



RADIO TEST REPORT

Test Report No. : 27IE0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Type of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
FCC ID : BBP-WLRWL541
Test Standard : FCC Part15 Subpart E: 2007
FCC Part15 Subpart B: 2007
Test Result : Complied

1. This test report shall not be reproduced except in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. Original test report number of this report is 27IE0337-YK-B.

Date of test: May 15, 17, 24, December 3, 4 and 5, 2007

Tested by:

Takahiro Suzuki

&

Tatsuya Arai

Approved by:

Osamu Watatani
Manager of Yamakita EMC Lab.

UL Japan, Inc.

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1 Applicant Information

Company Name : RICOH COMPANY, LTD.
Address : 810 Shimoimaizumi, Ebina-shi, Kanagawa-ken, 243-0460 Japan
Telephone Number : +81-46-292-6870
Facsimile Number : +81-46-231-9183
Contact Person : Shinji Okada

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

2.1 Identification of E.U.T.

Type of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Rating : DC3.3V
Country of Manufacture : Japan
Receipt Date of Sample : May 9, 2007
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model: R-WL54MN (referred to as the EUT in this report) is Option(s) for Radiocommunications.

Equipment type : Transceiver
Frequency of operation : [11b/g] 2412-2462MHz *1)
[11a] 5180-5320MHz
Clock frequency : 11MHz, 20MHz
Bandwidth & channel spacing : [11b/g] 22MHz & 5MHz
[11a] 18MHz & 20MHz
Type of modulation : IEEE802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM)
IEEE802.11b: DSSS (DBPSK, DQPSK, CCK)
IEEE802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Power control : None
Antenna type : Monopole
Antenna 1: Transmitting & Receiving
Antenna 2: Receiving only
Antenna connector type : None
Antenna gain : [11b/g] max +3dBi
[11a] max +4dBi
ITU code : D1D, G1D
Operation temperature range : 0 ~ +65 deg.C.

*1) Refer to 27IE0337-YK-A, FCC part 15C (FCC 15.247) report.

FCC 15.31 (e)

The RICOH product provides stable voltage (DC3.3V) constantly to the EUT (RF Module) regardless of input voltage. Therefore, the EUT complies with the requirement.

FCC Part 15.203

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3 Test Specification, Procedures and Results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2007
Title : FCC 47CFR Part 15 Radio Frequency Device
Subpart B Unintentional Radiators
Test specification : FCC Part15 Subpart E: 2007
Title : FCC 47CFR Part15 Radio Frequency Device
Subpart E Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted Emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC 15.107(a), 15.407 (b)(6) and 15.207	-	N/A	22.9dB (19.9998MHz, Tx 5200MHz, N, QP / 19.9997MHz, Tx 5280MHz, N, QP)	Complied
26dB Emission Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407(a)(1)(2)	Conducted	N/A	See data	Complied
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)	Conducted	N/A		Complied
Peak Power Spectral Density	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)	Conducted	N/A		Complied
Peak Excursion Ratio	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)(3)	Conducted	N/A		Complied
Out of Band Emission & Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.109, 15.407 (b)(1)(2)(4)(5) (7), 15.205 and 15.209	Conducted / Radiated	N/A	Tx: 1.5dB (15780.00MHz, Horizontal, Tx 5260MHz) Rx: 2.0dB (147.76MHz, Horizontal, Rx 5260MHz)	Complied
Dynamic Frequency Selection	FCC 06-96 APPENDIX	FCC 15.407 (h)(2)	Conducted	*1)	N/A	N/A
Antenna power conduction for receivers	ANSI C63.4: 2003 12.1.5 Antenna-conducted power measurements	FCC 15.111 (a)	-	N/A *2)	-	N/A

Note: UL Japan's EMI Work Procedures No.QPM05.

*1) Refer to 27KE0096-HO-A, FCC part 15E (FCC 15.407) DFS report.

*2) The test is not applicable since the EUT does not tune in the frequency range 30 to 960MHz.

*These tests were also referred to FCC Public Notice DA02-2138 "Measurement Procedure Updated for Peak Transmit Power in the Unlicensed National Information Infrastructure (U-NII) Bands".

** Other than mentioned in 3.3, no addition, exclusion nor deviation has been made from the standard.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators RSS-Gen 4.4.1	RSS-Gen 4.4.1	Conducted	-	Complied

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3.4 Uncertainty

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

	No.1 open site	No.2 open site	No.1 anechoic chamber
Conducted emission			
150kHz-30MHz	2.8 dB	2.8 dB	2.8 dB
Radiated emission (3m)			
30-300MHz	4.5 dB	4.4 dB	4.5 dB
300-1000MHz	4.3 dB	4.3 dB	4.3 dB
1GHz<	5.7 dB	5.7 dB	5.7 dB

Antenna port conducted test	
Below 1GHz	±0.4dB
1GHz and above	±0.7dB

Conducted Emission Test

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

Radiated Emission Test

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

3.5 Test Location

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Telephone number : +81 465 77 1011

Facsimile number : +81 465 77 2112

NVLAP Lab. code : 200441-0

No. 1 test site has been fully described in a report submitted to FCC office, and accepted on August 26, 2005 (Registration No.: 95486).

IC Registration No. : 2973B-1

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on April 4, 2005 (Registration No.: 466226).

IC Registration No. : 2973B-3

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on November 2, 2005 (Registration No.: 95967).

IC Registration No. : 2973B-2

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 shielded room	8.0 x 5.0 x 2.5	No.1	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5	Semi-anechoic chamber	
No.3 shielded room	4.0 x 5.0 x 2.7		

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4 System Test Configuration

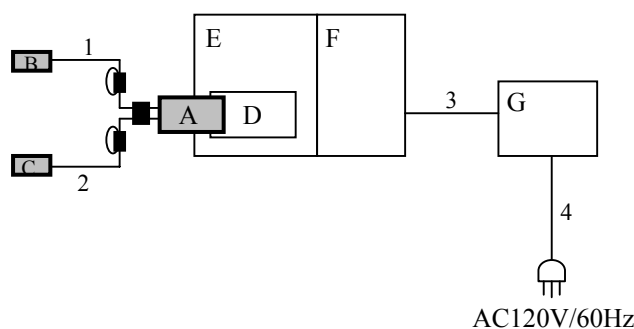
4.1 Justification

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

Transmitting (IEEE802.11a (54Mbps))	Lower band (5150MHz-5250MHz)
	-5180MHz (Low)
	-5200MHz (Middle)
	-5240MHz (High)
	Upper band (5250MHz-5350MHz)
	-5260MHz (Low)
	-5280MHz (Middle)
	-5320MHz (High)
Receiving (IEEE802.11a (54Mbps))	-5260MHz

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 the IEEE 802.11a OFDM (64QAM, 54Mbps) modulation as the highest data rate.

4.2 Configuration of Tested System



* 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	Option(s) for Radiocommunications	R-WL54MN	704S0191	RICOH	BBP-WLRWL541 (EUT)
B	Antenna 1	ANT0602-	D3775683	NISSEI	(EUT)
C	Antenna 2	WMFW/N-AB		ELECTRIC	
D	Extension board1	ABN105623	-	RICOH	(Jig)
E	Controller board	Type-DC	D0095742	RICOH	(Jig)
F	Extension board2	WBG226714	-	RICOH	(Jig)
G	PSU	MPT-400	2301218427	RICOH	(Jig)

List of cables used *1)

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Antenna cable	0.9	Shielded	Shielded	(for antenna 1)
2	Antenna cable	0.9	Shielded	Shielded	(for antenna 2)
3	DC cable	0.7	Unshielded	Unshielded	-
4	AC cable	1.5	Unshielded	Unshielded	-

*1) All cables used for the measurement are exclusive use or marketed.

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5 Conducted Emissions

5.1 Operating environment

The test was carried out in No.2 shielded room.

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.8m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of 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 a Line Impedance Stabilization Network (LISN) and excess AC cable was bundled in center. A drawing of the set up is shown in the photos of Appendix 1.

5.3 Test conditions

Frequency range : 0.15 - 30MHz
EUT operation mode : Transmitting, Receiving

5.4 Test procedure

The PSU was connected to a LISN (AMN). An overview sweep with peak detection has been performed. The Conducted emission measurements were made with the following detector function of the test receiver.

Detector: QP/AV
IF Bandwidth: 9kHz

5.5 Results

Summary of the test results : Pass
Date : May 17 and December 3, 2007

Test engineer : Takahiro Suzuki and Tatsuya Arai

6 26dB Bandwidth & Occupied Bandwidth (99%)

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Date: May 24 and December 5, 2007

Test engineer : Tatsuya Arai

7 Maximum Peak Output Power

Test Procedure

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

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

We followed the method 1 specified in DA-02-2138A1.

Summary of the test results: Pass

Date: May 24 and December 5, 2007

Test engineer : Tatsuya Arai

8 Peak Power Spectral Density

Test Procedure

The peak power spectral density was measured with a spectrum analyzer connected to the antenna port.

We followed the method 2 specified in DA-02-2138A1.

Summary of the test results: Pass

Date: May 24 and December 5, 2007

Test engineer : Tatsuya Arai

9 Peak Excursion Ratio

Test Procedure

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

The second sweep was measured based on method 1 specified in DA-02-2138A1

Summary of the test results: Pass

Date: May 24 and December 5, 2007

Test engineer : Tatsuya Arai

10 Out of Band Emissions (Antenna Port Conducted)

Test Procedure

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

Summary of the test results: Pass

Date: May 24 and December 5, 2007

Test engineer : Tatsuya Arai

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11 Out of Band Emissions (Radiated)

11.1 Operating environment

The test was carried out in No.1 anechoic chamber.

11.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane. A drawing of the set up is shown in the photos of Appendix 1.

