

Test Procedure

EUT was placed on a platform of nominal size, 0.5m by 0.5m, 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) , 1m (10-26.5GHz, Distance Factor : $20\log(3[m]/1[m])$) and 0.5m (Upper 26.5GHz, Distance Factor : $20\log(3[m]/0.5[m])$).

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.

Below 1GHz

The result also satisfied with the general limits specified in section 15.209(a).

Above 1GHz

Inside of the restricted bands (Section 15.205) : Apply to limit in the Section 15.209(a)

Outside of the restricted bands (Section 15.205) : Limit -27dBm EIRP
-17dBm EIRP (5.725-5.825GHz Band Edge)

Frequency	Below 1GHz	Above 1GHz (Inside of the restricted bands)	Above 1GHz (Outside of the restricted bands)
Instrument use	Test Receiver	Spectrum Analyzer	Spectrum Analyzer
Detector	QP: BW 120kHz	PK: RBW:1MHz/VBW: 1MHz	RBW:1MHz/VBW: 1MHz
IF Bandwidth		AV: RBW:1MHz/VBW:10Hz	

Test data : APPENDIX 3

Test result : Pass

*The noise from the EUT was not seen in the above 18GHz. The measurement was made in the residual noise levels.

*The test was also made in the long cable with ferrites : maximum length 20cm. The tests in the worst case conditions was made in the channel, data rate from 30MHz to 40GHz. The tests was compared in cable lengths. The test result had no difference affected by the cable length. See APPENDIX3 for Additional Data : Radiated Spurious Emission (long antenna cable).

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SECTION 7: 26dB Emission Bandwidth, Section 15.407(a)(1)(2)(3)

Test Procedure

The 26dB Emission Bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 8: Peak Transmit Power Section 15.407(a)(1)(2)(3)

Test Procedure

The Peak Transmit Power was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 9: Peak Power Spectral Density, Section 15.407 (a)(1)(2)(3)

Test Procedure

The Peak Power Spectral Density was measured with a spectrum analyzer connected to the antenna port.

We followed the method 3 specified in DA-02-2138A1.

The test was made with the spectrum analyzer that has a function of channel-power measurement.

It covers the EBW range, that is, 40MHz mask. Therefore, the correct peak conducted power is measured.

The test was made with VBW, 1MHz(more than 1/T : T is a period of EUT transmitting ON = 370usec.).

Test data	:	APPENDIX 3
Test result	:	Pass

SECTION 10: Peak Excursion Ratio, Section 15.407 (a)(6)

Test Procedure

The Peak Excursion Ratio was measured with a spectrum analyzer connected to the antenna port.

Test data	:	APPENDIX 3
Test result	:	Pass

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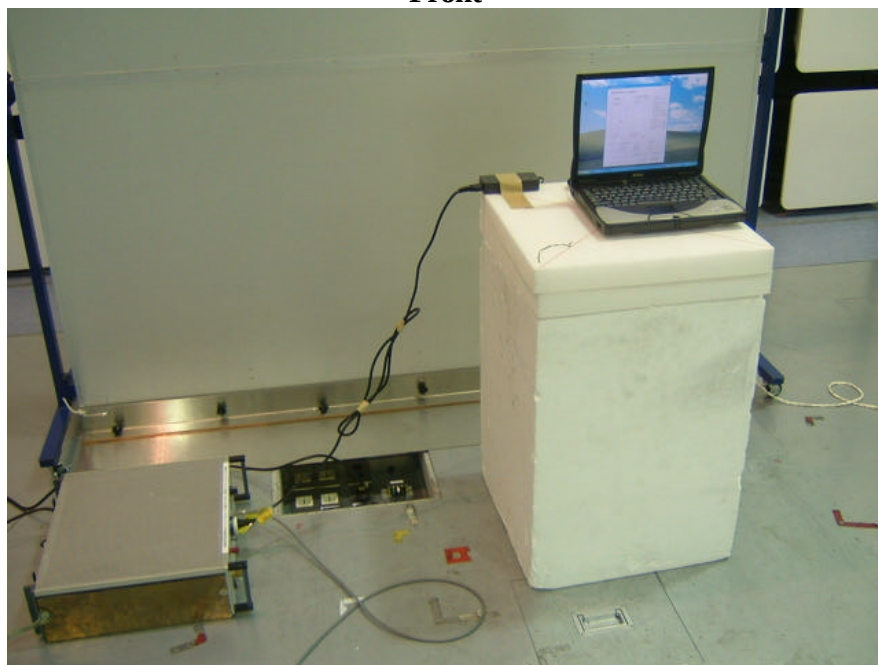
Facsimile : +81 596 24 8124

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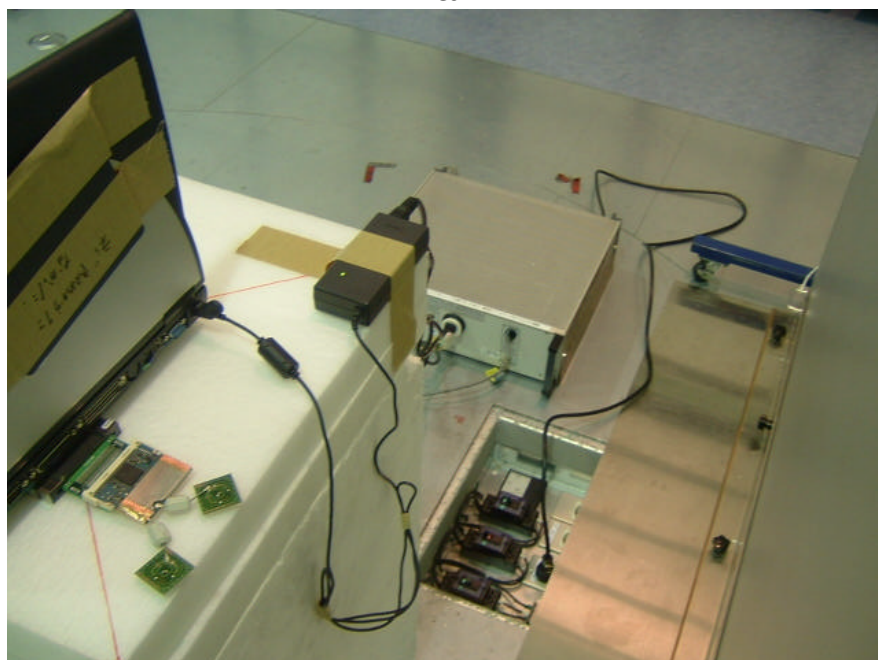
APPENDIX 1: Photographs of test setup

Conducted Emission

Front

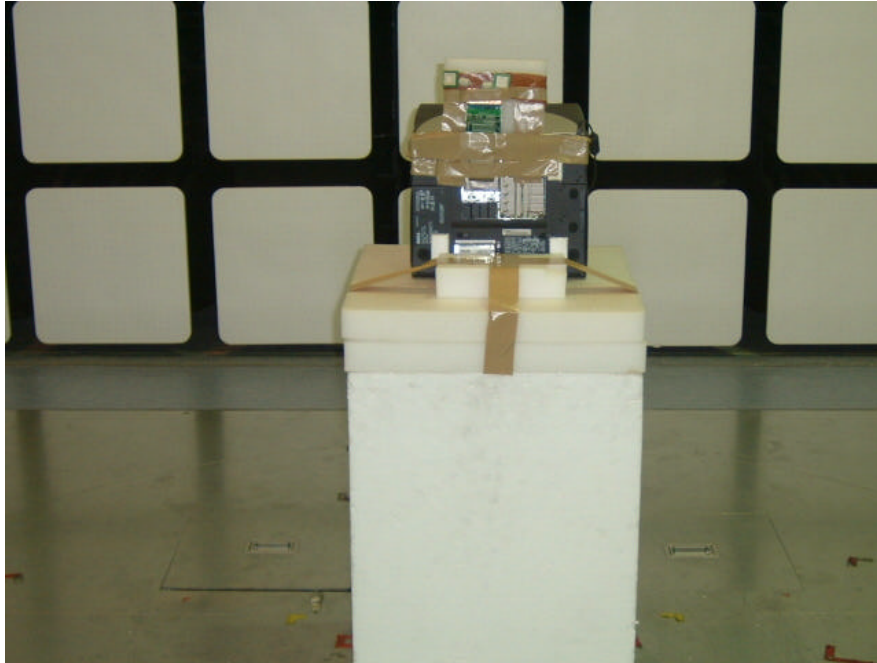


Rear

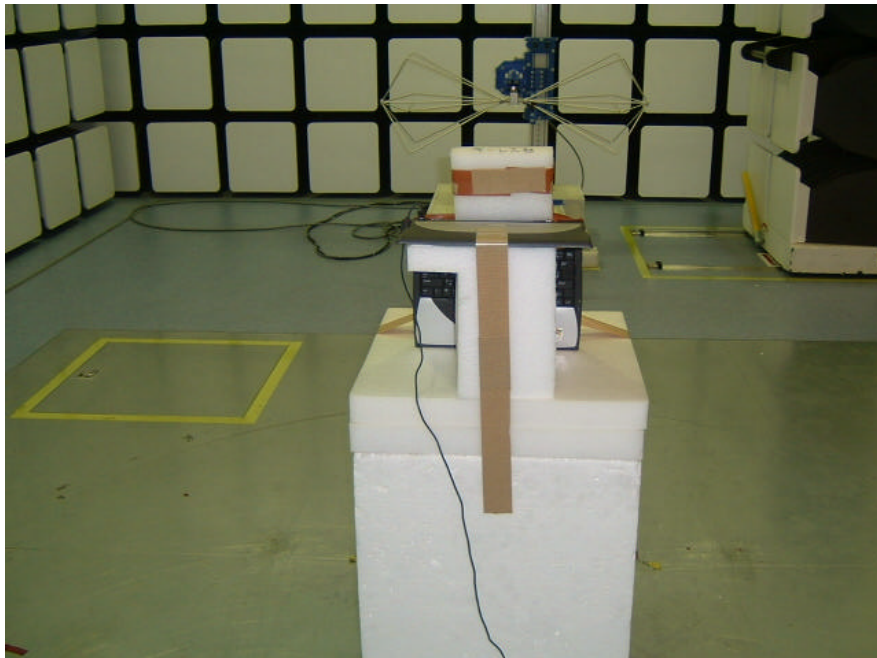


Spurious Emission (Radiated)

Front



Rear

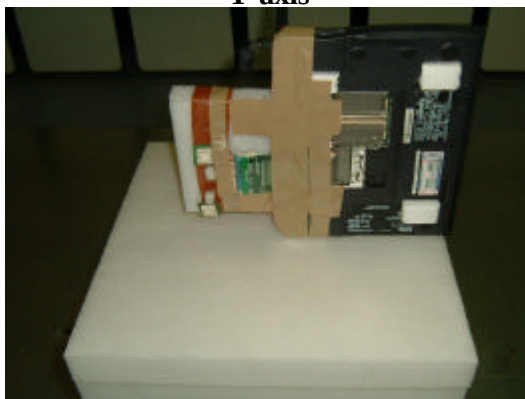


Worst Case Position (Z-axis:Horizontal / Z-axis:Vertical)

X-axis



Y-axis



Z-axis



APPENDIX 2:Test instruments

EMI test equipment (Conducted Emission)

Control No.	Instrument	Manufacturer	Model No	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	2004/04/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	2004/02/03 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	2004/02/18 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	2004/02/24 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	2004/02/17 * 12

EMI test equipment (Spurious Emission and Band Edge Compliance(Radiated))

Control No.	Instrument	Manufacturer	Model No	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	2004/04/12 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	2004/02 /18 * 12
MCC-04	Microwave Cable	Storm	421-011	2004/01/06 * 12
MCC-24	Microwave Cable	Storm	-	2004/05/01 * 12
MCC-25	Microwave Cable	Suhner	SUCOFLEX10 4	2003/06/30 * 12
MPA-01	Pre Amplifier	Agilent	8449B	2004/02/06 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	2004/06/12 * 12
MBF-03	SHF Bandpass Filter	M-City	13GHz BPF	2004/05/21 * 12
MHA-02	Horn Antenna	EMCO	3160-09	2004/01/10 * 12
MHA-04	Horn Antenna	EMCO	3160-10	2004/01/10 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	2004/01/10 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	2004/06/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ES140	2003/11/12 * 12
MCC-12	Coaxial Cable	Suhner/storm/Agilent/TSJ	-	2003/12/19 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	2003/10/15 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	2003/10/15 * 12
MPA-02	Pre Amplifier	Agilent	8447D	2004/05/25 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	2003/12/16 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	2003/09/19 * 12

EMI test equipment (Other)

Control No.	Instrument	Manufacturer	Model No	Calibration Date * Interval(month)
MSA-03	Spectrum Analyzer	Agilent	E4448A	2004/06/12 * 12
MAT-22	Attenuator (10dB)	Orient Microwave	BX10-0476-00	2004/03/30 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	2004/02/18 * 12

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

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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 : 2004/06/24 01:50:04

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : I25
Report No. : 24HE0082-HO
Power : DC 3.3V(PC INPUT: AC120V/60Hz)
Temp°C/Humi% : 20deg.C / 61%
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps ch153(5765MHz)

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	0.1818	49.1	36.0	0.1	49.2	36.1	64.4	54.4	15.2	18.3	N
2	0.2417	40.1	----	0.1	40.2	----	62.0	----	21.8	----	N
3	0.3016	35.8	----	0.1	35.9	----	60.2	----	24.3	----	N
4	0.5420	26.4	----	0.1	26.5	----	56.0	----	29.5	----	N
5	3.0162	24.8	----	1.0	25.8	----	56.0	----	30.2	----	N
6	4.9464	27.4	----	1.1	28.5	----	56.0	----	27.5	----	N
7	7.2062	38.5	----	1.2	39.7	----	60.0	----	20.3	----	N
8	7.8170	37.6	----	1.3	38.9	----	60.0	----	21.1	----	N
9	14.4074	28.8	----	1.5	30.3	----	60.0	----	29.7	----	N
10	15.6330	24.8	----	1.5	26.3	----	60.0	----	33.7	----	N
11	0.1818	48.9	35.3	0.1	49.0	35.4	64.4	54.4	15.4	19.0	L
12	0.2417	40.1	----	0.1	40.2	----	62.0	----	21.8	----	L
13	0.3016	36.1	----	0.1	36.2	----	60.2	----	24.0	----	L
14	0.5420	28.2	----	0.1	28.3	----	56.0	----	27.7	----	L
15	3.0162	26.4	----	1.0	27.4	----	56.0	----	28.6	----	L
16	4.9487	28.3	----	1.1	29.4	----	56.0	----	26.6	----	L
17	7.1972	39.1	----	1.2	40.3	----	60.0	----	19.7	----	L
18	7.8170	37.4	----	1.3	38.7	----	60.0	----	21.3	----	L
19	14.3909	29.6	----	1.5	31.1	----	60.0	----	28.9	----	L
20	15.6330	24.5	----	1.5	26.0	----	60.0	----	34.0	----	L

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 : 2004/06/24 01:19:54

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V(PC INPUT: AC120V/60Hz)
Temp°C/Humi% : 20deg.C / 61%
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps ch 36(5180MHz)

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

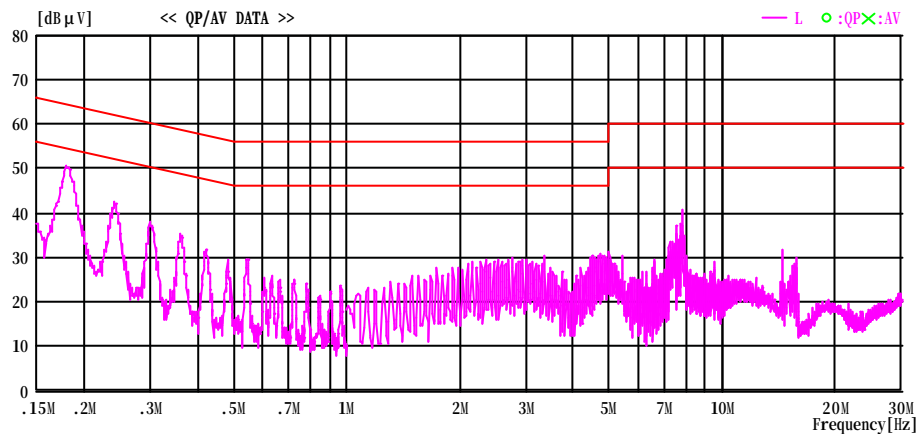
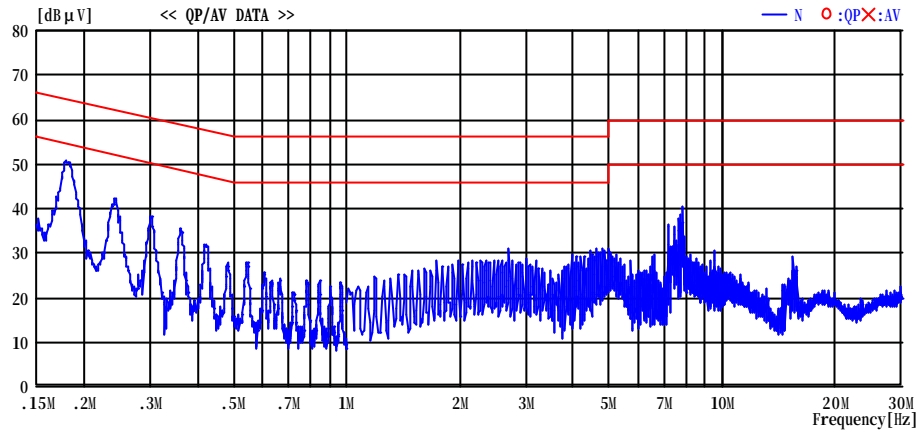


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/24 01:30:23

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V(PC INPUT: AC120V/60Hz)
Temp°C/Humi% : 20deg.C / 61%
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps ch 52(5260MHz)

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

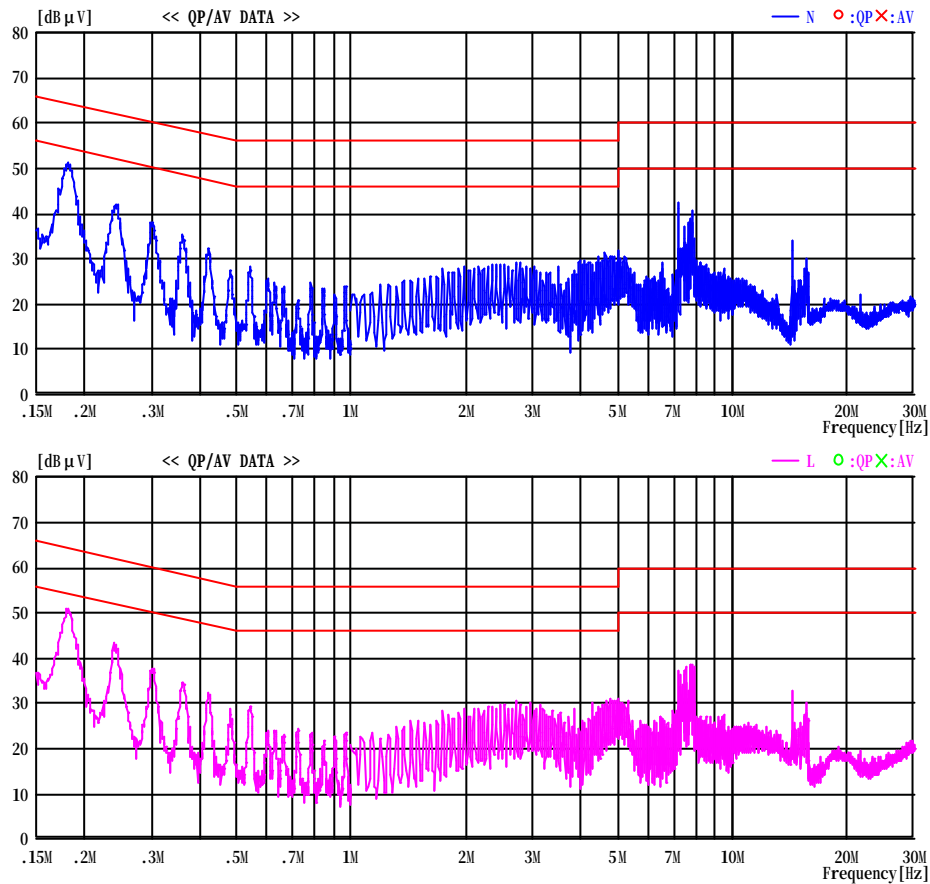


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/24 01:37:09

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V(PC INPUT: AC120V/60Hz)
Temp°C/Humi% : 20deg.C / 61%
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps ch 64(5320MHz)

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

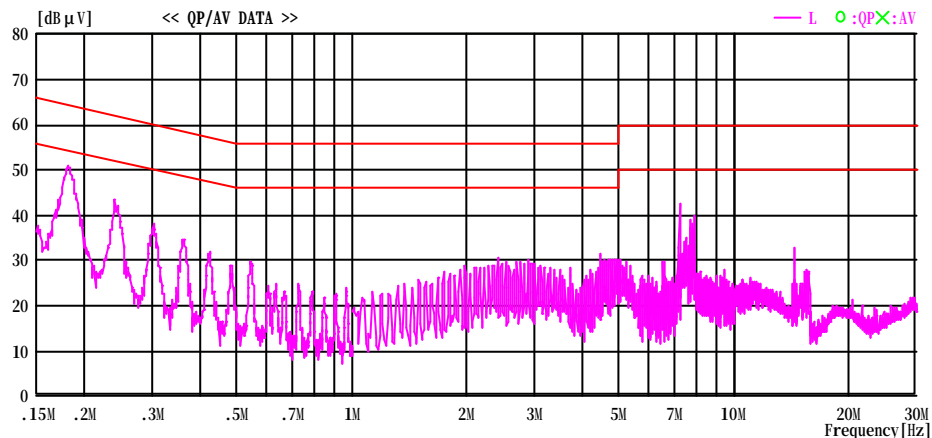
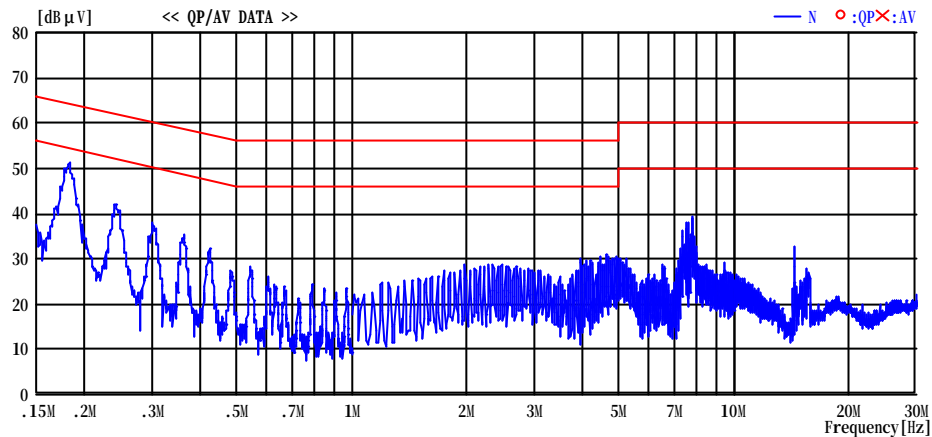


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/24 01:43:03

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V(PC INPUT: AC120V/60Hz)
Temp°C/Humi% : 20deg.C / 61%
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps ch149(5745MHz)

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

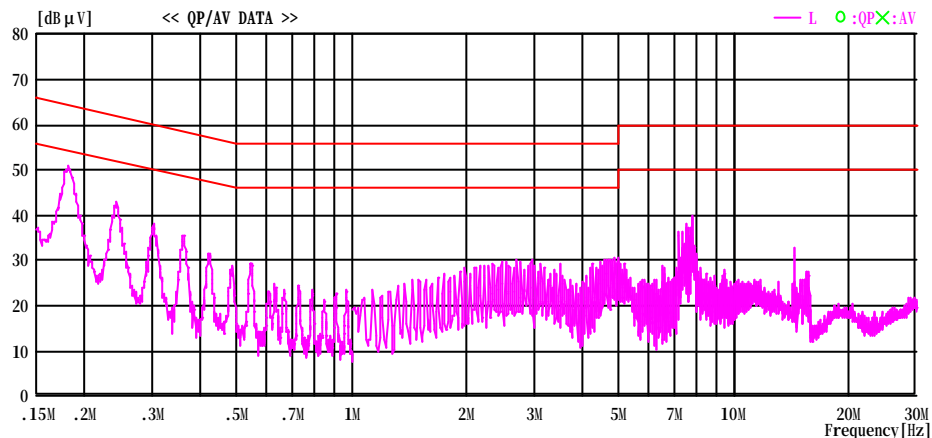
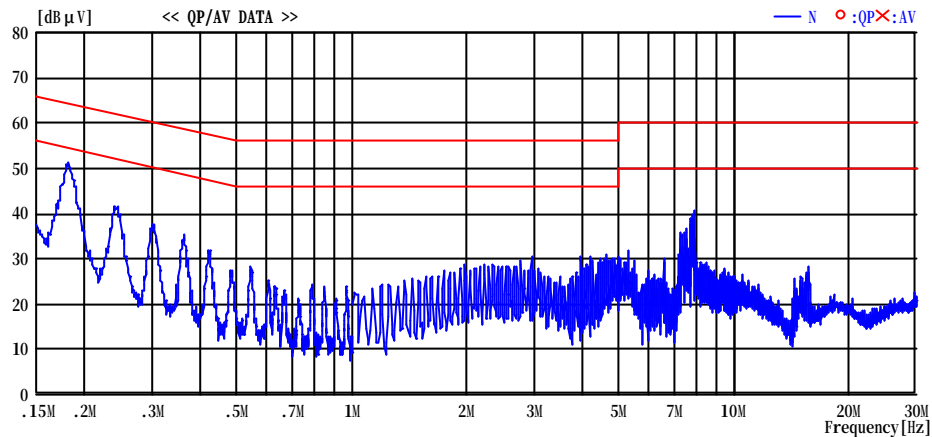


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/24 01:50:04

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V(PC INPUT: AC120V/60Hz)
Temp°C/Humi% : 20deg.C / 61%
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps ch153(5765MHz)

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

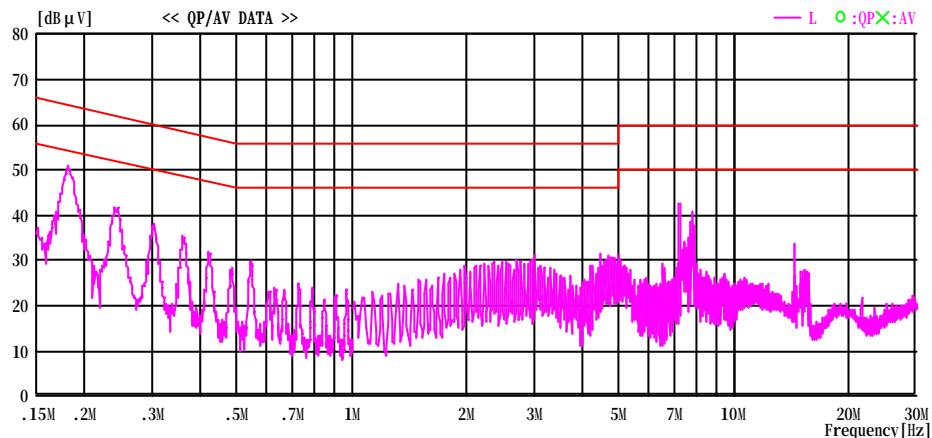
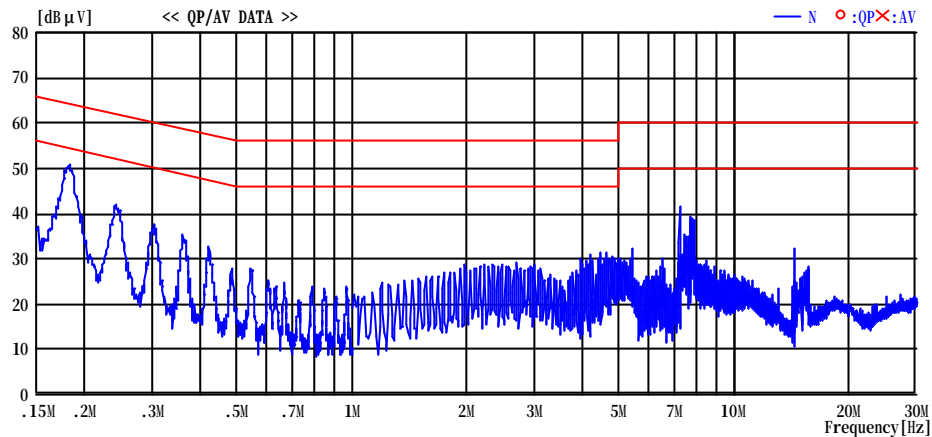


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/24 01:59:04

Applicant

Kind of EUT

Model No.

Serial No.

: Sony Corporation

: Wireless LAN Module

: IRE302U

: 125

Report No.

Power

Temp°C/Humi%

Operator

: 24HE0082-H0

: DC 3.3V(PC INPUT: AC120V/60Hz)

: 20deg.C / 61%

: Hiroka Umeyama

Mode / Remarks

: Transmitting IEEE802.11a, 54Mbps ch16(5805MHz)

LIMIT : FCC15C

FCC15C

§ 15.207 (QP)

§ 15.207 (AV)

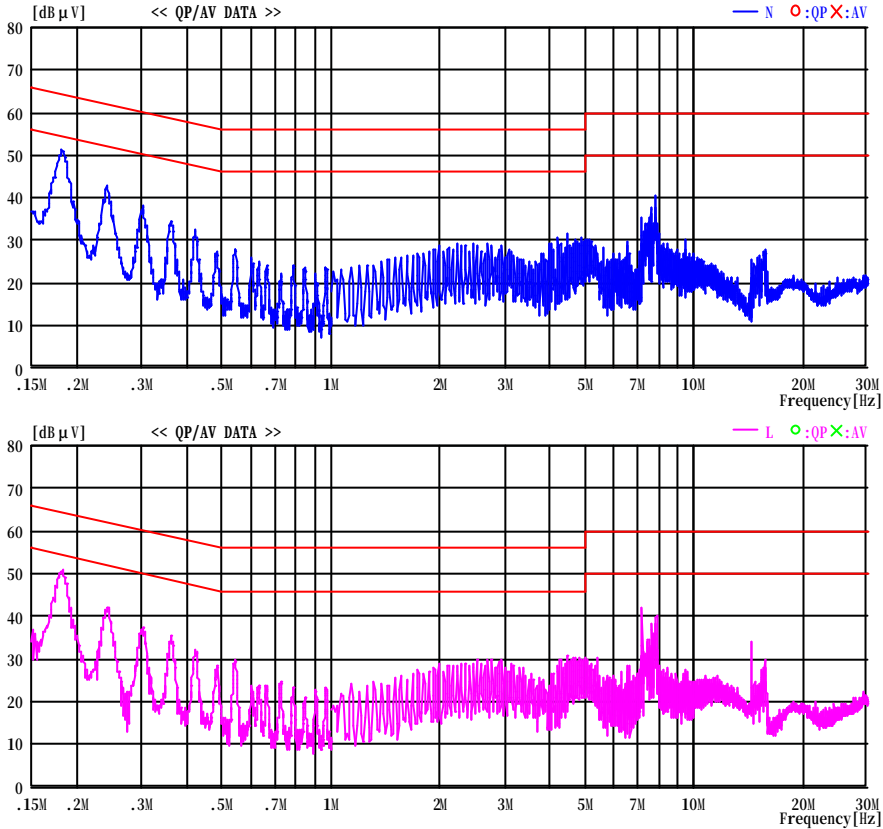


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

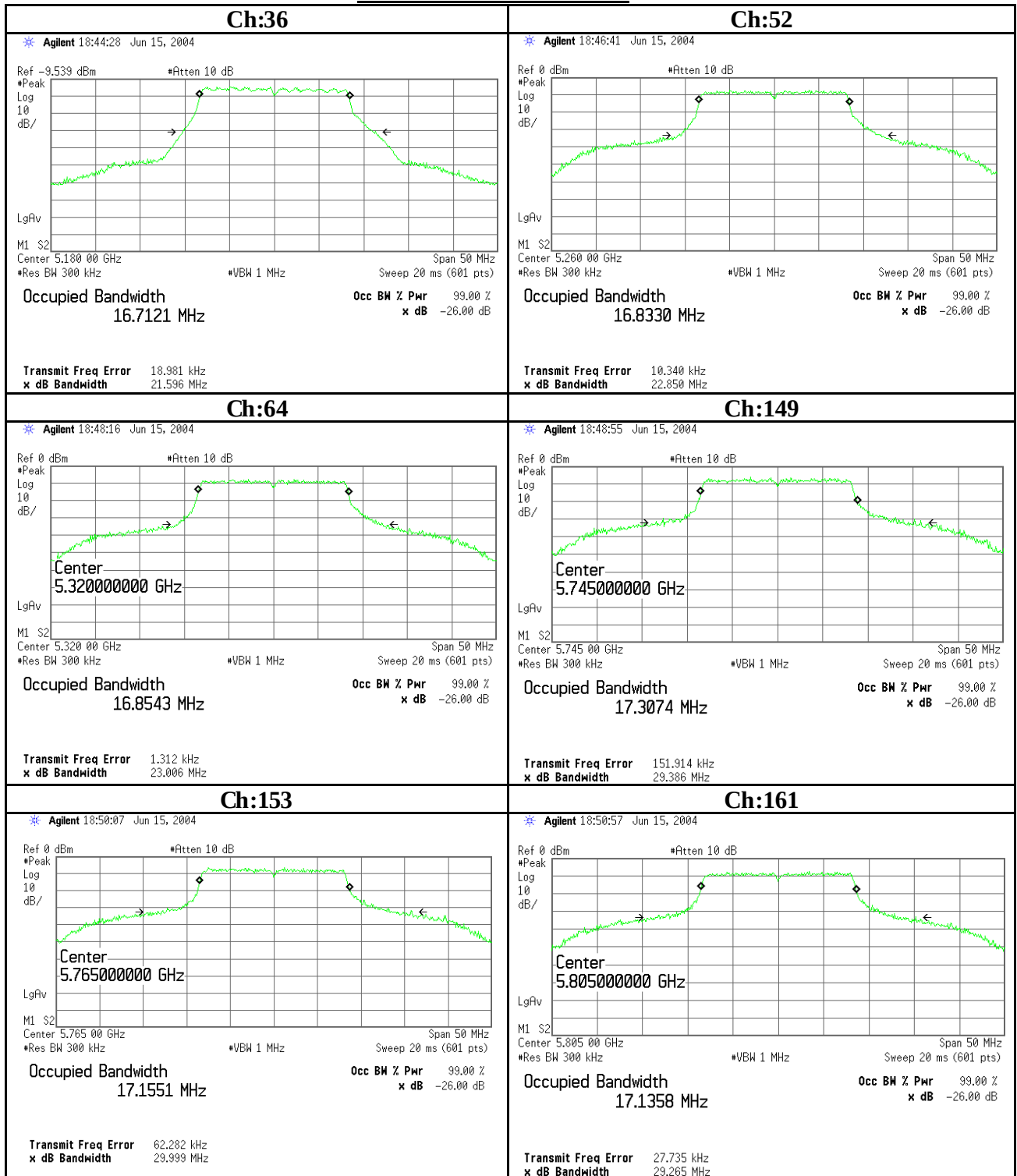
26dB Emission Bandwidth

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

Company	: Sony Corporation	REPORT NO	: 24HE0082-HO
Equipment	: Wireless LAN Module	REGULATION	: FCC 15.407(a)(1)(2)(3)
Model	: IRF302U	TEST DISTANCE	: -
Sample No.	: 11	DATE	: 06/15/2004
Power	: DC3.3V	TEMPERATURE	: 25deg.C
Mode	: Tx IEEE 802.11a 54Mbps	HUMIDITY	: 48%
		ENGINEER	: Hiroka Umeyama