11.3 Test conditions

Frequency range : 30MHz – 18GHz / 18GHz – 40GHz
 Test distance : 3m / 1m
 EUT operation mode : Transmitting, Receiving

11.4 Test procedure

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m for 30MHz-18GHz and 1m for 18GHz-40GHz.

The measuring antenna height was 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.

Measurements were performed with QP, PK, and AV detector.

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

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

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
Detector IF Bandwidth	QP: BW 120kHz	PK: RBW: 1MHz/VBW: 1MHz, AV: RBW: 1MHz/VBW: 10Hz
Measuring antenna	Biconical (30-300MHz) Logperiodic (300MHz-1GHz)	Horn

The equipment and its antenna were previously checked at each position of three axes X, Y and Z. The position in which the maximum noise occurred was chosen to put into measurement. See the table below and photographs in page 13. With the position, the noise levels of all the frequencies were measured.

Model	Worst position	
	Below 1GHz	Above 1GHz
Module	Horizontal: X, Vertical: Z	Horizontal: X, Vertical: X
Antenna	Horizontal: X, Vertical: Z	Horizontal: X, Vertical: Y

11.5 Results

Summary of the test results : Pass
 No noise was detected above the 5th order harmonics.

Date: May 15, 17, December 3 and 4, 2007

Test engineer : Takahiro Suzuki and Tatsuya Arai

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APPENDIX 1: Photographs of test setup

Page 11	:	Conducted emission
Page 12	:	Radiated emission
Page 13	:	Pre check of worse-case position

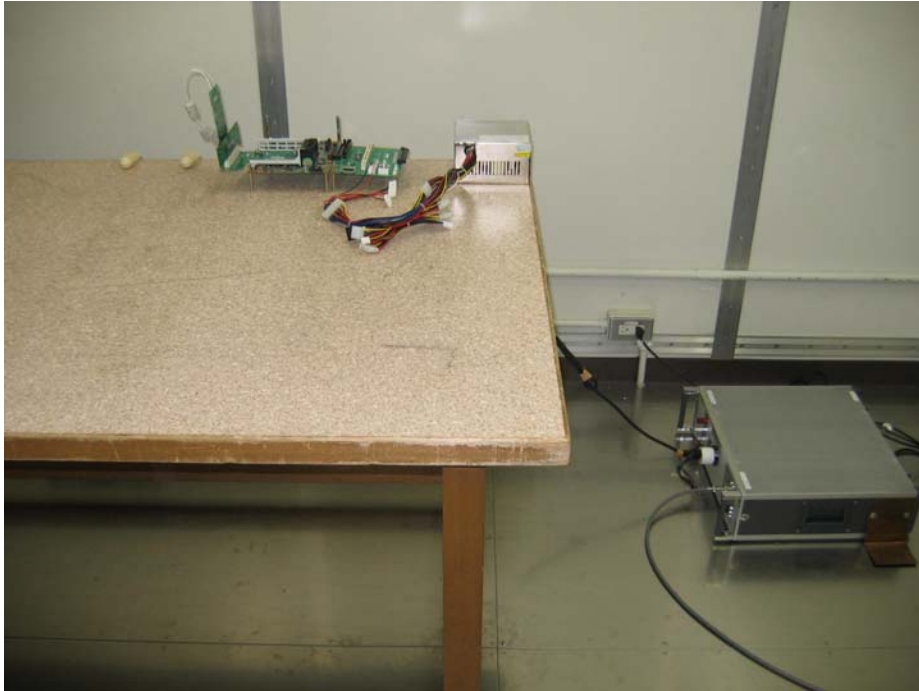
APPENDIX 2: Test Data

Page 14 - 24	:	Conducted emission
Page 25 - 26	:	26dB Bandwidth
Page 27 - 29	:	Maximum Peak Output Power
Page 30 - 32	:	Peak Power Spectral Density
Page 33 - 34	:	Peak Excursion Ratio
Page 35 - 50	:	Out of Band Emissions (Antenna Port Conducted)
Page 51 - 70	:	Out of Band Emissions (Radiated)
Page 71	:	Occupied Bandwidth

APPENDIX 3: Test instruments

Page 73	:	Test instruments
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Conducted emission



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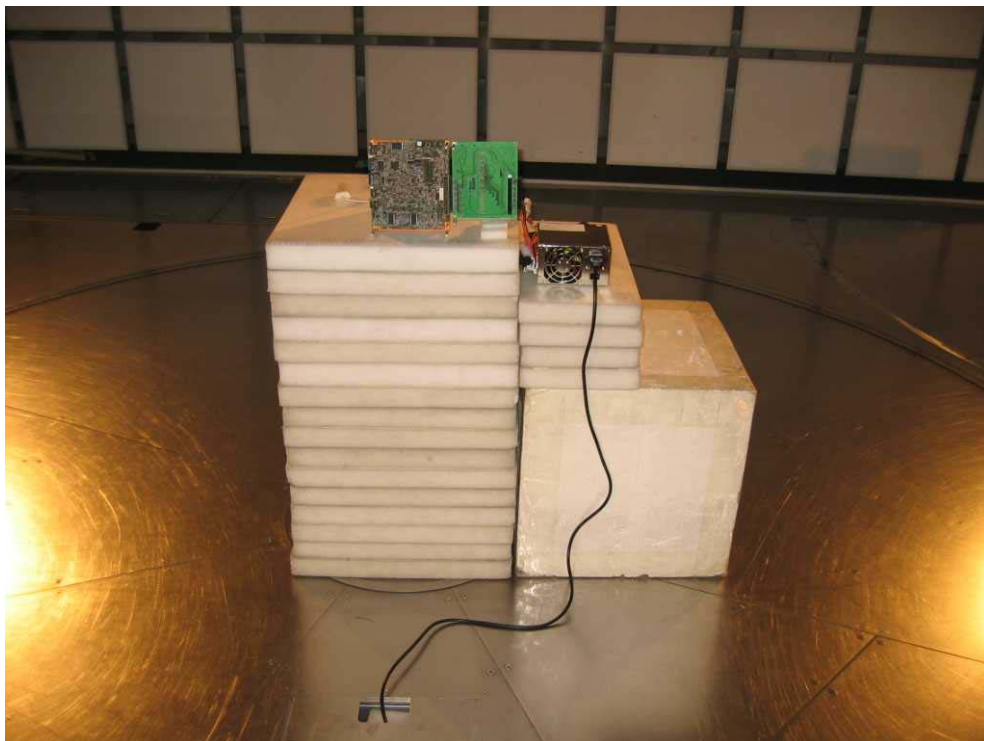
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Radiated emission



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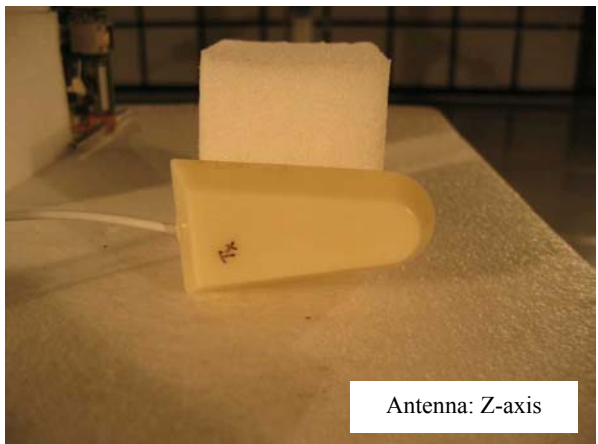
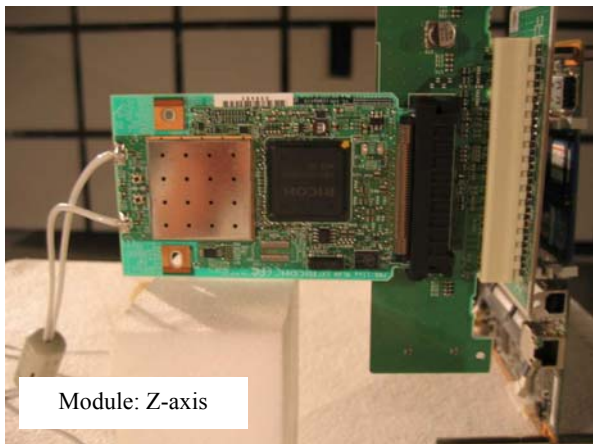
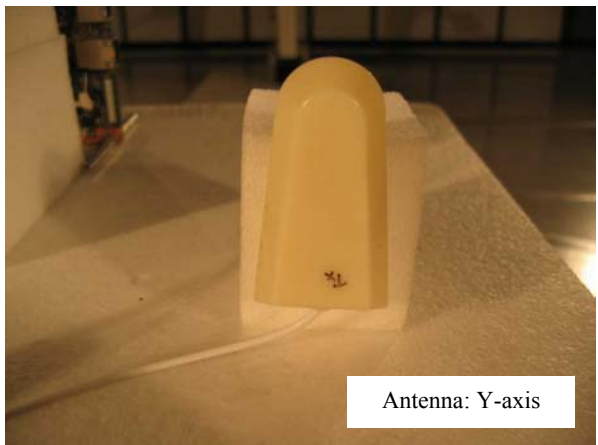
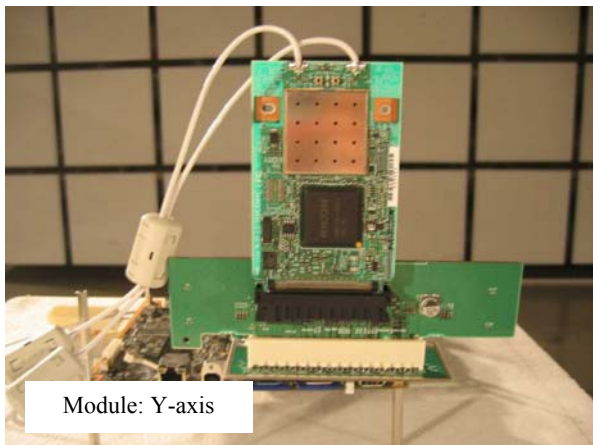
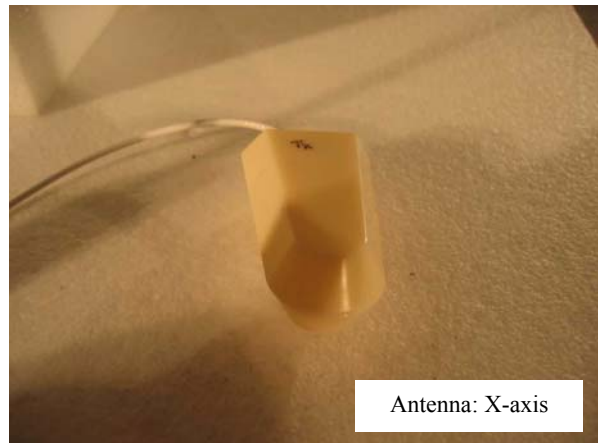
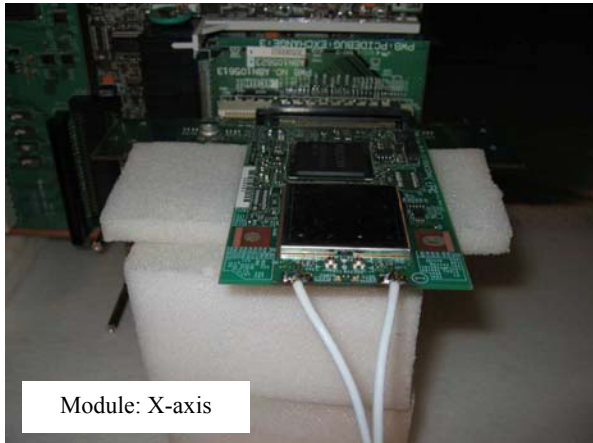
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Pre-check of the worst position