Ch	Freq. [MHz]	26dB Bandwidth [MHz]	Limit [MHz]
36	5180.0	21.596	-
52	5260.0	22.850	-
64	5320.0	23.006	-
149	5745.0	29.386	-
153	5765.0	29.999	-
161	5805.0	29.265	-

26dB Emission Bandwidth



Peak Transmit Power

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

Company : Sony Corporation
Equipment : Wireless LAN Module
Model : IRF302U
Sample No. : 77
Power : DC3.3V
Mode : Tx IEEE 802.11a 54Mbps

REPORT NO : 24HE0082-HO
REGULATION : FCC 15.407(a)(1)(2)(3)
TEST DISTANCE : -
DATE : 06/25/2004
TEMPERATURE : 25deg.C
HUMIDITY : 60%
ENGINEER : Hiroka Umeyama

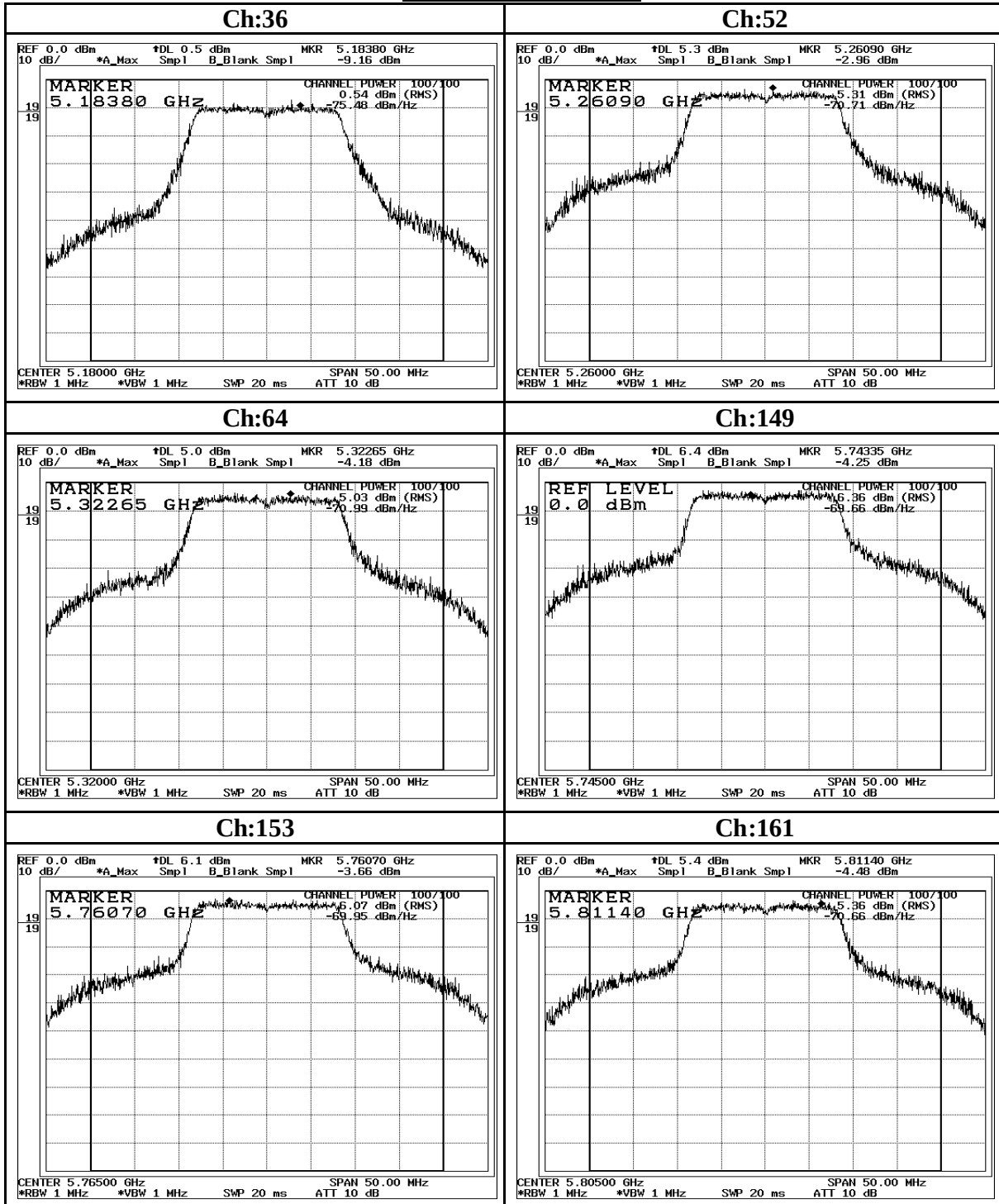
Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
36	5180.0	0.54	0.21	10.0	10.75	17.0	6.3
52	5260.0	5.31	0.21	10.0	15.52	24.0	8.5
64	5320.0	5.03	0.21	10.0	15.24	24.0	8.8
149	5745.0	6.36	0.22	10.0	16.58	30.0	13.4
153	5765.0	6.07	0.22	10.0	16.29	30.0	13.7
161	5805.0	5.36	0.22	10.0	15.58	30.0	14.4

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

Peak Transmit Power



Radiated Spurious Emission (below 1GHz)

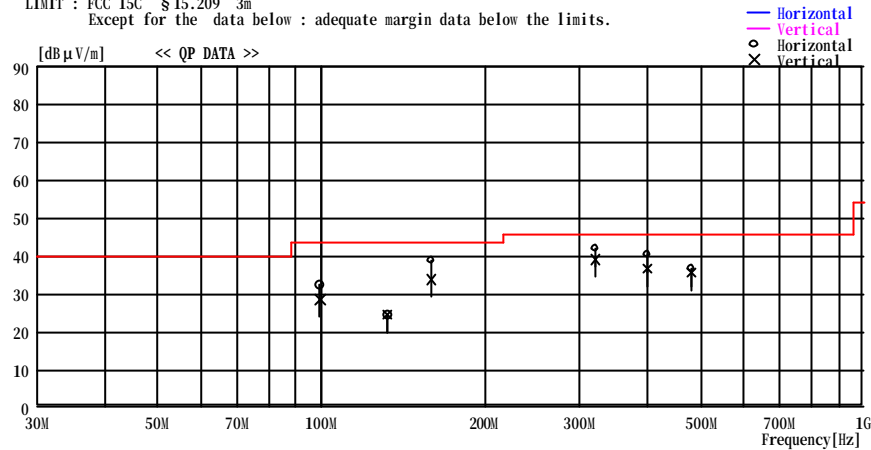
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/13 14:04:30

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125
Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 27 deg.C. / 44 %
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch 36(5180MHz) HOR:X-Axis,VER:Z-Axis(MAX)

LIMIT : FCC 15C §15.209 3m
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dB μV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μV/m]	LIMIT [dB μV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	99.699	38.0	10.1	7.2	23.0	32.3	43.5	11.2	315	65
2	132.938	26.2	13.7	7.4	23.0	24.3	43.5	19.2	166	90
3	160.000	39.0	15.2	7.6	23.0	38.8	43.5	4.7	239	258
4	320.001	41.5	14.9	8.4	22.9	41.9	46.0	4.1	100	259
5	400.004	35.9	18.3	8.9	22.8	40.3	46.0	5.7	100	279
6	480.003	32.0	18.3	9.2	22.9	36.6	46.0	9.4	208	115
----- Vertical -----										
7	99.698	34.2	10.1	7.2	23.0	28.5	43.5	15.0	100	115
8	132.960	26.4	13.7	7.4	23.0	24.5	43.5	19.0	100	360
9	160.002	34.0	15.2	7.6	23.0	33.8	43.5	9.7	100	277
10	320.000	38.8	14.9	8.4	22.9	39.2	46.0	6.8	139	309
11	400.004	32.3	18.3	8.9	22.8	36.7	46.0	9.3	115	262
12	480.000	31.2	18.3	9.2	22.9	35.8	46.0	10.2	100	0

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

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/13 14:04:30

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 27 deg.C. / 44 %
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch 52(5260MHz) HOR:X-Axis,VER:Z-Axis(MAX)

LIMIT : FCC 15C §15.209 3m

Except for the data below : adequate margin data below the limits.

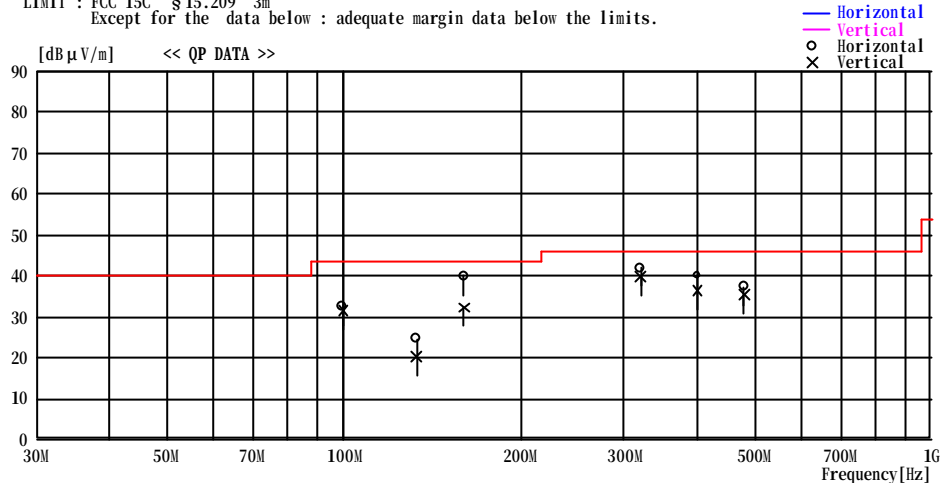


CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/13 14:04:30

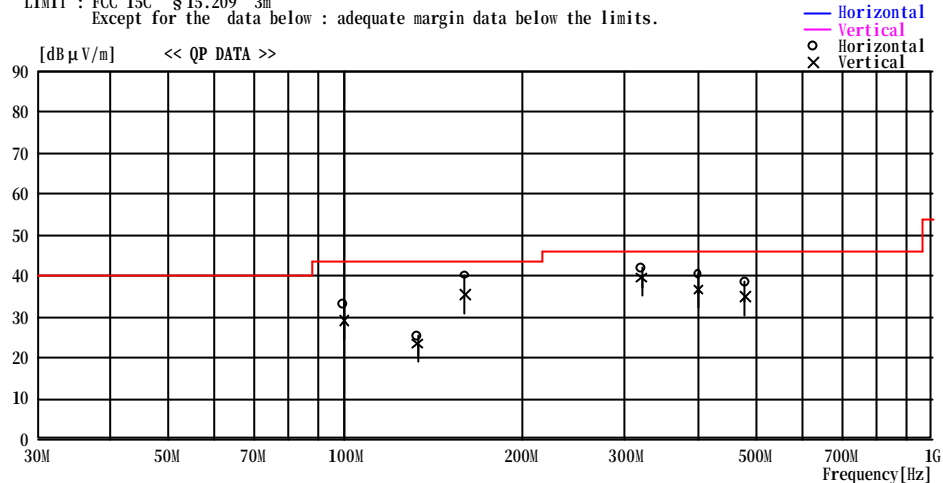
Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 27 deg.C. / 44 %
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch 64(5320MHz) HOR:X-Axis,VER:Z-Axis(MAX)

LIMIT : FCC 15C §15.209 3m

Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dB μ V]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	99.710	38.8	10.1	7.2	23.0	33.1	43.5	10.4	307	70
2	132.973	27.1	13.7	7.4	23.0	25.2	43.5	18.3	194	272
3	160.011	40.3	15.2	7.6	23.0	40.1	43.5	3.4	136	253
4	320.004	41.5	14.9	8.4	22.9	41.9	46.0	4.2	100	103
5	400.004	36.0	18.3	8.9	22.8	40.4	46.0	5.6	100	264
6	480.005	33.8	18.3	9.2	22.9	38.4	46.0	7.6	210	117
----- Vertical -----										
7	99.699	34.8	10.1	7.2	23.0	29.1	43.5	14.5	100	0
8	132.914	25.3	13.7	7.4	23.0	23.4	43.5	20.1	100	0
9	160.005	35.6	15.2	7.6	23.0	35.4	43.5	8.1	100	277
10	320.006	39.2	14.9	8.4	22.9	39.6	46.0	6.4	143	339
11	400.006	32.2	18.3	8.9	22.8	36.6	46.0	9.4	120	273
12	480.000	30.3	18.3	9.2	22.9	34.9	46.0	11.1	100	0

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

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/13 14:04:30

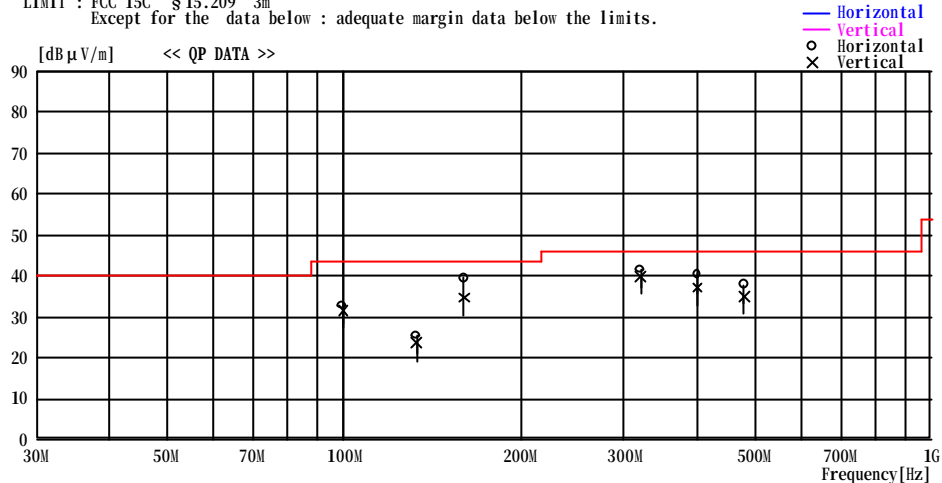
Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 27 deg.C. / 44 %
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch 149(5745MHz) HOR:X-Axis, VER:Z-Axis(MAX)

LIMIT : FCC 15C §15.209 3m

Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dB μ V]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	99.697	38.5	10.1	7.2	23.0	32.8	43.5	10.7	308	59
2	132.964	27.4	13.7	7.4	23.0	25.5	43.5	18.0	148	72
3	160.016	39.6	15.2	7.6	23.0	39.4	43.5	4.1	164	235
4	319.999	41.1	14.9	8.4	22.9	41.5	46.0	4.5	100	90
5	400.000	36.1	18.3	8.9	22.8	40.5	46.0	5.6	100	262
6	480.001	33.2	18.3	9.2	22.9	37.8	46.0	8.2	214	111
----- Vertical -----										
7	99.712	37.4	10.1	7.2	23.0	31.7	43.5	11.8	100	108
8	132.959	25.7	13.7	7.4	23.0	23.8	43.5	19.7	100	0
9	160.007	34.9	15.2	7.6	23.0	34.7	43.5	8.8	100	280
10	320.000	39.6	14.9	8.4	22.9	40.0	46.0	6.0	144	320
11	400.006	32.8	18.3	8.9	22.8	37.2	46.0	8.8	111	269
12	480.007	30.5	18.3	9.2	22.9	35.1	46.0	10.9	100	7

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

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/13 14:04:30

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 27 deg.C. / 44 %
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch 153(5765MHz) HOR:X-Axis,VER:Z-Axis(MAX)

LIMIT : FCC 15C §15.209 3m
Except for the data below : adequate margin data below the limits.

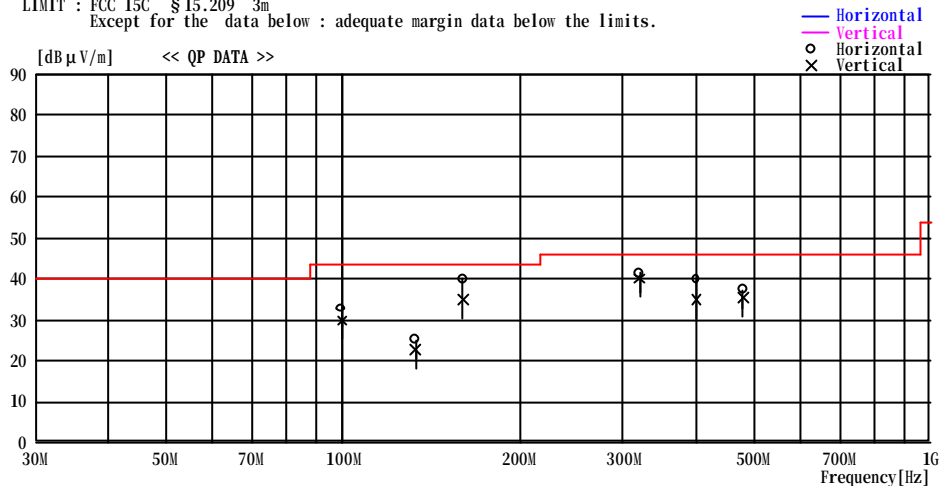


CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

DATA OF RADIATED EMISSION TEST

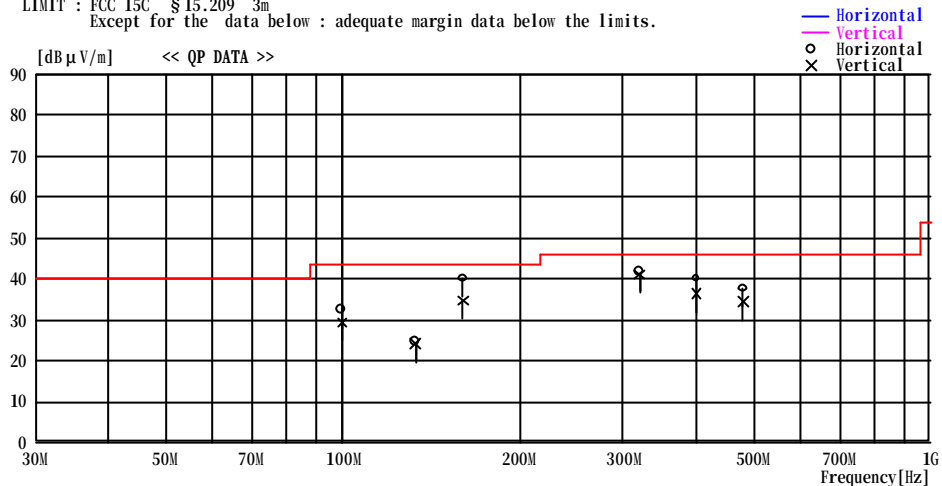
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/06/13 14:04:30

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 27 deg.C. / 44 %
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch 161(5805MHz) HOR:X-Axis,VER:Z-Axis(MAX)

LIMIT : FCC 15C §15.209 3m
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dB μV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μV/m]	LIMIT [dB μV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	99.705	38.3	10.1	7.2	23.0	32.6	43.5	10.9	322	70
2	132.949	26.6	13.7	7.4	23.0	24.7	43.5	18.8	169	264
3	160.000	40.3	15.2	7.6	23.0	40.1	43.5	3.5	118	254
4	320.000	41.3	14.9	8.4	22.9	41.7	46.0	4.3	100	92
5	400.000	35.7	18.3	8.9	22.8	40.1	46.0	5.9	100	256
6	479.997	33.1	18.3	9.2	22.9	37.7	46.0	8.3	210	123
----- Vertical -----										
7	99.700	35.1	10.1	7.2	23.0	29.4	43.5	14.1	100	82
8	132.935	26.1	13.7	7.4	23.0	24.2	43.5	19.3	100	0
9	160.011	34.9	15.2	7.6	23.0	34.7	43.5	8.8	100	260
10	320.003	40.6	14.9	8.4	22.9	41.0	46.0	5.0	143	310
11	400.004	31.9	18.3	8.9	22.8	36.3	46.0	9.7	100	287
12	480.003	29.7	18.3	9.2	22.9	34.3	46.0	11.7	100	82

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

Radiated Spurious Emission (above 1GHz:Inside of the restricted band)
***Detector:PK**

DATA OF RADIATED EMISSION TEST

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

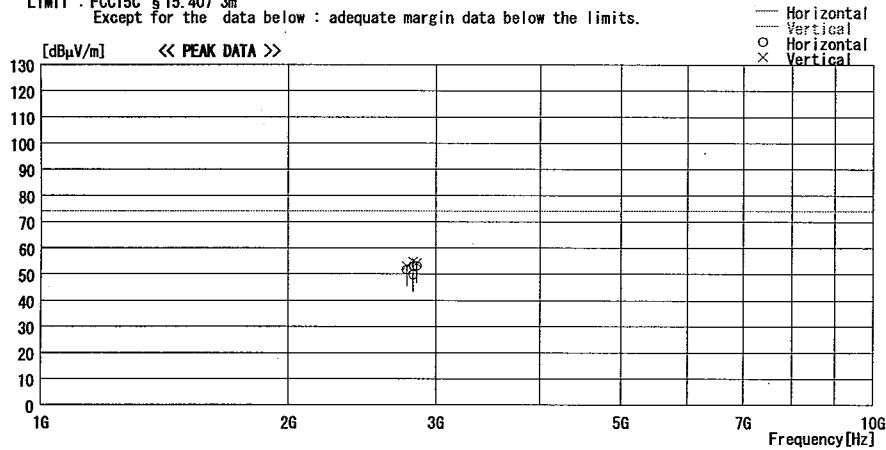
Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 25 deg. C. / 60 % 2004/06/20
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a,
54Mbps, HOR/VER:Z-Axis(MAX)

LIMIT : FCC15C §15.407 3m

Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Polar.	Limit	Margin
[MHz]	[dBμV]		[dB/m]	[dB]	[dBμV/m]		[dBμV/m]	[dB]
2770.000	50.8	PK	31.8	-29.5	53.1	Vert.	74.0	20.9
2770.000	49.5	PK	31.8	-29.5	51.8	Hori.	74.0	22.2
2817.000	47.2	PK	31.9	-29.3	49.8	Hori.	74.0	24.2
2817.000	52.2	PK	31.9	-29.3	54.8	Vert.	74.0	19.2
2847.000	50.4	PK	32.0	-29.3	53.1	Hori.	74.0	20.9
2847.000	51.5	PK	32.0	-29.3	54.2	Vert.	74.0	19.8

Tx:Ch36
Tx:Ch36
Tx:Ch52
Tx:Ch52
Tx:Ch64
Tx:Ch64

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

DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

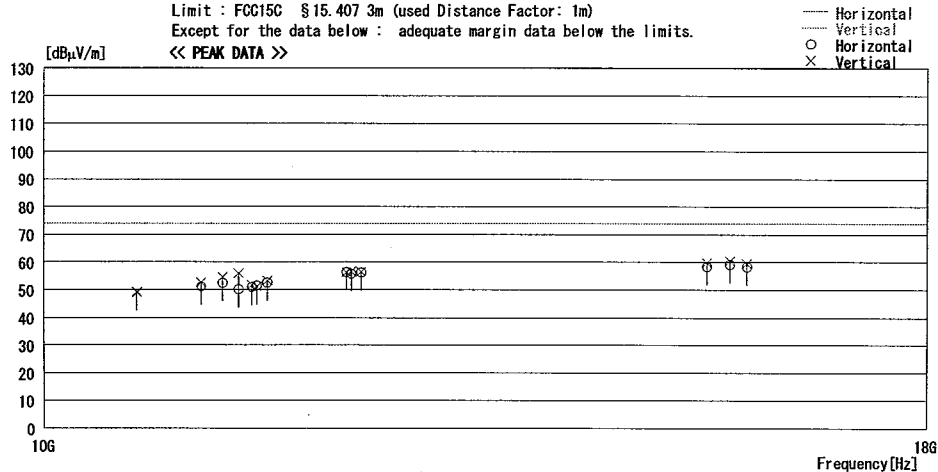
Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a

54Mbps, HOR/VER:Z-Axis(MAX)

Limit : FCC15C §15.407 3m (used Distance Factor: 1m)

Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level
[MHz]	[dBμV]		[dB/m]	[dB]	[dBμV/m]
10640.000	31.8	PK	37.9	-20.5	49.2
10640.000	31.6	PK	37.9	-20.5	49.0
11108.000	34.4	PK	38.7	-20.5	52.6
11108.000	32.9	PK	38.7	-20.5	51.1
11268.000	33.7	PK	39.1	-20.4	52.4
11268.000	36.0	PK	39.1	-20.4	54.7
11388.000	31.2	PK	39.4	-20.4	50.2
11388.000	36.9	PK	39.4	-20.4	55.9
11490.000	31.7	PK	39.7	-19.7	51.7
11490.000	31.0	PK	39.7	-19.7	51.0
11530.000	31.1	PK	39.8	-19.7	51.2
11530.000	31.4	PK	39.8	-19.7	51.5
11610.000	32.4	PK	40.0	-19.8	52.6
11610.000	33.1	PK	40.0	-19.8	53.3
12238.000	34.8	PK	41.5	-20.0	56.3
12238.000	34.8	PK	41.5	-20.0	56.3
12278.000	34.9	PK	41.6	-20.0	56.5
12278.000	34.2	PK	41.6	-20.0	55.8
12358.000	34.2	PK	41.8	-19.8	56.2
12358.000	34.4	PK	41.8	-19.8	56.4

Polar.	Limit	Margin	
	[dBμV/m]	[dB]	
Vert.	74.0	24.8	Tx:Ch64
Vert.	74.0	25.0	Tx:Ch64
Vert.	74.0	21.4	Tx:Ch36
Hori.	74.0	22.9	Tx:Ch36
Hori.	74.0	21.6	Tx:Ch52
Vert.	74.0	19.3	Tx:Ch52
Hori.	74.0	23.8	Tx:Ch64
Vert.	74.0	18.1	Tx:Ch64
Vert.	74.0	22.3	Tx:Ch149
Hori.	74.0	23.0	Tx:Ch149
Vert.	74.0	22.8	Tx:Ch153
Hori.	74.0	22.5	Tx:Ch153
Hori.	74.0	21.4	Tx:Ch161
Vert.	74.0	20.7	Tx:Ch161
Vert.	74.0	17.7	Tx:Ch149
Hori.	74.0	17.7	Tx:Ch149
Vert.	74.0	17.5	Tx:Ch153
Hori.	74.0	18.2	Tx:Ch153
Hori.	74.0	17.8	Tx:Ch161
Vert.	74.0	17.6	Tx:Ch161

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

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 : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IIRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a
54Mbps, HOR/VER:Z-Axis(MAX)
Limit : FCC15C §15.407 3m (used Distance Factor : 1m)
Except for the data below : adequate margin data below the limits.

Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Polar.	Limit	Margin	
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
15540.000	33.2	PK	42.7	-17.4	58.5	Hori.	74.0	15.5	Tx:Ch36
15540.000	34.6	PK	42.7	-17.4	59.9	Vert.	74.0	14.1	Tx:Ch36
15780.000	33.9	PK	43.0	-17.6	59.3	Hori.	74.0	14.7	Tx:Ch52
15780.000	35.1	PK	43.0	-17.6	60.5	Vert.	74.0	13.5	Tx:Ch52
15960.000	32.6	PK	43.3	-17.6	58.3	Hori.	74.0	15.7	Tx:Ch64
15960.000	33.8	PK	43.3	-17.6	59.5	Vert.	74.0	14.5	Tx:Ch64

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

UL Apex Co., Ltd.

Head Office EMC Lab.

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MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

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

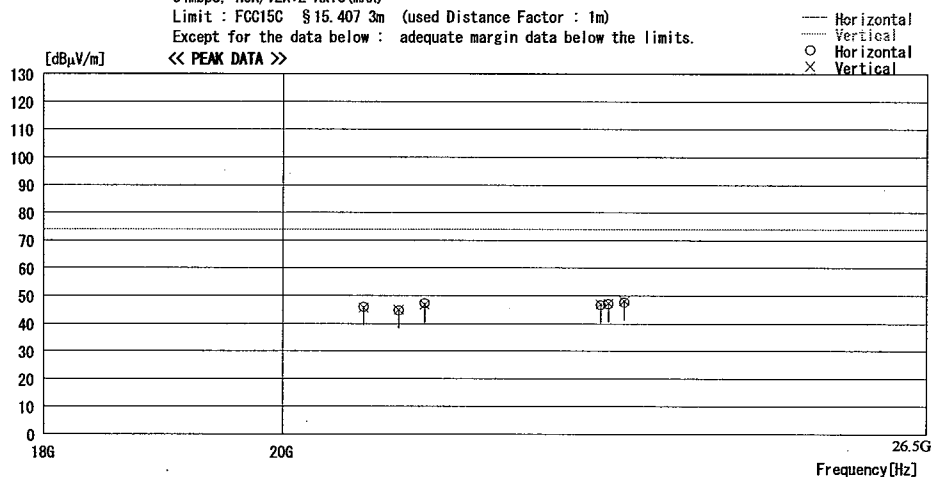
Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C / 60 % 2004/06/20
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a
54Mbps, HOR/VER:Z-Axis(MAX)

Limit : FCC15C §15.407 3m (used Distance Factor : 1m)

Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level
[MHz]	[dBμV]		[dB/m]	[dB]	[dBμV/m]
20720.000	34.1	PK	40.2	-28.6	45.7
20720.000	34.4	PK	40.2	-28.6	46.0
21040.000	32.7	PK	40.3	-28.3	44.7
21040.000	32.8	PK	40.3	-28.3	44.8
21280.000	34.2	PK	40.6	-28.1	46.7
21280.000	34.8	PK	40.6	-28.1	47.3
22980.000	34.0	PK	40.8	-28.0	46.8
22980.000	34.2	PK	40.8	-28.0	47.0
23060.000	34.7	PK	40.7	-28.0	47.4
23060.000	34.4	PK	40.7	-28.0	47.1
23220.000	35.2	PK	40.4	-27.9	47.7
23220.000	35.6	PK	40.4	-27.9	48.1

Polar.	Limit	Margin
	[dBμV/m]	[dB]
Vert.	74.0	28.3
Hori.	74.0	28.0
Hori.	74.0	29.3
Vert.	74.0	29.2
Vert.	74.0	27.3
Hori.	74.0	26.7
Hori.	74.0	27.2
Vert.	74.0	27.0
Vert.	74.0	26.6
Hori.	74.0	26.9
Hori.	74.0	26.3
Vert.	74.0	25.9

Tx:Ch36
Tx:Ch36
Tx:Ch52
Tx:Ch52
Tx:Ch64
Tx:Ch64
Tx:Ch149
Tx:Ch149
Tx:Ch153
Tx:Ch153
Tx:Ch161
Tx:Ch161

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

UL Apex Co., Ltd.

Head Office EMC Lab.

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MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

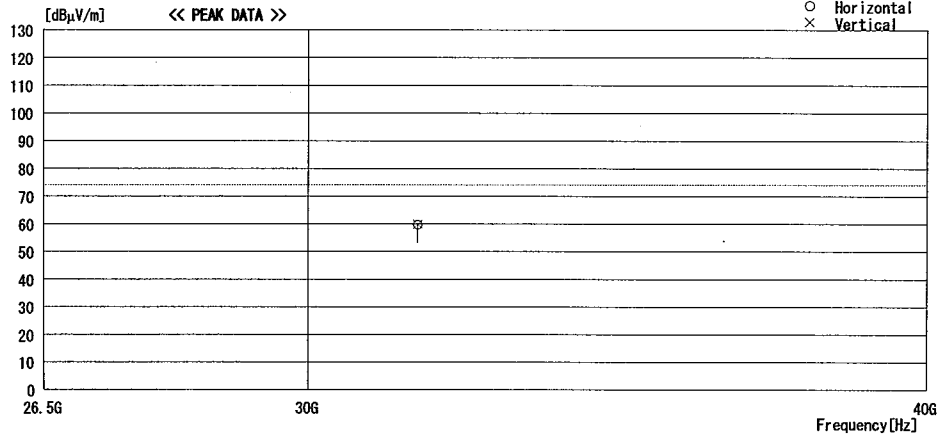
Report No. : 24HE0082-HO
Power : DC 3.3V / distance 0.5m
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a
54Mbps, HOR/VER:Z-Axis(MAX)

Limit : FCC15C §15.407 3m (used Distance Factor : 0.5m)

Except for the data below : adequate margin data below the limits.

— Horizontal
— Vertical
○ Horizontal
× Vertical



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level
[MHz]	[dBμV]		[dB/m]	[dB]	[dBμV/m]
31560.000	31.4	PK	43.3	-15.0	59.7
31560.000	31.5	PK	43.3	-15.0	59.8

Polar.	Limit	Margin
	[dBμV/m]	[dB]
Hori.	74.0	14.3
Vert.	74.0	14.2

Tx:Ch52
Tx:Ch52

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

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MF060b(10.04.03)

Radiated Spurious Emission (above 1GHz:Inside of the restricted band)
***Detector:AV**

DATA OF RADIATED EMISSION TEST

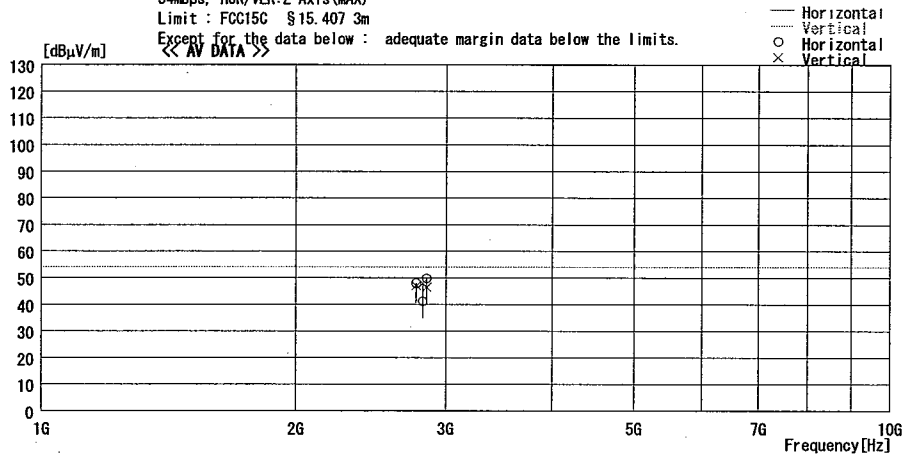
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a
54Mbps, HOR/VER:Z-Axis(MAX)
Limit : FCC15C §15.407 3m

Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBμV]	DET	Antenna	Loss&	Level [dBμV/m]
			Factor [dB/m]	Gain [dB]	
2770.000	44.7	AV	31.8	-29.5	47.0
2770.000	45.7	AV	31.8	-29.5	48.0
2817.000	38.6	AV	31.9	-29.3	41.2
2817.000	45.3	AV	31.9	-29.3	47.9
2847.000	47.1	AV	32.0	-29.3	49.8
2847.000	43.7	AV	32.0	-29.3	46.4

Polar.	Limit [dBμV/m]	Margin [dB]
Vert.	54.0	7.0
Hori.	54.0	6.0
Hori.	54.0	12.8
Vert.	54.0	6.1
Hori.	54.0	4.2
Vert.	54.0	7.6

Tx:Ch36
Tx:Ch36
Tx:Ch52
Tx:Ch52
Tx:Ch64
Tx:Ch64

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

DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

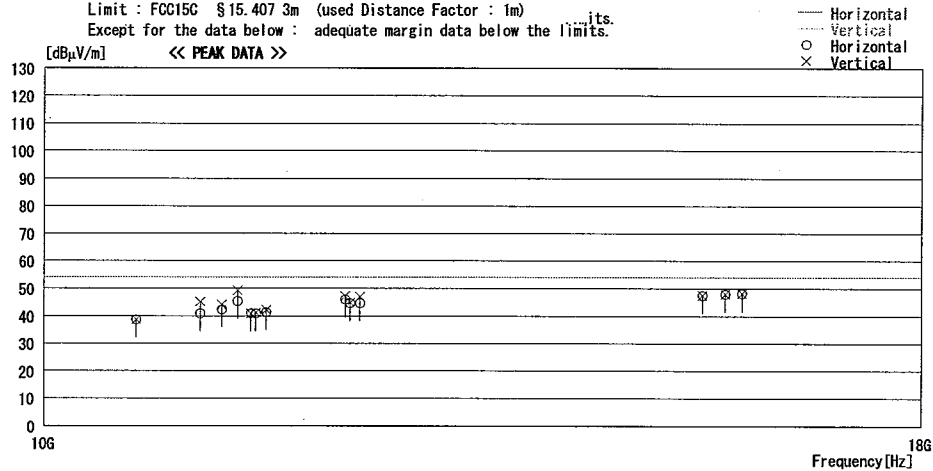
Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Umeyama

Mode / Transmitting IEEE802.11a 102.11a.