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DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 27IE0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5200MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C Engineer : Tatsuya Arai
Humidity : 39 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μV]	AV [dB μV]	QP [dB μV]	AV [dB μV]				QP [dB]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]
1.	0.1573	34.1	—	34.5	—	0.1	0.1	0.0	34.7	—	65.6	55.6	30.9	—
2.	0.1837	34.2	—	34.5	—	0.1	0.1	0.0	34.7	—	64.3	54.3	29.6	—
3.	0.3319	29.7	—	26.0	—	0.1	0.1	0.0	29.9	—	59.4	49.4	29.5	—
4.	0.6322	28.8	—	28.7	—	0.1	0.1	0.0	29.0	—	56.0	46.0	27.0	—
5.	15.4573	33.1	—	32.6	—	0.4	0.6	0.0	34.1	—	60.0	50.0	25.9	—
6.	19.9998	35.8	—	35.3	—	0.6	0.7	0.0	37.1	—	60.0	50.0	22.9	—

CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

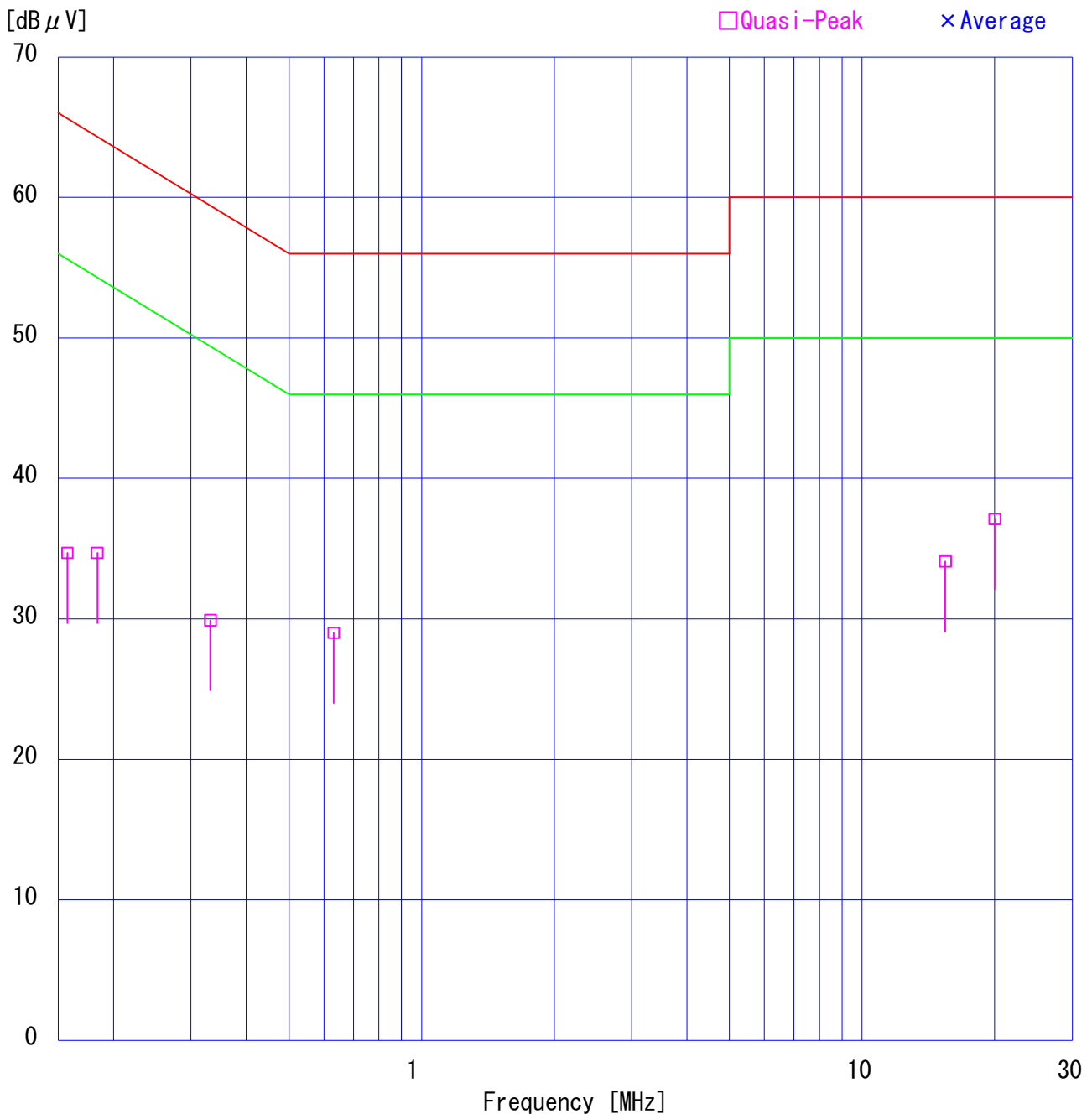
■ KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-33/34
■ EMI RECEIVER: KTR-03 (ESHS10)

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Report No. : 27IE0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5200MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)

Engineer : Tatsuya Arai



Page:

DATA OF CONDUCTION TEST CHART

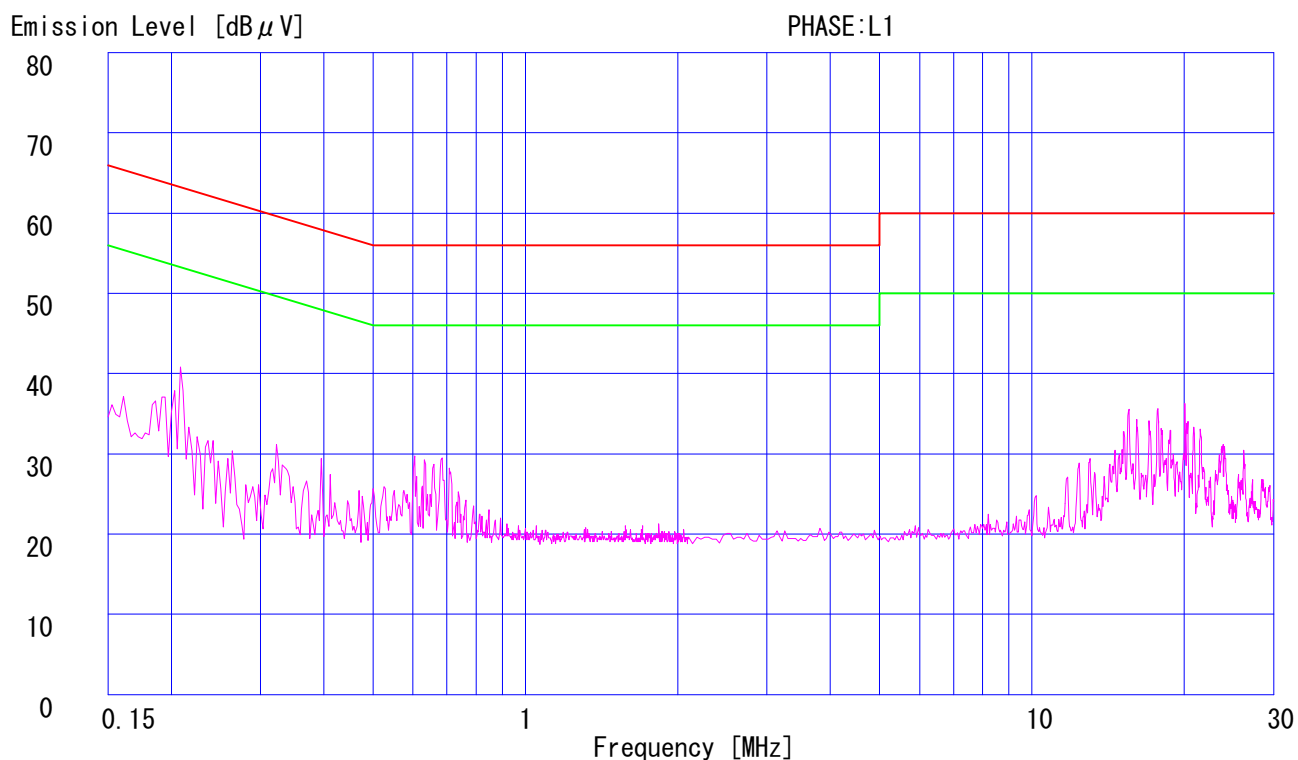
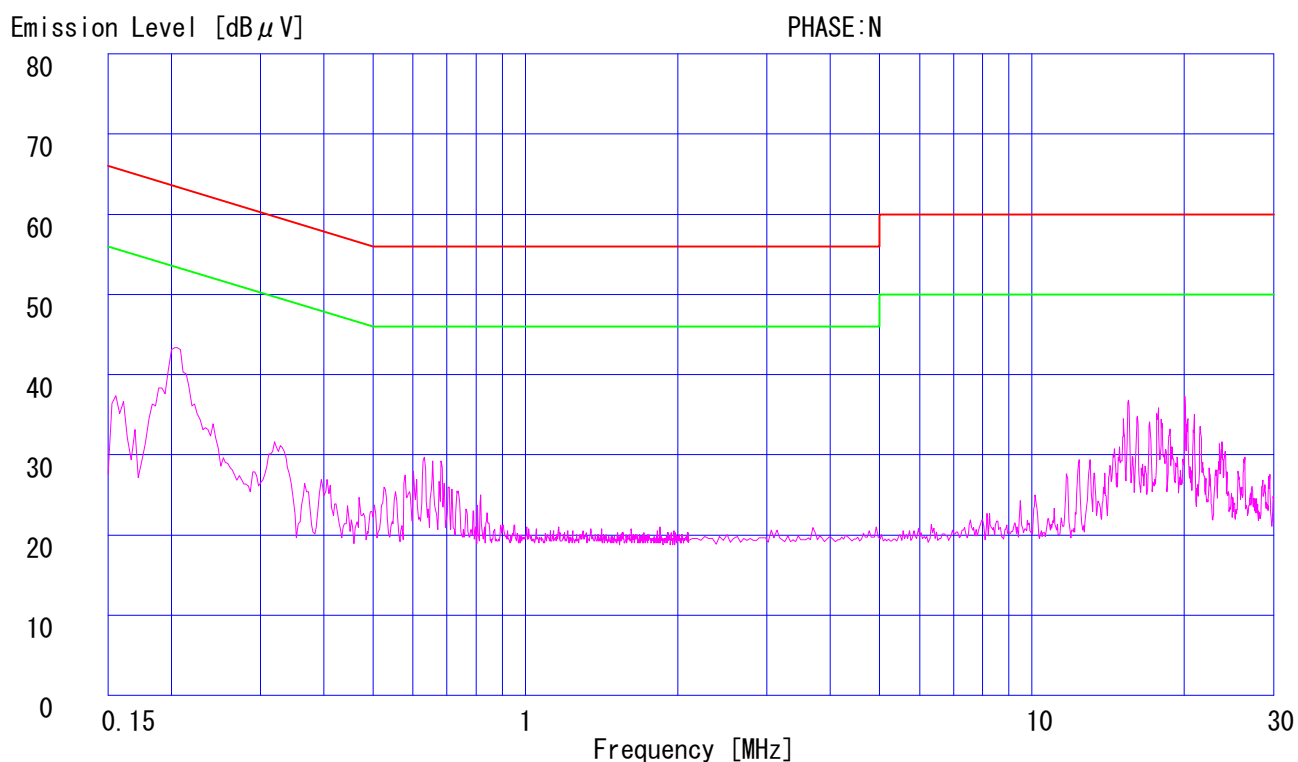
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Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5200MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

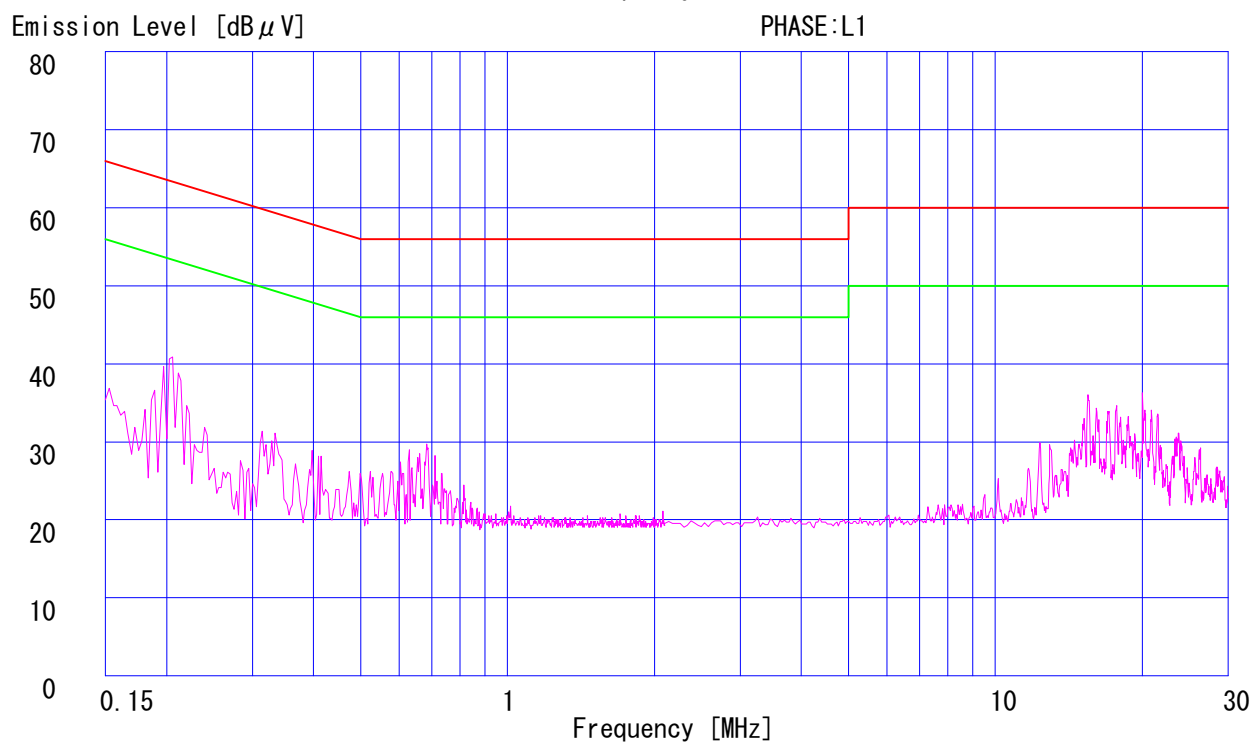
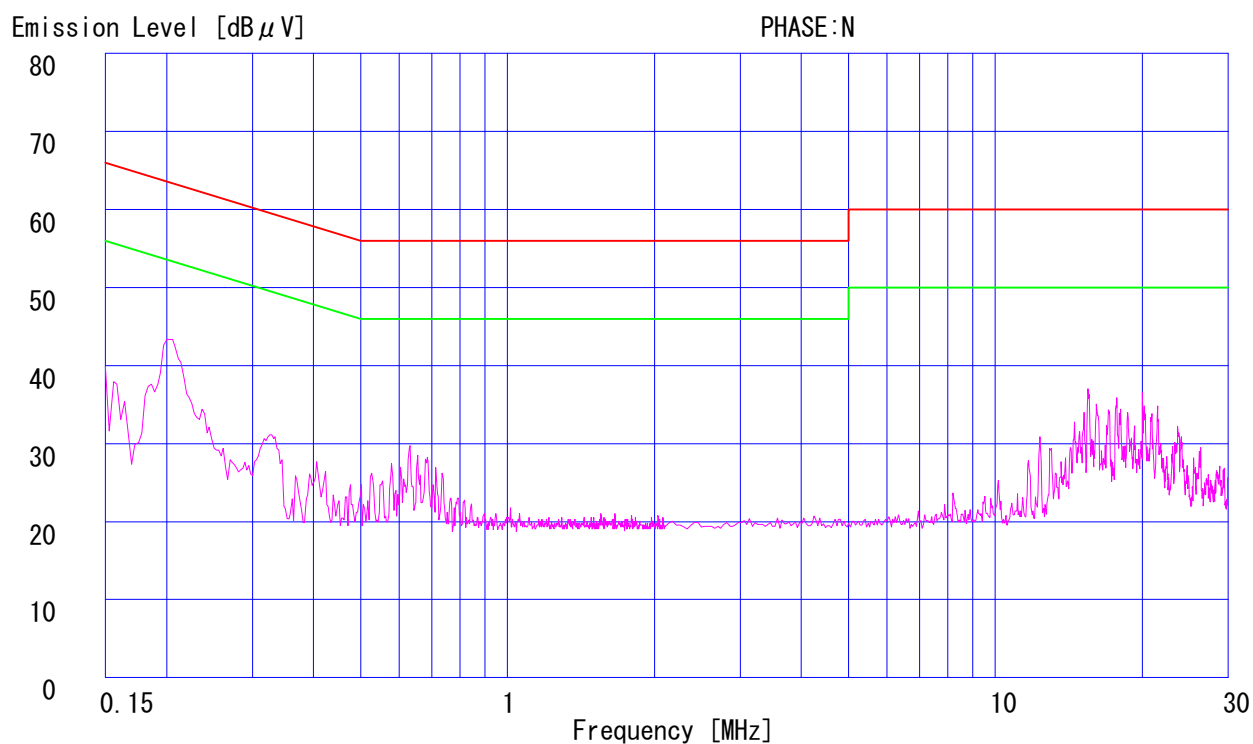
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Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5180MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Tatsuya Arai