54Mbps, HOR/VER:Z-Axis(MAX)

Limit : FCC15C §15.407 3m (used Distance Factor : 1m)

Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss & Gain
[MHz]	[dBμV]		[dB/m]	[dB]
10640.000	21.2	AV	37.9	-20.5
10640.000	21.2	AV	37.9	-20.5
11108.000	27.0	AV	38.7	-20.5
11108.000	22.7	AV	38.7	-20.5
11268.000	23.6	AV	39.1	-20.4
11268.000	25.4	AV	39.1	-20.4
11388.000	26.4	AV	39.4	-20.4
11388.000	30.3	AV	39.4	-20.4
11490.000	20.9	AV	39.7	-19.7
11490.000	21.0	AV	39.7	-19.7
11530.000	21.1	AV	39.8	-19.7
11530.000	20.8	AV	39.8	-19.7
11610.000	22.0	AV	40.0	-19.8
11610.000	21.1	AV	40.0	-19.8
12238.000	25.7	AV	41.5	-20.0
12238.000	24.5	AV	41.5	-20.0
12278.000	23.3	AV	41.6	-20.0
12278.000	23.1	AV	41.6	-20.0
12358.000	22.7	AV	41.8	-19.8
12358.000	25.0	AV	41.8	-19.8

Height	Polar.	Limit	Margin	
[cm]		[dBμV/m]	[dB]	
100	Vert.	54.0	15.4	Tx:Ch64
100	Hori.	54.0	15.4	Tx:Ch64
100	Vert.	54.0	8.8	Tx:Ch36
100	Hori.	54.0	13.1	Tx:Ch36
100	Hori.	54.0	11.7	Tx:Ch52
100	Vert.	54.0	9.9	Tx:Ch52
100	Hori.	54.0	8.6	Tx:Ch64
100	Vert.	54.0	4.7	Tx:Ch64
100	Vert.	54.0	13.1	Tx:Ch149
100	Hori.	54.0	13.0	Tx:Ch149
100	Vert.	54.0	12.8	Tx:Ch153
100	Hori.	54.0	13.1	Tx:Ch153
100	Vert.	54.0	11.8	Tx:Ch161
100	Hori.	54.0	12.7	Tx:Ch161
100	Vert.	54.0	6.8	Tx:Ch149
100	Hori.	54.0	8.0	Tx:Ch149
100	Vert.	54.0	9.1	Tx:Ch153
100	Hori.	54.0	9.3	Tx:Ch153
100	Hori.	54.0	9.3	Tx:Ch161
100	Vert.	54.0	7.0	Tx:Ch161

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

UL Apex Co., Ltd.

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MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IIRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a
54Mbps, HOR/VER:Z-Axis (MAX)
Limit : FCC15C §15.407 3m (used Distance Factor : 1m)
Except for the data below : adequate margin data below the limits.

Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss &	Level [dBuV/m]
			Factor [dB/m]	Gain [dB]	
15540.000	22.2	AV	42.7	-17.4	47.5
15540.000	22.2	AV	42.7	-17.4	47.5
15780.000	22.6	AV	43.0	-17.6	48.0
15780.000	22.6	AV	43.0	-17.6	48.0
15960.000	22.5	AV	43.3	-17.6	48.2
15960.000	22.5	AV	43.3	-17.6	48.2

Polar.	Limit	Margin	
	[dBuV/m]	[dB]	
Hori.	54.0	6.5	Tx:Ch36
Vert.	54.0	6.5	Tx:Ch36
Hori.	54.0	6.0	Tx:Ch52
Vert.	54.0	6.0	Tx:Ch52
Hori.	54.0	5.8	Tx:Ch64
Vert.	54.0	5.8	Tx:Ch64

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

Test report No. : 24HE0082-HO-3A
Page : 42 of 64
Issued date : June 30, 2004
FCC ID : AK8IRF302U

DATA OF RADIATED EMISSION TEST

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

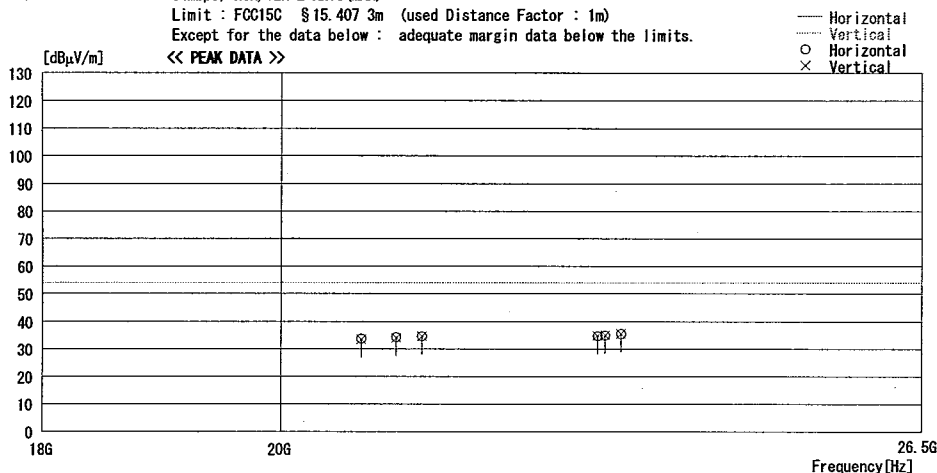
Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a
54Mbps, HOR/VER:Z-Axis(MAX)

Limit : FCC15C §15.407 3m (used Distance Factor : 1m)

Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level
[MHz]	[dBμV]		[dB/m]	[dB]	[dBμV/m]
20720.000	21.8	AV	40.2	-28.6	33.4
20720.000	22.0	AV	40.2	-28.6	33.6
21040.000	22.2	AV	40.3	-28.3	34.2
21040.000	21.9	AV	40.3	-28.3	33.9
21280.000	22.0	AV	40.6	-28.1	34.5
21280.000	22.0	AV	40.6	-28.1	34.5
22980.000	21.9	AV	40.8	-28.0	34.7
22980.000	22.0	AV	40.8	-28.0	34.8
23060.000	22.2	AV	40.7	-28.0	34.9
23060.000	22.2	AV	40.7	-28.0	34.9
23220.000	23.0	AV	40.4	-27.9	35.5
23220.000	23.0	AV	40.4	-27.9	35.5

Polar.	Limit	Margin	
	[dBμV/m]	[dB]	
Vert.	54.0	20.6	Tx:Ch36
Hori.	54.0	20.4	Tx:Ch36
Hori.	54.0	19.8	Tx:Ch52
Vert.	54.0	20.1	Tx:Ch52
Vert.	54.0	19.5	Tx:Ch64
Hori.	54.0	19.5	Tx:Ch64
Hori.	54.0	19.3	Tx:Ch149
Vert.	54.0	19.2	Tx:Ch149
Vert.	54.0	19.1	Tx:Ch153
Hori.	54.0	19.1	Tx:Ch153
Hori.	54.0	18.5	Tx:Ch161
Vert.	54.0	18.5	Tx:Ch161

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

UL Apex Co., Ltd.

Head Office EMC Lab.

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MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

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

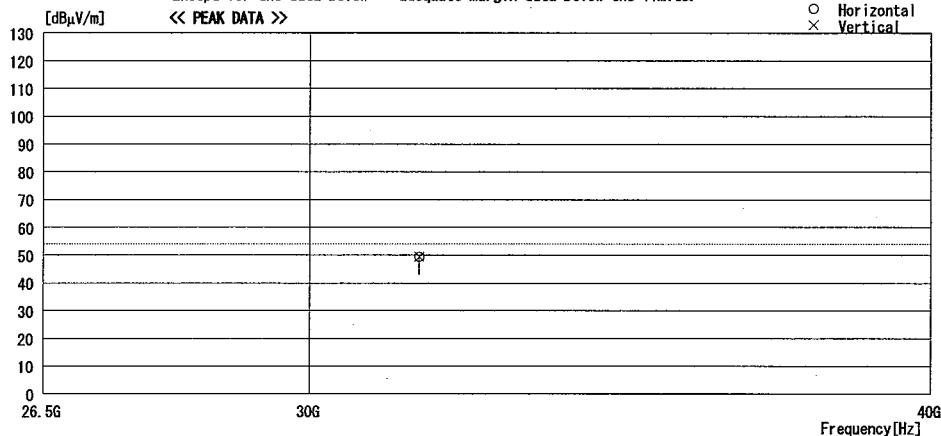
Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125

Report No. : 24HE0082-HO
Power : DC 3.3V / distance 0.5m
Temp./Humi. : 25 deg.C. / 60 % 2004/06/20
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a
54Mbps, HOR/VER:Z-Axis (MAX)

Limit : FCC15C §15.407 3m (used Distance Factor : 0.5m)

Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna	Loss & Gain	Level
[MHz]	[dBμV]		Factor	[dB]	[dBμV/m]
31560.000	21.1	AV	43.3	-15.0	49.4
31560.000	21.2	AV	43.3	-15.0	49.5

Polar.	Limit	Margin
	[dBμV/m]	[dB]
Hori.	54.0	4.6
Vert.	54.0	4.5

Tx:Ch52
Tx:Ch52

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

UL Apex Co., Ltd.

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MF060b(10.04.03)

Radiated Spurious Emission (above 1GHz:Outside of the restricted band)
***used substitution**

COMPANY	Sony Corporation	REPORT NO	24HE0082-HO
EQUIPMENT	Wireless LAN Module	REGULATION	FCC15.407
MODEL	IRF302U	TEST DISTANCE	3m
S/N	125	DATE	20/06/2004
POWER	DC3.3V	TEMPERATURE	25°C
MODE	Tx 5180/5260/5320/5745/5765/5805	HUMIDITY	60%
POSITION	H: Z-axis / V: Z-axis	CALIBRATION	OK
TX ANTENNA HIGH	0.8m	ENGINEER	Hiroka Umeyama

No.	FREQUENCY [MHz]	(After Factor Calculation) [dBuV/m]		RESULT (EIRP) [dBm] (dBm)		LIMIT [dBm]	MARGIN [dB]		Mode
		HOR	VER	HOR	VER		HOR	VER	
1	3059.50	54.0	57.2	-47.5	-44.5	-27.0	20.5	17.5	Operating
2	3069.50	54.3	57.2	-47.2	-44.5	-27.0	20.2	17.5	Operating
3	3089.50	54.0	58.5	-47.5	-43.2	-27.0	20.5	16.2	Operating
4	5554.00	55.8	58.3	-47.1	-44.5	-27.0	20.1	17.5	Operating
5	5634.00	55.2	56.5	-47.6	-46.1	-27.0	20.6	19.1	Operating
6	5694.00	54.0	56.1	-48.7	-46.4	-27.0	21.7	19.4	Operating
7	6119.00	58.0	56.6	-44.1	-45.1	-27.0	17.1	18.1	Operating
8	6139.00	55.2	55.8	-46.9	-45.9	-27.0	19.9	18.9	Operating
9	6179.00	54.6	56.7	-47.4	-44.9	-27.0	20.4	17.9	Operating

Tx:Ch149
Tx:Ch153
Tx:Ch161
Tx:Ch36
Tx:Ch52
Tx:Ch64
Tx:Ch149
Tx:Ch153
Tx:Ch161

Rx-ANTENNA : Biconical Antena(25-300MHz), Logperriodic Antenna(300-1000MHz), Horn Antenna(1-12.75GHz)
Tx-ANTENNA : Dipole Antenna(25-1000MHz), Horn Antenna(1-12.75GHz)

With the result above, the effective radiated power was calculated on the basis of the reference value
- for the calibration data on the substitution measurement.
Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

Radiated Spurious Emission (above 1GHz:Outside of the restricted band)

* used conversion formula

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

COMPANY	Sony Corporation	REPORT NO	24HE0082-HO
EQUIPMENT	Wireless LAN Module	REGULATION	FCC15.407
MODEL	IRF302U	TEST DISTANCE	1 / 0.5 m
S/N	125	DATE	20/06/2004
POWER	DC3.3V	TEMPERATURE	25 °C
MODE	Tx 5180/5320/5745/5805	HUMIDITY	60%
POSITION	H: Z-axis / V: Z-axis	CALIBRATION	OK
TX ANTENNA HIGH	0.8m	ENGINEER	Hiroka Umeyama

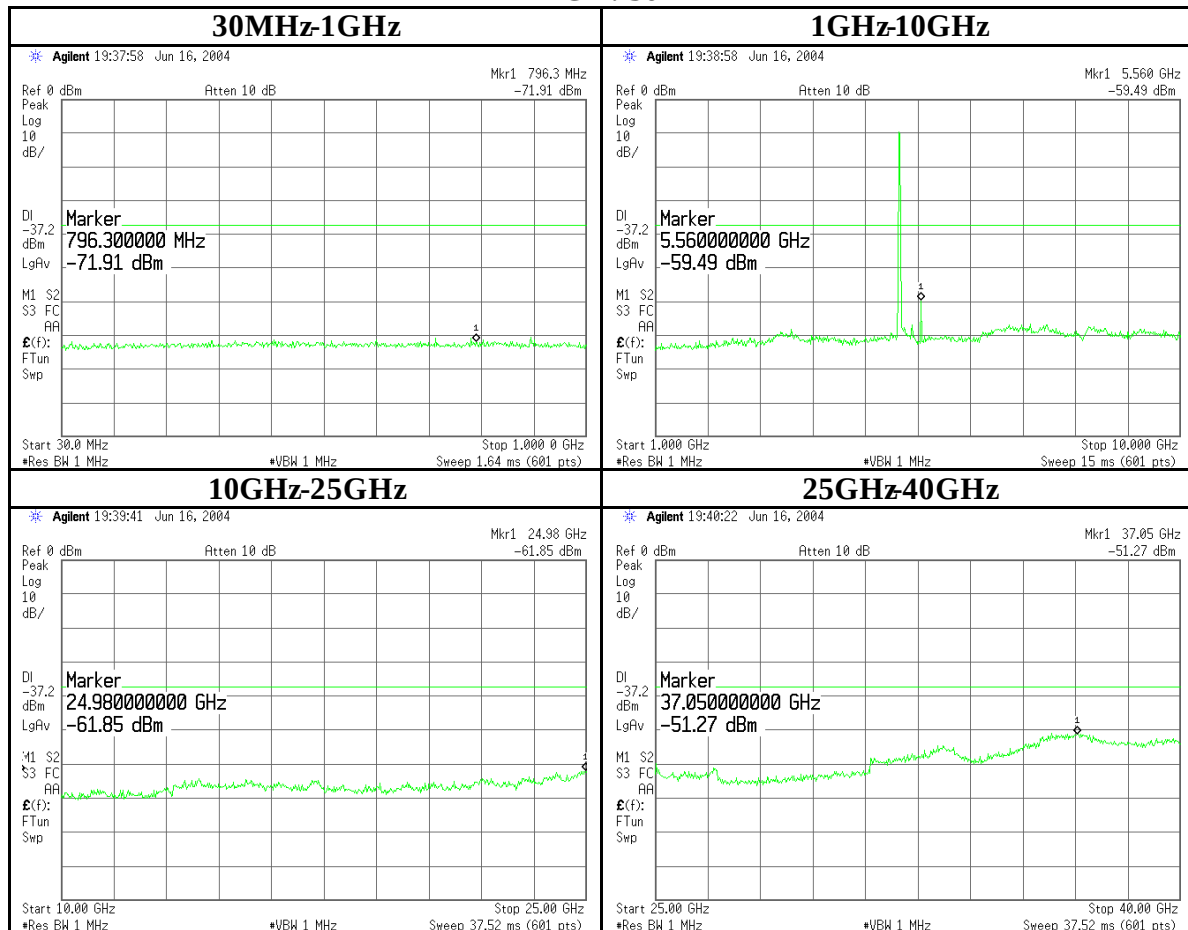
No.	FREQUENCY [MHz]	(After Factor Calculation) [dBuV/m]		RESULT (EIRP) [dBm] (dBm)		LIMIT [dBm]	MARGIN [dB]		Mode
		HOR	VER	HOR	VER		HOR	VER	
1	10360.00	50.5	47.3	-44.7	-47.9	-27.0	17.7	20.9	Operating Tx:Ch36
2	10520.00	49.6	49.9	-45.6	-45.3	-27.0	18.6	18.3	Operating Tx:Ch52
3	17235.00	63.0	63.7	-32.2	-31.5	-27.0	5.2	4.5	Operating Tx:Ch149
4	17295.00	63.5	62.4	-31.7	-32.8	-27.0	4.7	5.8	Operating Tx:Ch153
5	17415.00	63.7	65.0	-31.5	-30.2	-27.0	4.5	3.2	Operating Tx:Ch161
6	25900.00	49.5	47.5	-45.7	-47.7	-27.0	18.7	20.7	Operating Tx:Ch36
7	26300.00	49.3	49.1	-45.9	-46.1	-27.0	18.9	19.1	Operating Tx:Ch52
8	26600.00	54.9	55.3	-40.3	-39.9	-27.0	13.3	12.9	Operating Tx:Ch64
9	28725.00	51.5	51.7	-43.7	-43.5	-27.0	16.7	16.5	Operating Tx:Ch149
10	28825.00	52.9	52.7	-42.3	-42.5	-27.0	15.3	15.5	Operating Tx:Ch153
11	29025.00	53.4	52.9	-41.8	-42.3	-27.0	14.8	15.3	Operating Tx:Ch161
12	31080.00	59.3	59.4	-35.9	-35.8	-27.0	8.9	8.8	Operating Tx:Ch36
13	31920.00	60.8	60.1	-34.4	-35.1	-27.0	7.4	8.1	Operating Tx:Ch64
14	34470.00	57.7	57.2	-37.5	-38.0	-27.0	10.5	11.0	Operating Tx:Ch149
15	34590.00	58.3	57.6	-36.9	-37.6	-27.0	9.9	10.6	Operating Tx:Ch153
16	34830.00	57.1	57.8	-38.1	-37.4	-27.0	11.1	10.4	Operating Tx:Ch161
17	36260.00	67.0	67.0	-28.2	-28.2	-27.0	1.2	1.2	Operating Tx:Ch36
18	36820.00	63.9	64.0	-31.3	-31.2	-27.0	4.3	4.2	Operating Tx:Ch52
19	37240.00	67.0	67.0	-28.2	-28.2	-27.0	1.2	1.2	Operating Tx:Ch64

Rx-ANTENNA : Horn Antenna
Result(EIRP[dBm])=10*LOG({ (Electric Field Strength [V/m] * Distance:3[m]) ^ 2 } / 30)

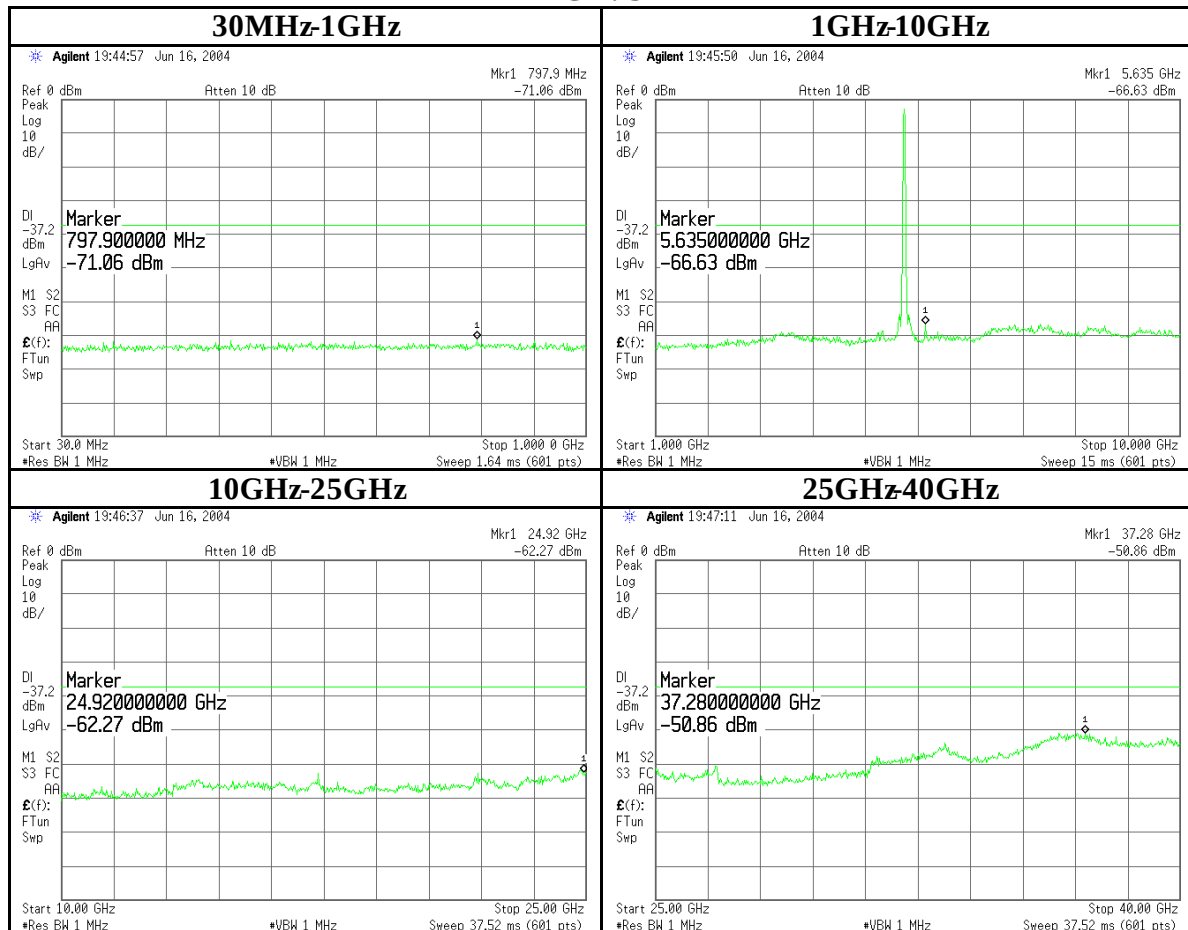
Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

Conducted Spurious Emission(DSSS and other forms of modulation)

Ch : 36

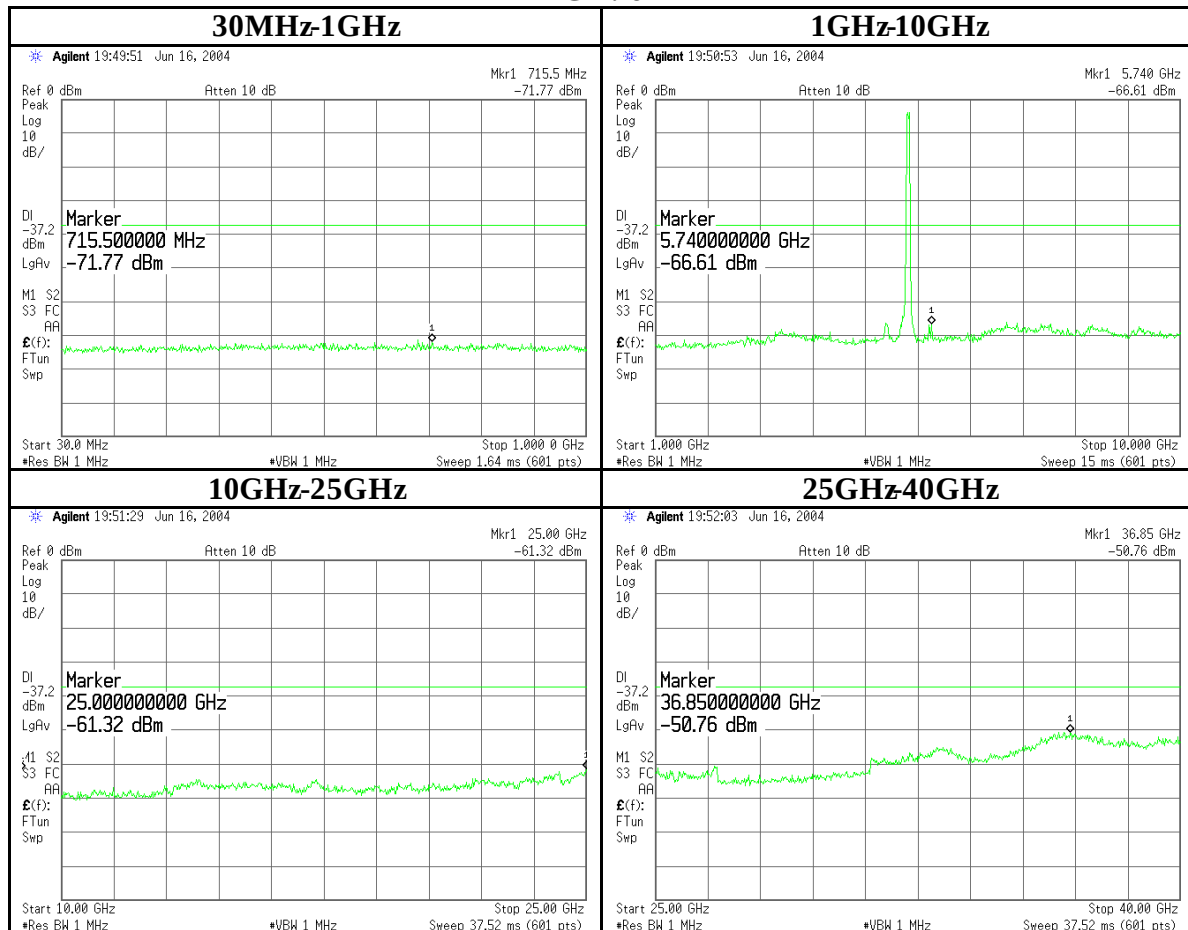


Conducted Spurious Emission(DSSS and other forms of modulation)
Ch : 52



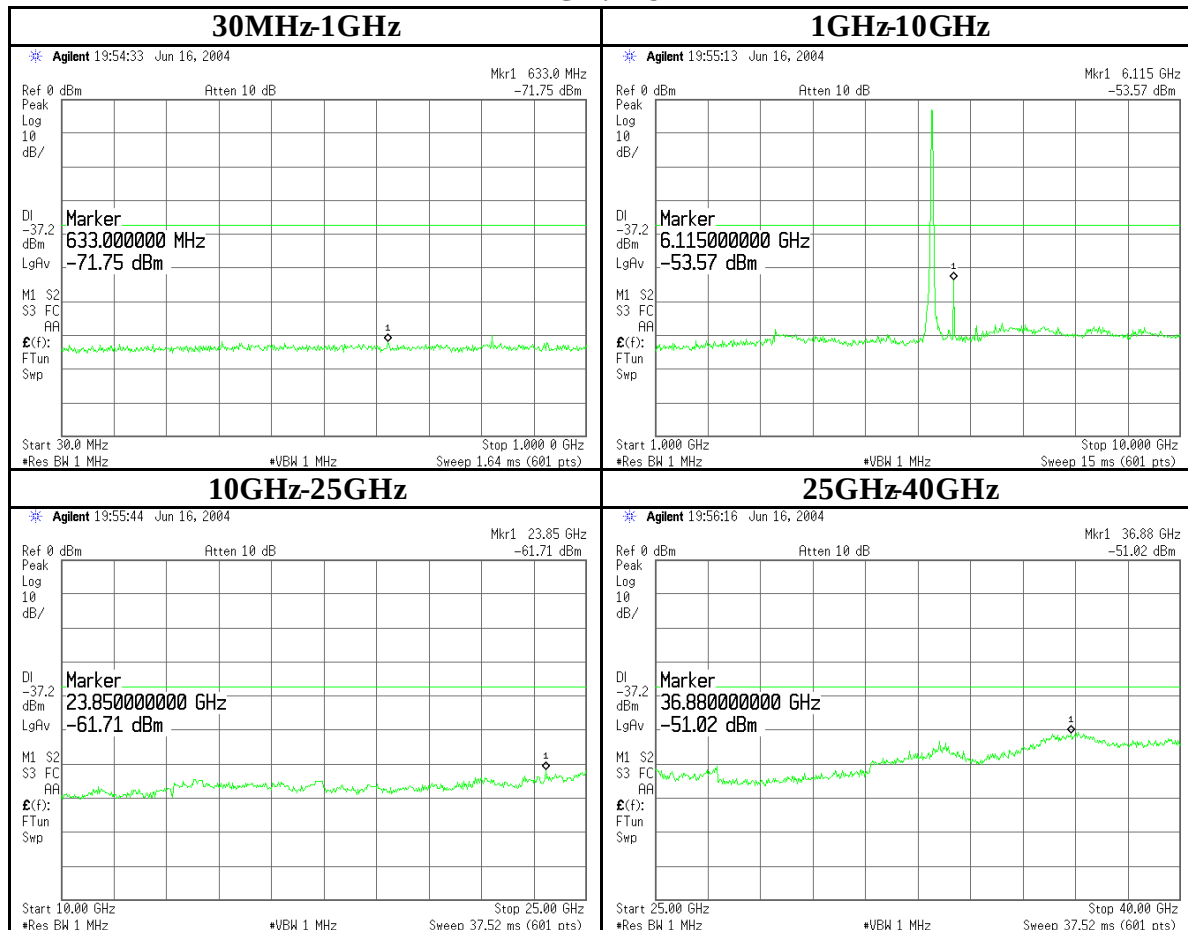
Conducted Spurious Emission(DSSS and other forms of modulation)

Ch : 64



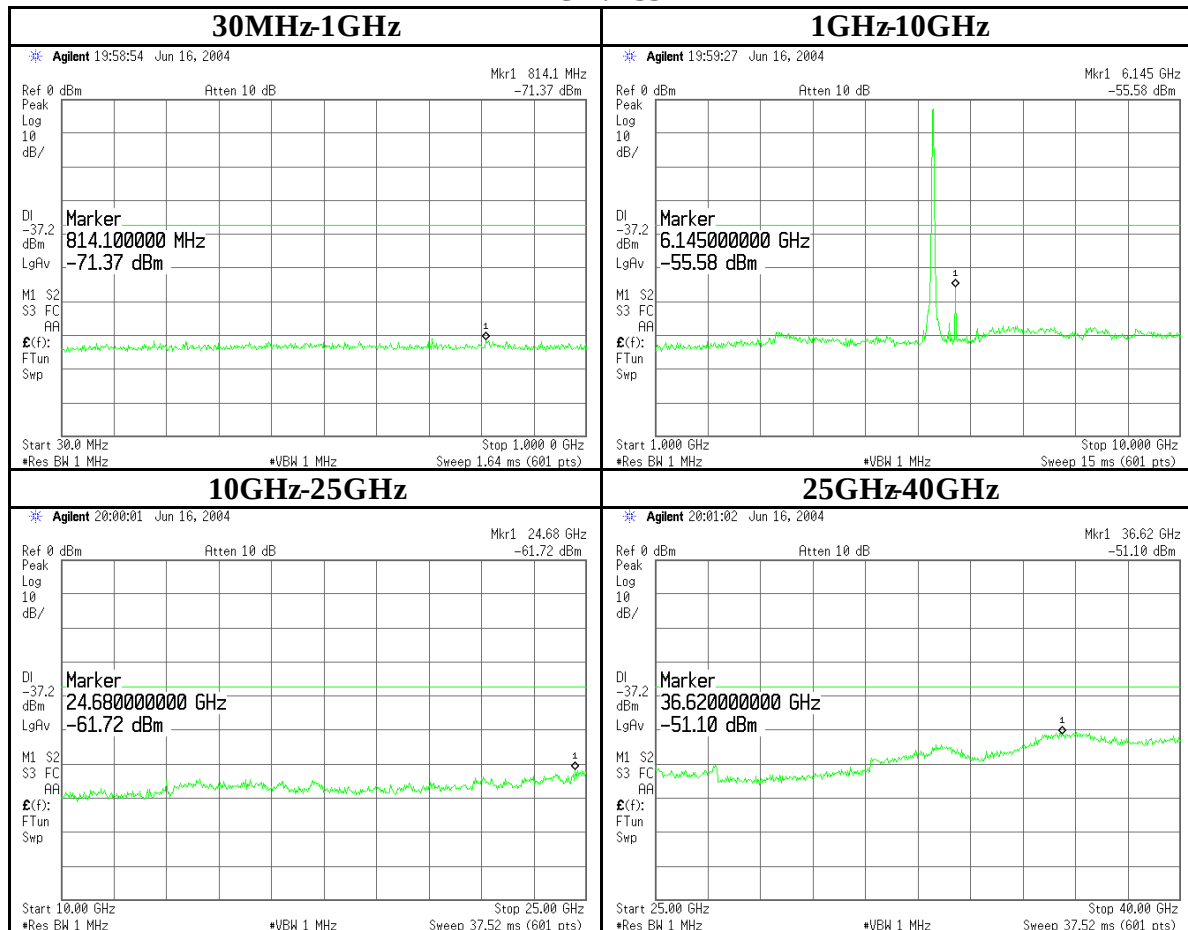
Conducted Spurious Emission(DSSS and other forms of modulation)