Page :

DATA OF CONDUCTION TEST CHART

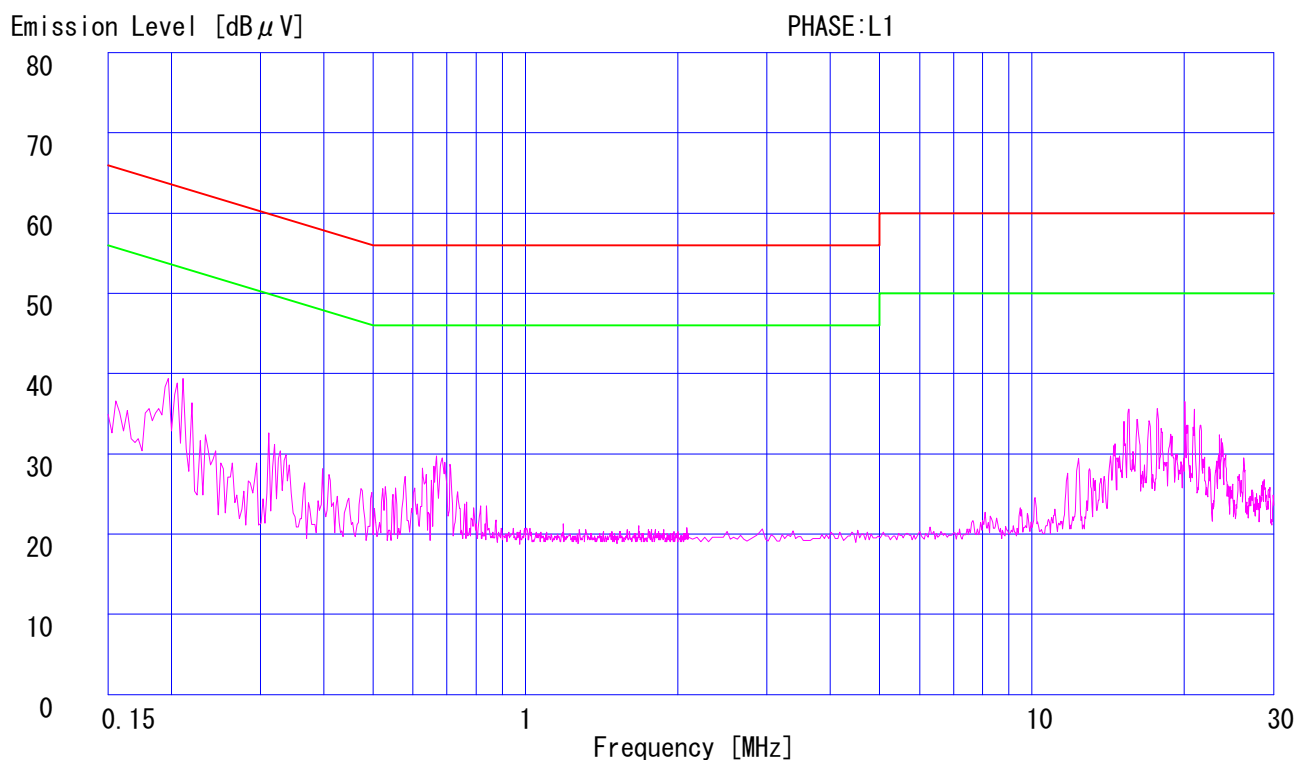
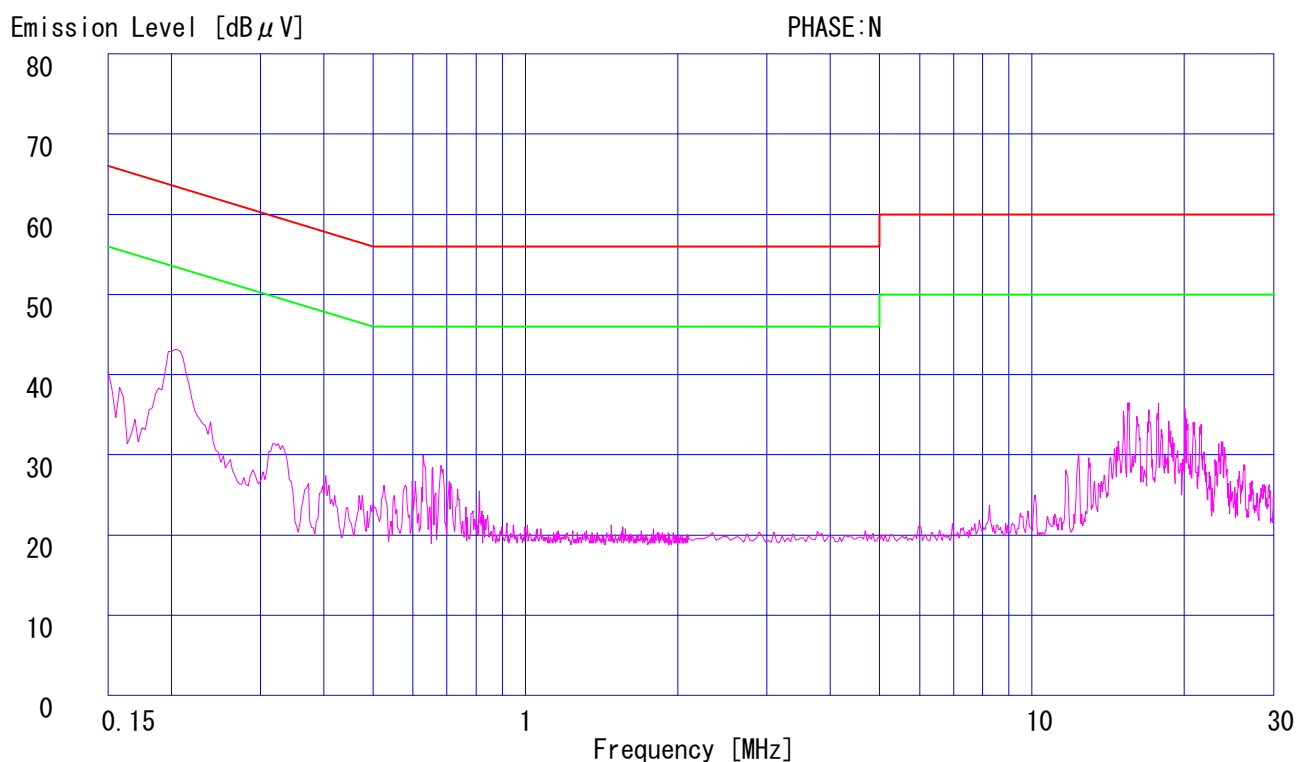
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 271E0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5240MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 27IE0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting(5280MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C Engineer : Tatsuya Arai
Humidity : 39 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)

No.	FREQ. [MHz]	READING(N)		READING(L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μ V]	AV	QP [dB μ V]	AV				QP [dB]	AV [dB μ V]	QP [dB μ V]	AV [dB μ V]	QP [dB]	AV [dB]
1.	0.1575	34.1	—	34.4	—	0.1	0.1	0.0	34.6	—	65.6	55.6	31.0	—
2.	0.1837	34.5	—	34.6	—	0.1	0.1	0.0	34.8	—	64.3	54.3	29.5	—
3.	0.3303	30.0	—	26.5	—	0.1	0.1	0.0	30.2	—	59.4	49.4	29.2	—
4.	0.6315	28.9	—	28.7	—	0.1	0.1	0.0	29.1	—	56.0	46.0	26.9	—
5.	15.4557	33.0	—	32.2	—	0.4	0.6	0.0	34.0	—	60.0	50.0	26.0	—
6.	19.9997	35.8	—	35.3	—	0.6	0.7	0.0	37.1	—	60.0	50.0	22.9	—

CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

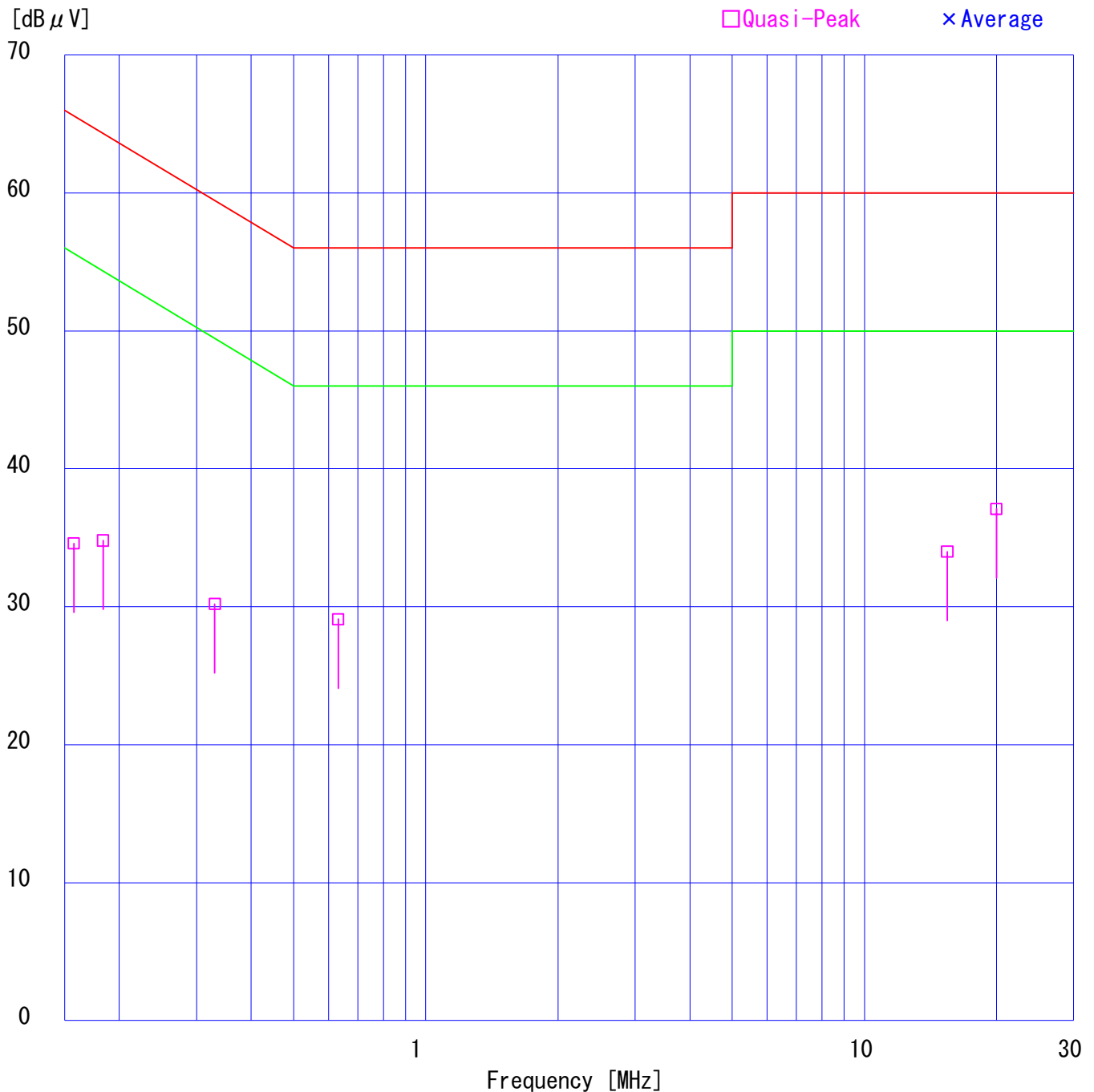
■ KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-33/34
■ EMI RECEIVER: KTR-03 (ESHS10)

DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 27IE0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting(5280MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

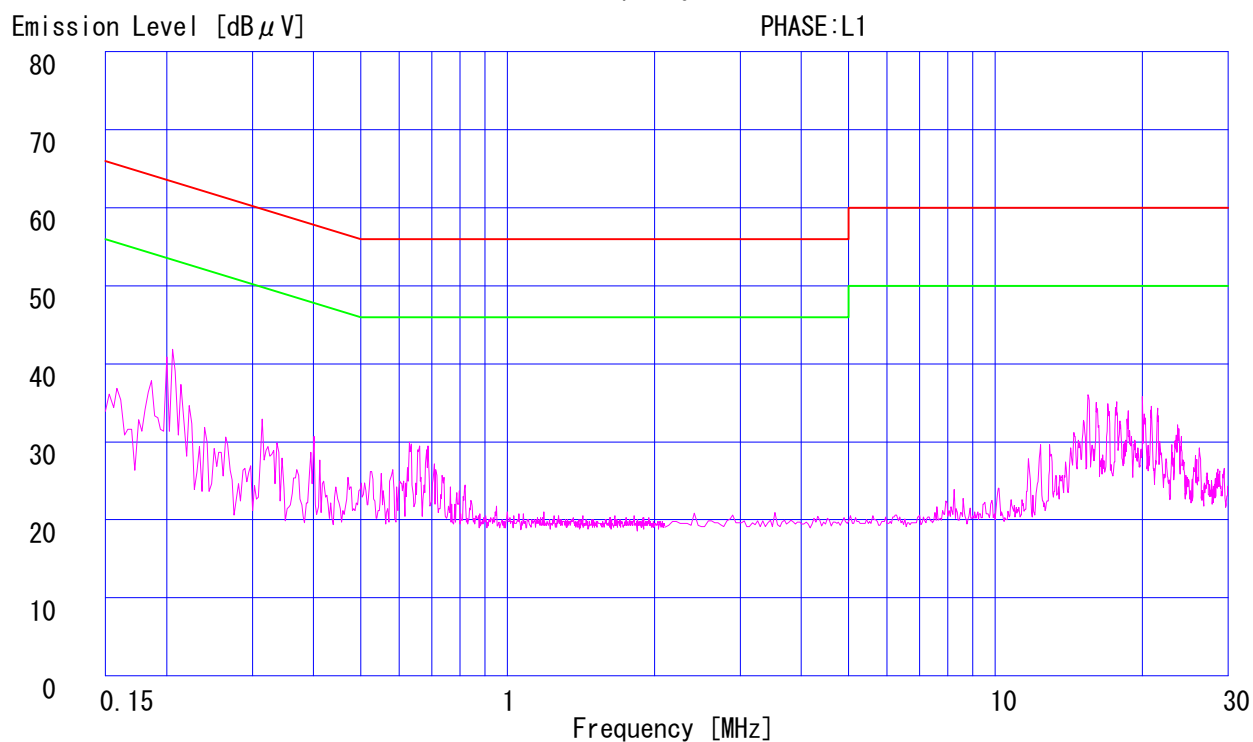
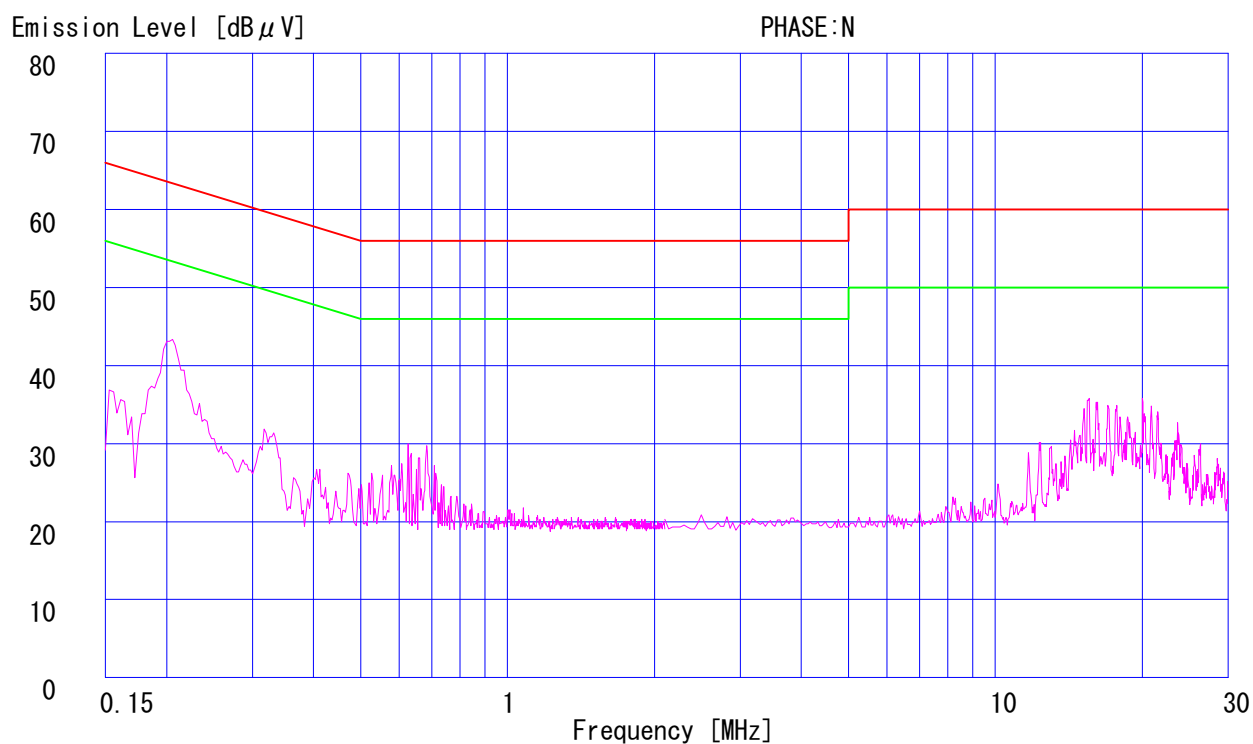
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 271E0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5280MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



Page :

DATA OF CONDUCTION TEST CHART

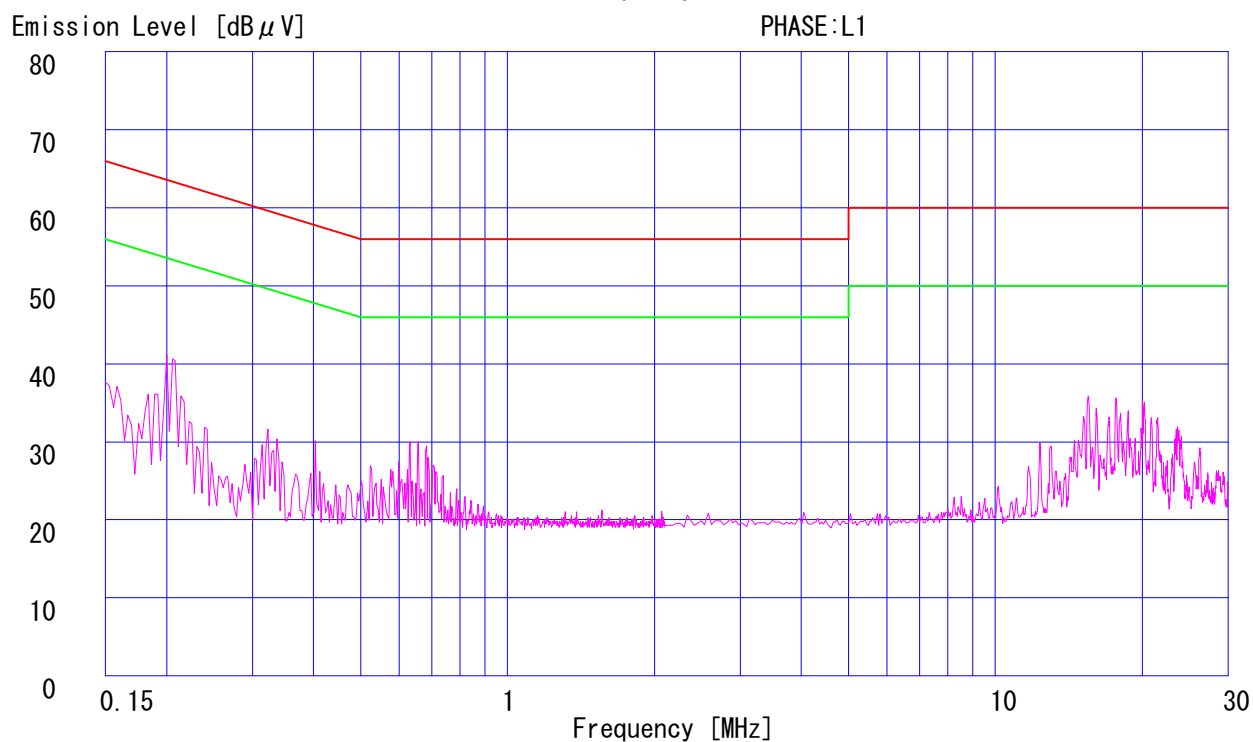
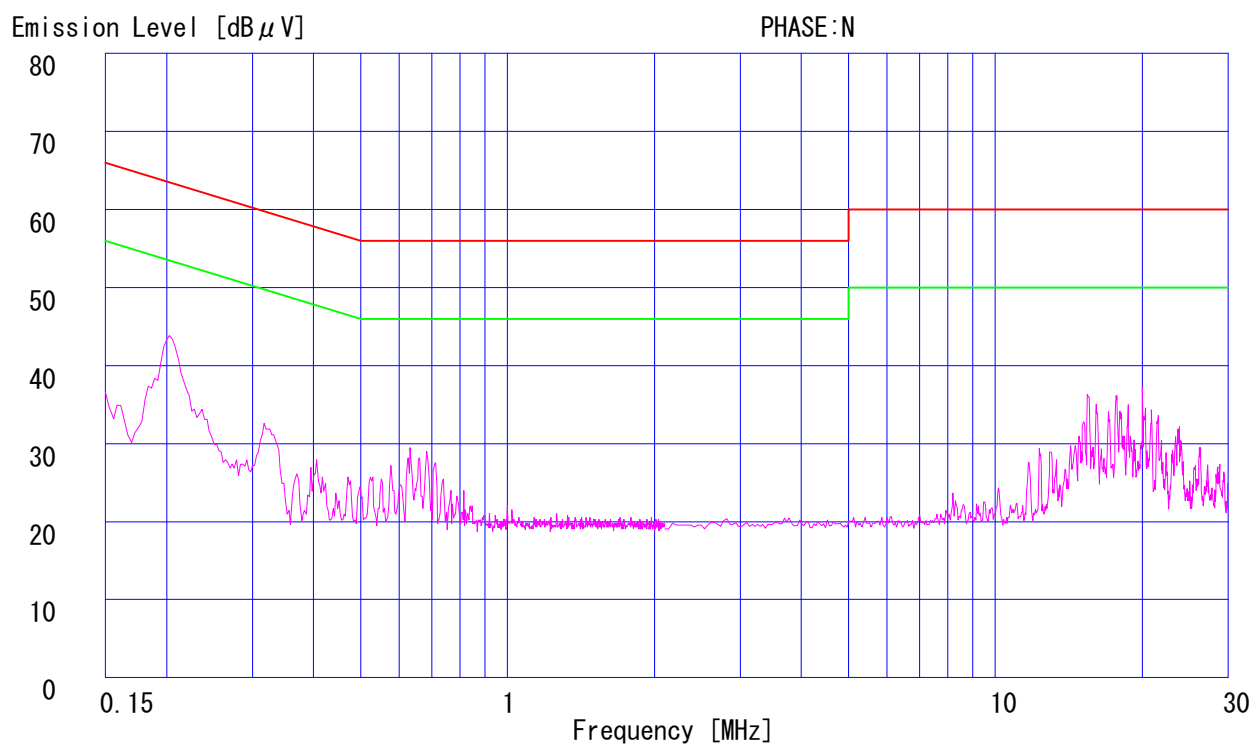
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 271E0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5260MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



Page :

DATA OF CONDUCTION TEST CHART

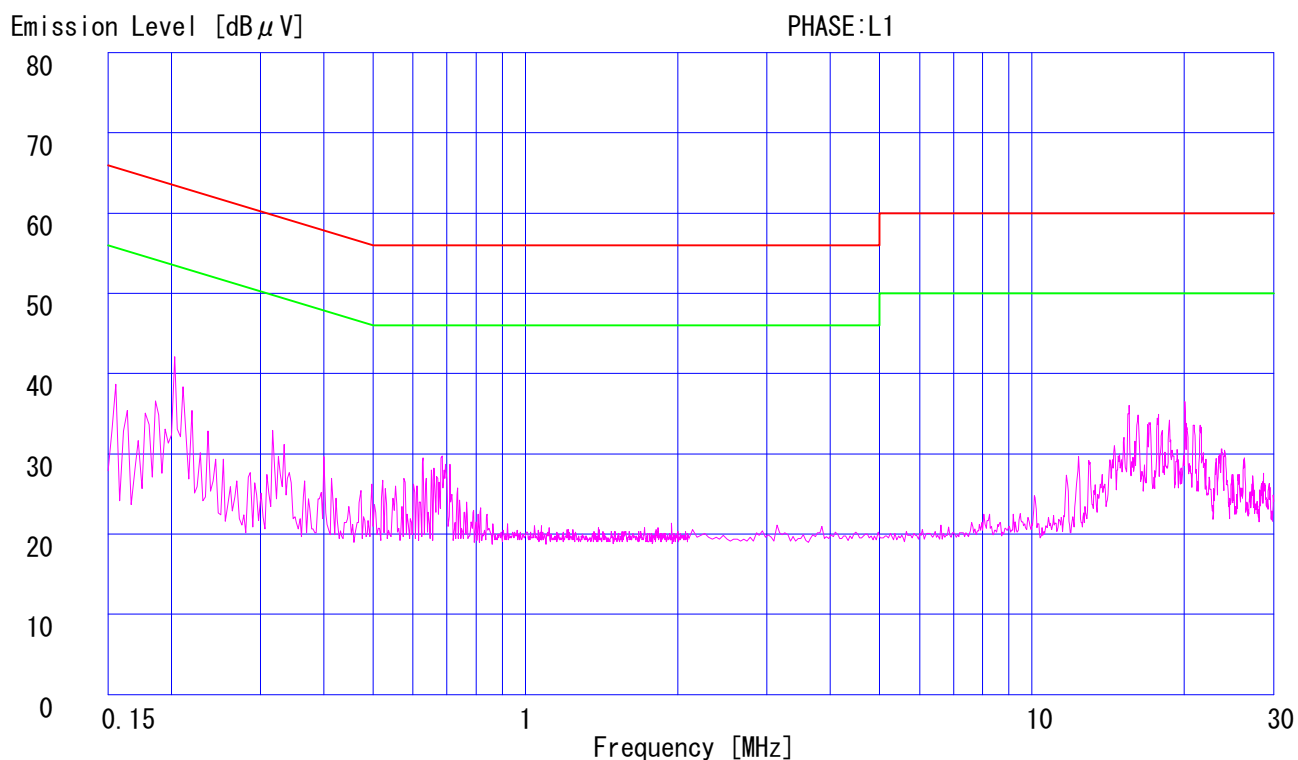
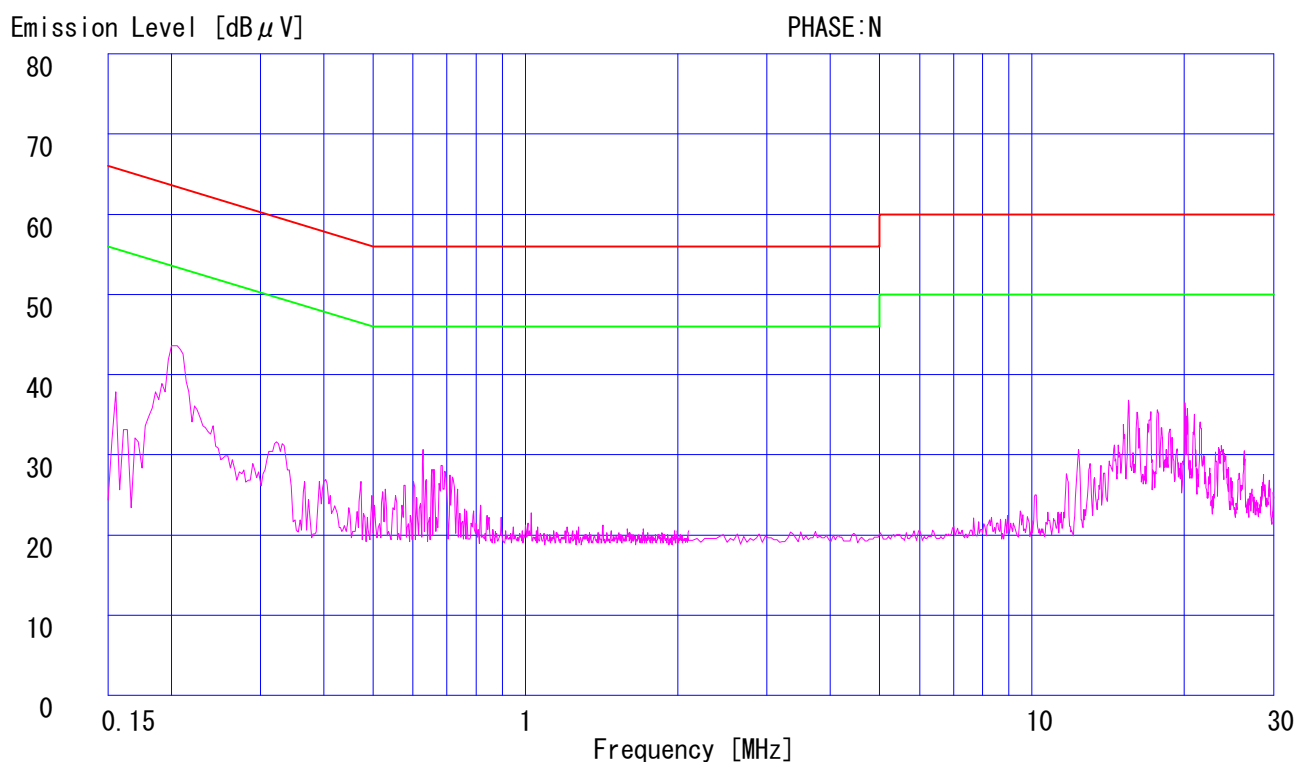
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 27IE0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Transmitting (5320MHz)
Remarks : IEEE802.11a
Date : 12/3/2007
Phase : Single Phase
Temperature : 24 °C
Humidity : 39 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