Ch : 149



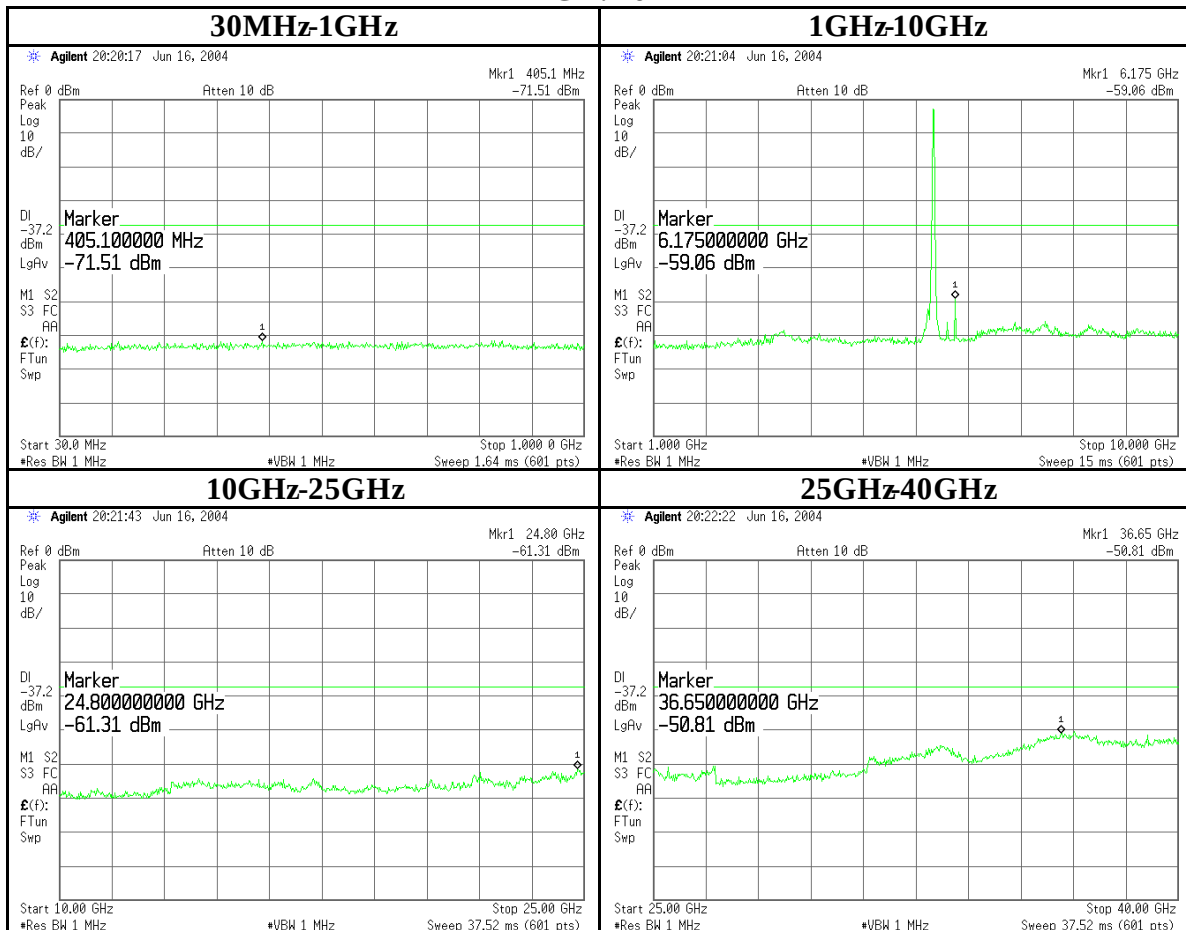
Conducted Spurious Emission(DSSS and other forms of modulation)

Ch : 153



Conducted Spurious Emission(DSSS and other forms of modulation)

Ch : 161



Radiated emission Band Edge compliance

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

COMPANY	Sony Corporation	REPORT NO	24HE0082-HO
EQUIPMENT	Wireless LAN Module	REGULATION	FCC15.407
MODEL	IRF302U	TEST DISTANCE	3m
S/N	125	DATE	13/06/2004
POWER	DC3.3V	TEMPERATURE	25°C
MODE	Tx 5180/5320/5745/5805	HUMIDITY	60%
POSITION	H: Z-axis / V: Z-axis	CALIBRATION	OK
TX ANTENNA HIGH	0.8m	ENGINEER	Hiroka Umeyama

No.	FREQUENCY [MHz]	(After Factor Calculation) [dBuV/m]		RESULT (EIRP) [dBm] (dBm)		LIMIT [dBm] (EIRP)	MARGIN [dB]		Mode
		HOR	VER	HOR	VER		HOR	VER	
3	5715.00	71.7	71.9	-31.0	-30.6	-27.0	4.0	3.6	Operating
4	5725.00	83.1	82.3	-19.5	-20.2	-17.0	2.5	3.2	Operating
5	5825.00	78.5	75.5	-24.0	-26.8	-17.0	7.0	9.8	Operating
6	5835.00	66.2	63.3	-36.3	-39.0	-27.0	9.3	12.0	Operating

Tx:Ch149
Tx:Ch149
Tx:Ch161
Tx:Ch161

Rx-ANTENNA : Biconical Antenna(25-300MHz), Logperiodic Antenna(300-1000MHz), Horn Antenna(1-12.75GHz)
Tx-ANTENNA : Dipole Antenna(25-1000MHz), Horn Antenna(1-12.75GHz)

With the result above, the effective radiated power was calculated on the basis of the reference value
- for the calibration data on the substitution measurement.
Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

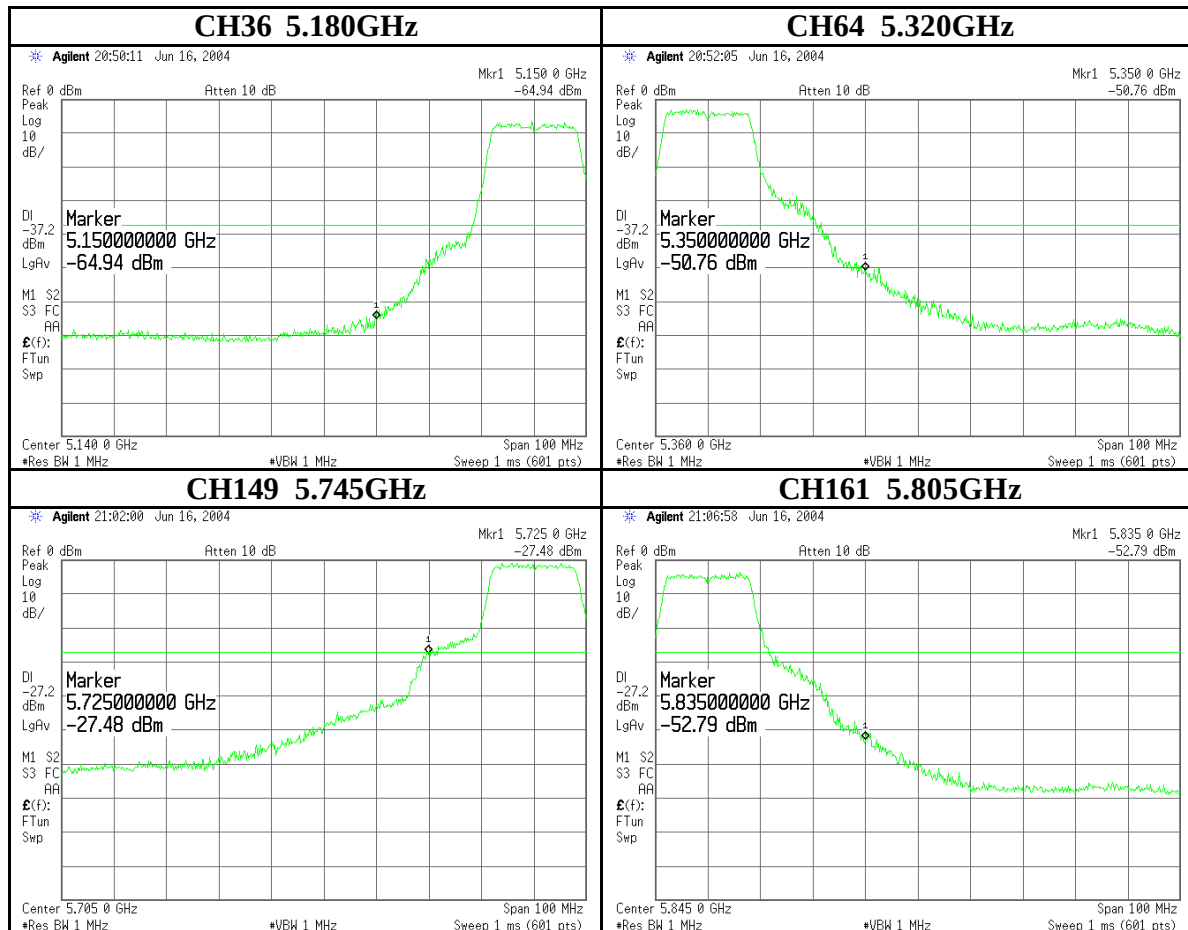
PK DETECT												
(RBW: 1MHz, VBW: 1MHz)												
No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBmV/m]	[dBmV/m]					[dBmV/m]	[dBmV/m]		[dB]	[dB]
Test distance 3meters. RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	5150.0	42.8	40.2	36.3	35.9	9.9	0.0	53.1	50.5	74.0	20.9	23.5
2	5350.0	55.7	56.4	36.2	35.8	10.0	0.0	66.1	66.8	74.0	7.9	7.2

Tx:Ch36
Tx:Ch64

AV DETECT (RBW: 1MHz, VBW: 10Hz)												
No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
Test distance 3meters. RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	5150.0	31.2	31.1	36.3	35.9	9.9	0.0	41.5	41.4	54.0	12.5	12.6
2	5350.0	38.5	37.9	36.2	35.8	10.0	0.0	48.9	48.3	54.0	5.1	5.7

Tx:Ch36
Tx:Ch64

Conducted emission Band Edge compliance



Peak Power Spectral Density

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

Company : Sony Corporation
Equipment : Wireless LAN Module
Model : IRF302U
Sample No. : 11
Power : DC3.3V
Mode : Tx IEEE 802.11a 54Mbps

REPORT NO : 24HE0082-HO
REGULATION : FCC 15.407(a)(1)(2)(3)
TEST DISTANCE : -
DATE : 06/16/2004
TEMPERATURE : 24deg.C
HUMIDITY : 39%
ENGINEER : Hiroka Umeyama

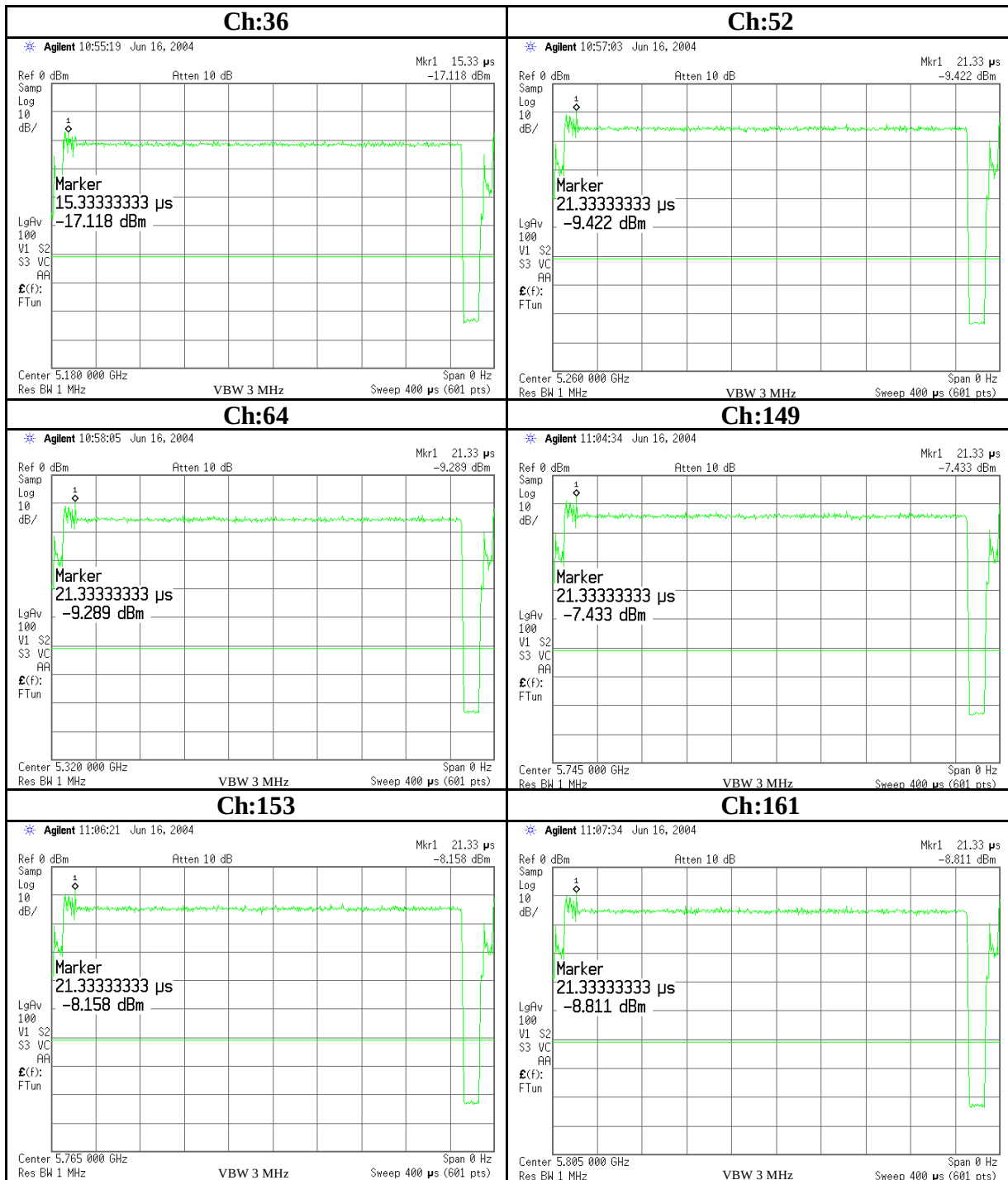
Ch	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
36	5180.0	-17.12	2.1	10.0	-5.0	4.0	9.0
52	5260.0	-9.42	2.1	10.0	2.7	11.0	8.3
64	5320.0	-9.29	2.1	10.0	2.8	11.0	8.2
149	5745.0	-7.43	2.1	10.0	4.7	17.0	12.3
153	5765.0	-8.16	2.1	10.0	3.9	17.0	13.1
161	5805.0	-8.81	2.1	10.0	3.3	17.0	13.7

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

* Atten. was not used for factor 0.0dB of the above table.

Peak Power Spectral Density



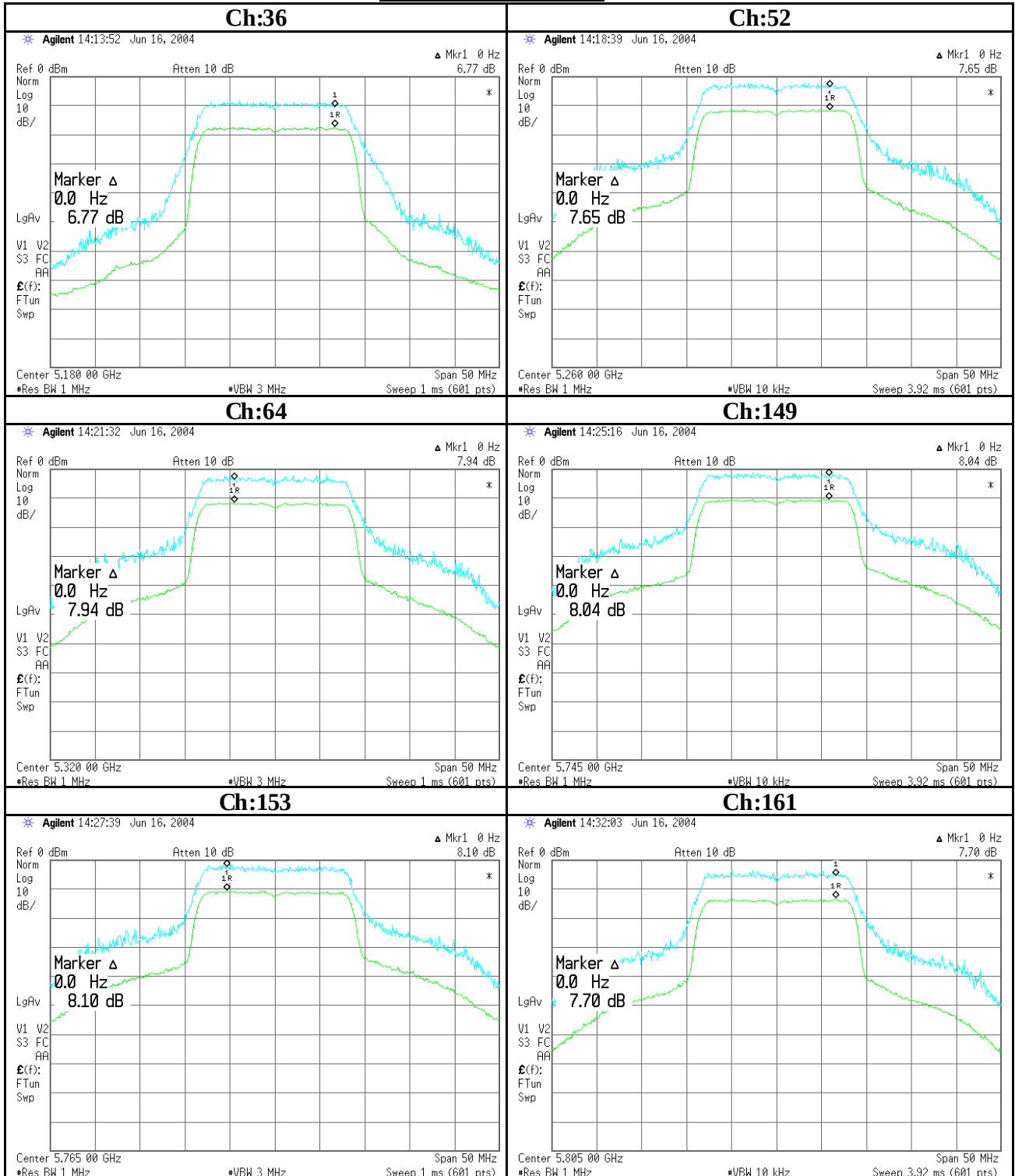
Peak Excursion Ratio

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

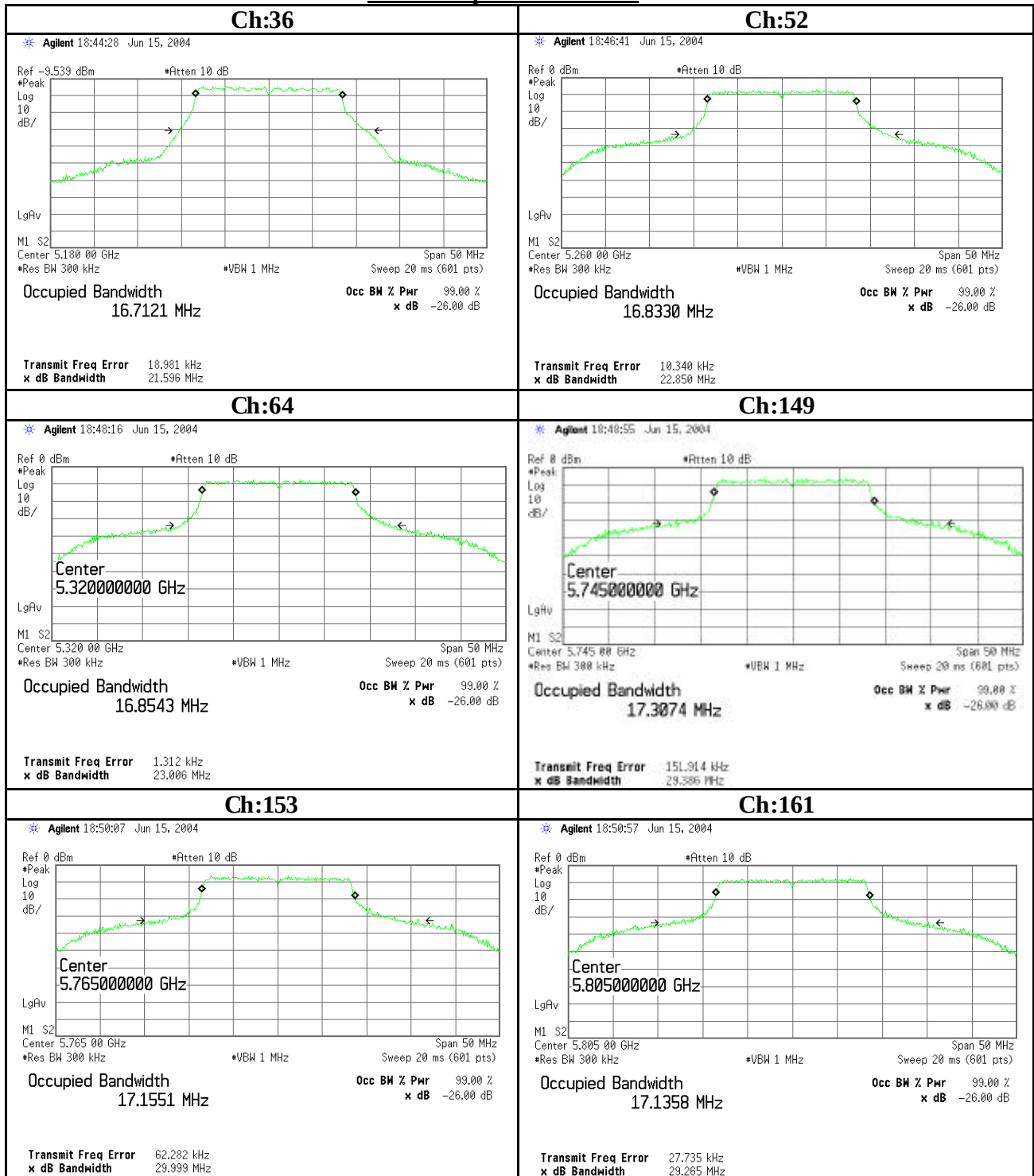
Company	: Sony Corporation	REPORT NO	: 24HE0082-HO
Equipment	: Wireless LAN Module	REGULATION	: FCC 15.407(a)(6)
Model	: IRF302U	TEST DISTANCE	: -
Sample No.	: 11	DATE	: 06/16/2004
Power	: DC3.3V	TEMPERATURE	: 24deg.C
Mode	: Tx IEEE 802.11a 54Mbps	HUMIDITY	: 48%
		ENGINEER	: Hiroka Umeyama

Ch	Freq. [MHz]	Peak Power Excursion [dB]	Limit [dB]
36	5180.0	6.770	13.0
52	5260.0	7.650	13.0
64	5320.0	7.940	13.0
149	5745.0	8.040	13.0
153	5765.0	8.100	13.0
161	5805.0	7.700	13.0

Peak Excursion Ratio



99% Occupied Bandwidth

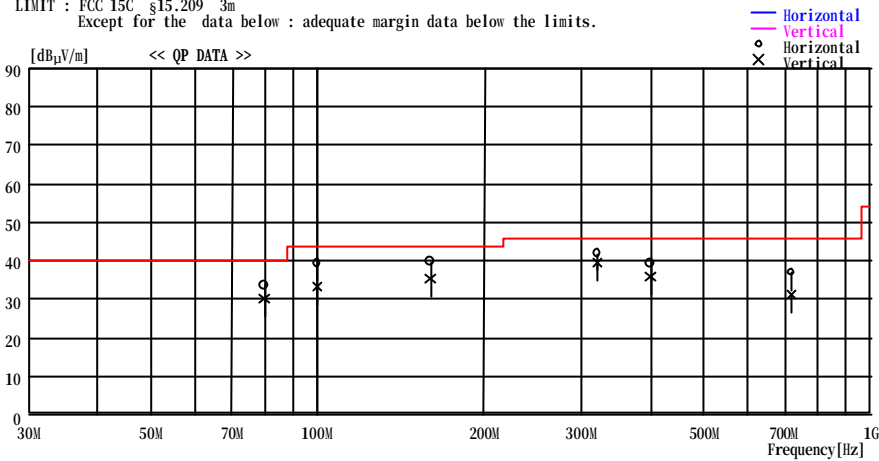


Additional Data : Radiated Spurious Emission (long antenna cable)

DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125
Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 27 deg.C. / 55 %
Operator : Hiroka Umeyama
Mode / Remarks :Transmitting IEEE802.11a,54Mbps,ch 64(5320MHz)(MAX) HOR:X-Axis,VER:Z-Axis(MAX) antenna cable 20cm(MAX)
LIMIT : FCC 15C §15.209 3m
Except for the data below : adequate margin data below the limits.



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	160.000	40.0	15.2	7.6	23.0	39.8	43.5	3.7	270	66
2	320.000	41.4	14.9	8.4	22.9	41.8	46.0	4.2	100	230
----- Vertical -----										
3	160.000	35.5	15.2	7.6	23.0	35.3	43.5	8.2	230	0
4	320.000	39.1	14.9	8.4	22.9	39.5	46.0	6.5	130	130

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

DATA OF RADIATED EMISSION TEST

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

Applicant

Kind of EUT

Model No.

Serial No.

: Sony Corporation

: Wireless LAN Module

: IRF302U

: 125

Report No.

Power

Temp./Humi.

Operator

: 24HE0082-H0

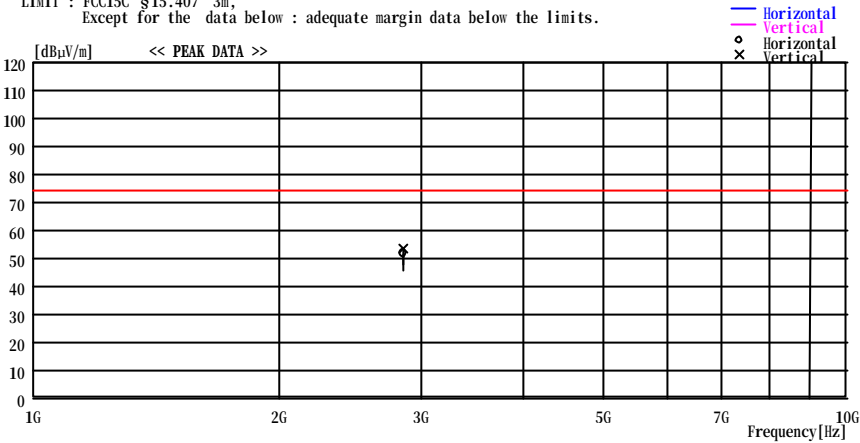
: DC 3.3V

: 25 deg.C. / 60 %

: Hiroka Umeyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch64(5320MHz)(MAX), HOR/VER:Z-Axis(MAX) antenna cable 20cm(MAX)

LIMIT : FCC15C §15.407 3m,
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING PK [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	
----- Horizontal -----									
1	2847.000	49.0	32.0	7.0	36.4	51.6	74.0	22.4	Tx:Ch64
----- Vertical -----									
2	2847.000	51.0	32.0	7.0	36.4	53.6	74.0	20.4	Tx:Ch64

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

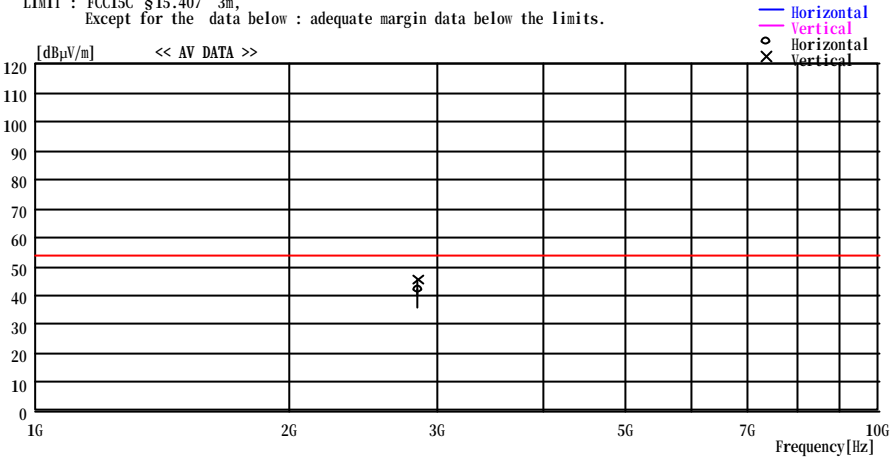
DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125
Report No. : 24HE0082-HO
Power : DC 3.3V
Temp./Humi. : 25 deg.C. / 60 %
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, ch64(5320MHz)(MAX), HOR/VER:Z-Axis(MAX) antenna cable 20cm(MAX)

LIMIT : FCC15C §15.407 3m,
Except for the data below : adequate margin data below the limits.



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	
	[MHz]	AV	FACTOR	[dB]	[dB]	[dBµV/m]	[dBµV/m]	[dB]	
		[dBµV]	[dB/m]						
----- Horizontal -----									
1	2847.000	39.5	32.0	7.0	36.4	42.1	54.0	11.9	TxCh64
----- Vertical -----									
2	2847.000	43.2	32.0	7.0	36.4	45.8	54.0	8.2	TxCh64

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

Radiated emission Band Edge compliance

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

COMPANY	Sony Corporation	REPORT NO	24HE0082-HO
EQUIPMENT	Wireless LAN Module	REGULATION	FCC15.407
MODEL	IRF302U	TEST DISTANCE	3m
S/N	125	DATE	30/06/2004
POWER	DC3.3V	TEMPERATURE	25°C
MODE	Tx 5180/5320/5745/5805	HUMIDITY	60%
POSITION	H: Z-axis / V: Z-axis	CALIBRATION	OK
TX ANTENNA HIGH	0.8m	ENGINEER	Hiroka Umeyama

No.	FREQUENCY [MHz]	(After Factor Calculation) [dBuV/m]		RESULT (EIRP) [dBm] (dBm)		LIMIT [dBm] (EIRP)	MARGIN [dB]		Mode
		HOR	VER	HOR	VER		HOR	VER	
3	5715.00	62.6	62.6	-40.1	-39.9	-27.0	13.1	12.9	Operating
4	5725.00	74.7	75.0	-27.9	-27.5	-17.0	10.9	10.5	Operating
5	5825.00	73.5	72.1	-29.0	-30.2	-17.0	12.0	13.2	Operating
6	5835.00	58.7	57.7	-43.8	-44.6	-27.0	16.8	17.6	Operating

Tx:Ch149
Tx:Ch149
Tx:Ch161
Tx:Ch161

Rx-ANTENNA : Biconical Antenna(25-300MHz), Logperiodic Antenna(300-1000MHz), Horn Antenna(1-12.75GHz)
Tx-ANTENNA : Dipole Antenna(25-1000MHz), Horn Antenna(1-12.75GHz)

With the result above, the effective radiated power was calculated on the basis of the reference value
- for the calibration data on the substitution measurement.
Result is calculated to two places of decimals. Therefore, there may be 0.1 difference for the result.

PK DETECT												
(RBW: 1MHz, VBW:1MHz)												
No.	FREQ	S/A READING		ANT	AMP	CABLE	Band-Pass	RESULT		Limit	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBm]	[dBm]					[dBm]	[dBm]		[dBm]	[dBm]
[MHz]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]	[dBm]
Test distance 3meters. RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	5150.0	41.5	40.0	36.3	35.9	9.9	0.0	51.8	50.3	74.0	22.2	23.7
2	5350.0	53.2	55.2	36.2	35.8	10.0	0.0	63.6	65.6	74.0	10.4	8.4

Tx:Ch36
Tx:Ch64

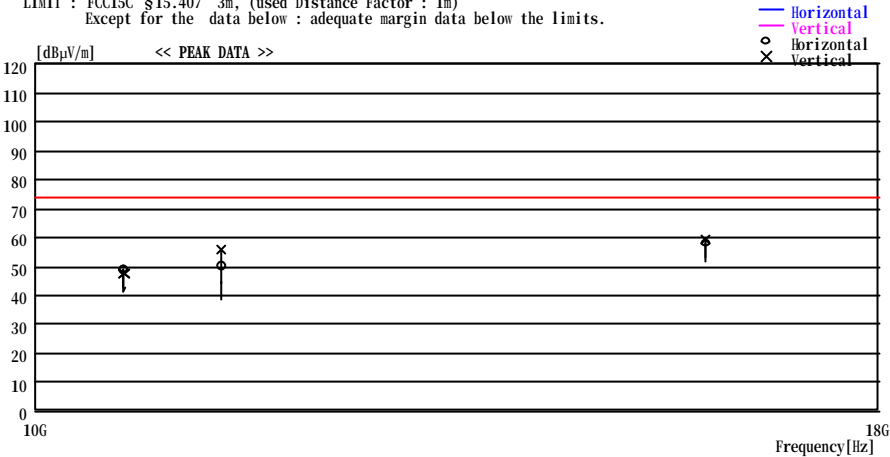
AV DETECT (RBW: 1MHz, VBW:10Hz)												
No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
Test distance 3meters. RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	5150.0	30.6	31.0	36.3	35.9	9.9	0.0	40.9	41.3	54.0	13.1	12.7
2	5350.0	34.5	37.2	36.2	35.8	10.0	0.0	44.9	47.6	54.0	9.1	6.4

Tx:Ch36
Tx:Ch64

DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125
Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C. / 60 %
Operator : Hiroka Umeyama
Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, Ch64(5320MHz)(MAX) HOR/VER:Z-Axis(MAX) antenna cable 20cm(MAX)
LIMIT : FCC15C §15.407 3m, (used Distance Factor : 1m)
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING PK [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	
----- Horizontal -----									
1	10640.000	31.7	37.9	15.1	35.7	49.0	74.0	25.0	TxCh64
2	11388.000	31.1	39.4	15.1	35.5	50.1	74.0	23.9	TxCh64
3	15960.000	32.4	43.3	18.8	36.4	58.1	74.0	15.9	TxCh64
----- Vertical -----									
4	10640.000	31.6	37.9	15.1	35.7	48.9	74.0	25.1	TxCh64
5	11388.000	36.7	39.4	15.1	35.5	55.7	74.0	18.3	TxCh64
6	15960.000	33.6	43.3	18.8	36.4	59.3	74.0	14.7	TxCh64

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

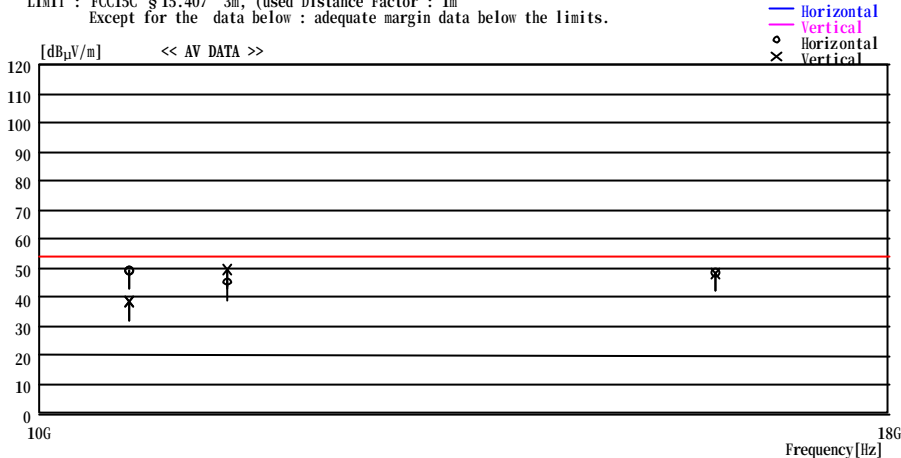
DATA OF RADIATED EMISSION TEST

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

Applicant : Sony Corporation
Kind of EUT : Wireless LAN Module
Model No. : IRF302U
Serial No. : 125
Report No. : 24HE0082-HO
Power : DC 3.3V / distance 1m
Temp./Humi. : 25 deg.C. / 60 %
Operator : Hiroka Uneyama

Mode / Remarks : Transmitting IEEE802.11a, 54Mbps, Ch64(5320MHz)(MAX) HOR/VER:Z-Axis(MAX) antenna cable 20cm(MAX)

LIMIT : FCC15C §15.407 3m, (used Distance Factor : 1m
Except for the data below : adequate margin data below the limits.



No. FREQ READING ANT LOSS GAIN RESULT LIMIT MARGIN
[MHz] [dB_μV] [dB/m] [dB] [dB] [dB_μV/m] [dB_μV/m] [dB]

----- Horizontal -----

1	10640.000	21.2	37.9	15.1	35.7	38.5	54.0	15.5	TxCh64
2	11388.000	26.0	39.4	15.1	35.5	45.0	54.0	9.0	TxCh64
3	15960.000	22.5	43.3	18.8	36.4	48.2	54.0	5.8	TxCh64

----- Vertical -----

4	10640.000	21.2	37.9	15.1	35.7	38.5	54.0	15.5	TxCh64
5	11388.000	30.2	39.4	15.1	35.5	49.2	54.0	4.8	TxCh64
6	15960.000	22.5	43.3	18.8	36.4	48.2	54.0	5.8	TxCh64

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