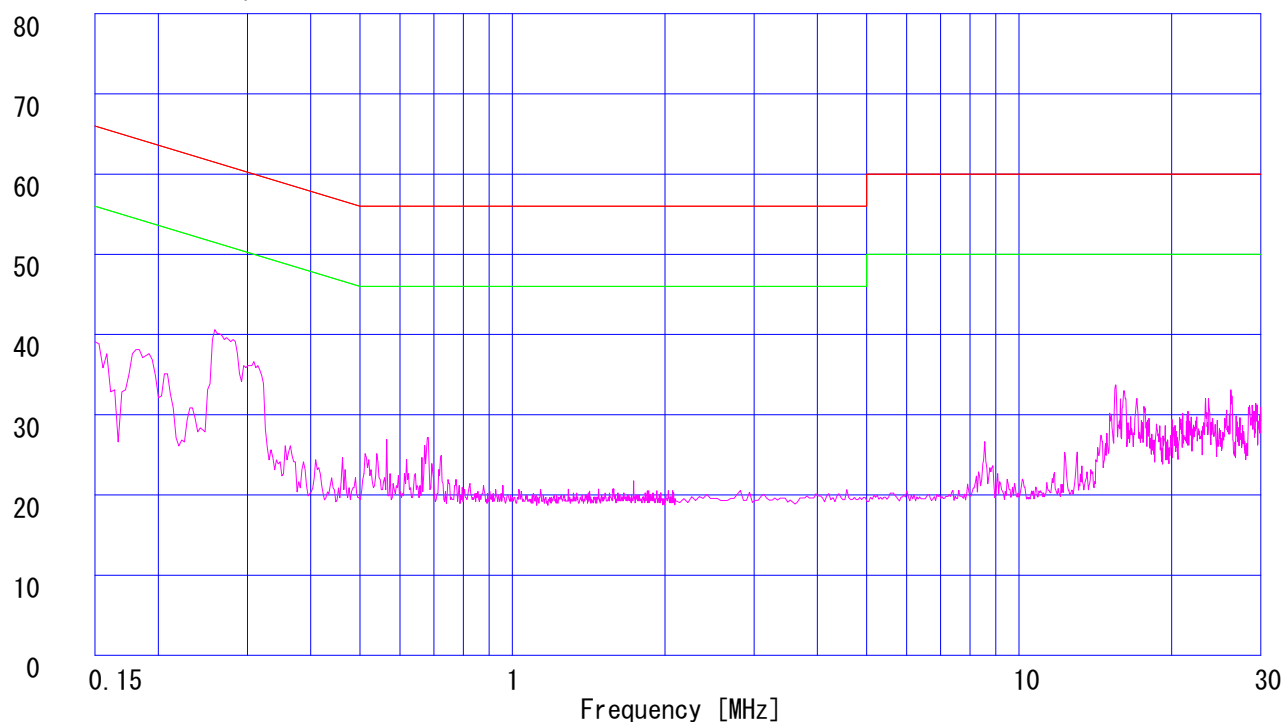
Report No. : 27IE0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
Kind of Equipment : Option(s) for Radiocommunications
Model No. : R-WL54MN
Serial No. : 704S0191
Power : AC120V/60Hz
Mode : Receiving(5260MHz)
Remarks : IEEE802.11a
Date : 5/17/2007
Phase : Single Phase
Temperature : 22 °C
Humidity : 57 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Takahiro Suzuki

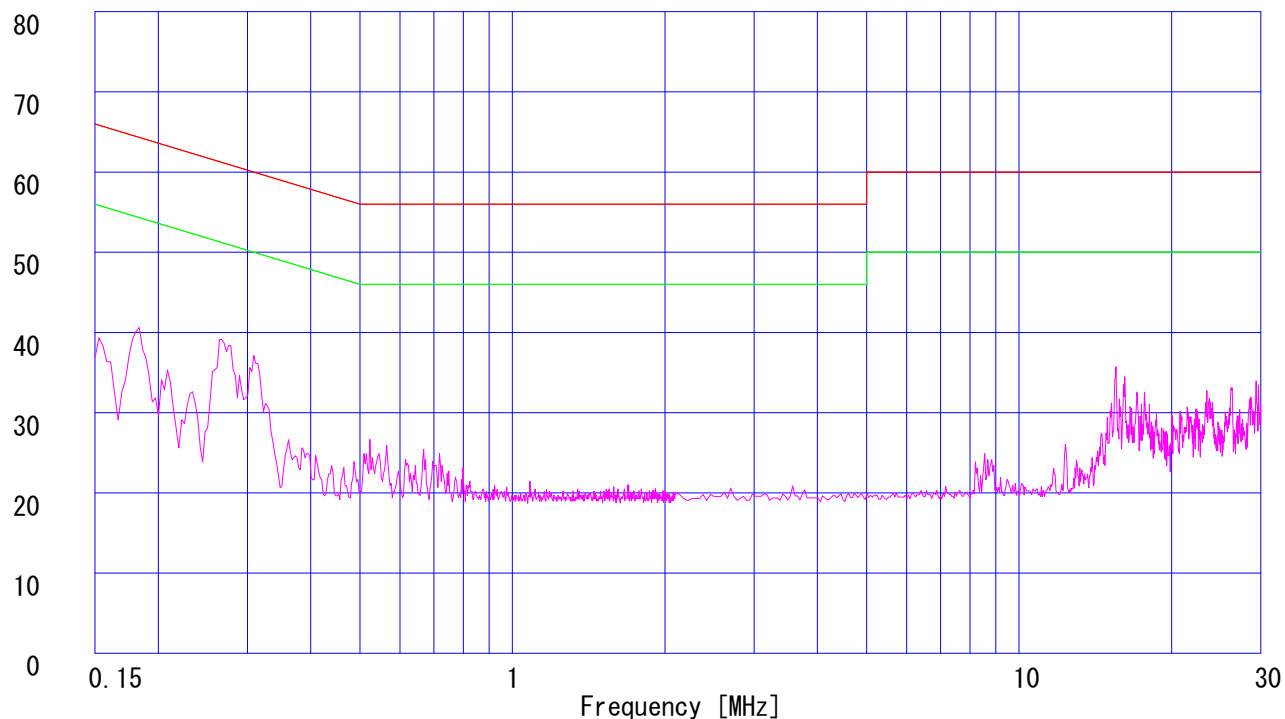
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1

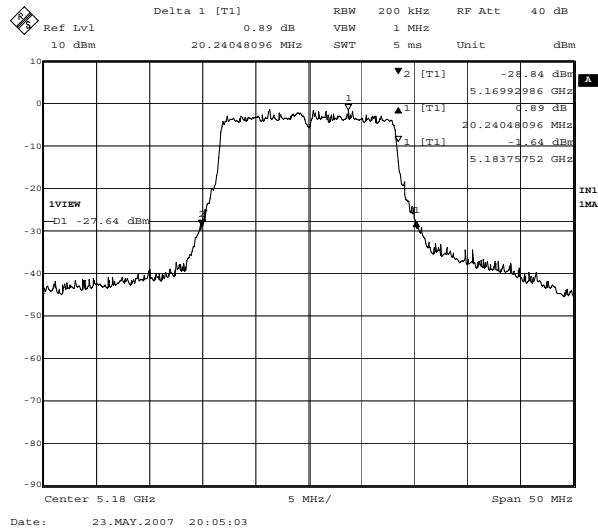


26dB Bandwidth: FCC 15.407(a)(1)(2)(3)

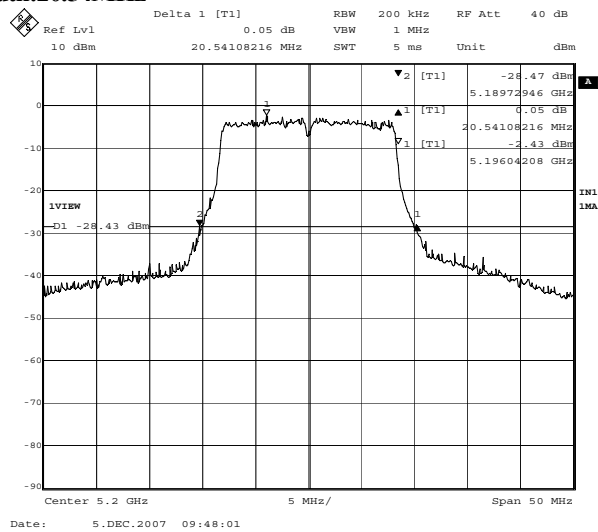
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]

UL Japan, Inc. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(a)(1)(2)(3)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

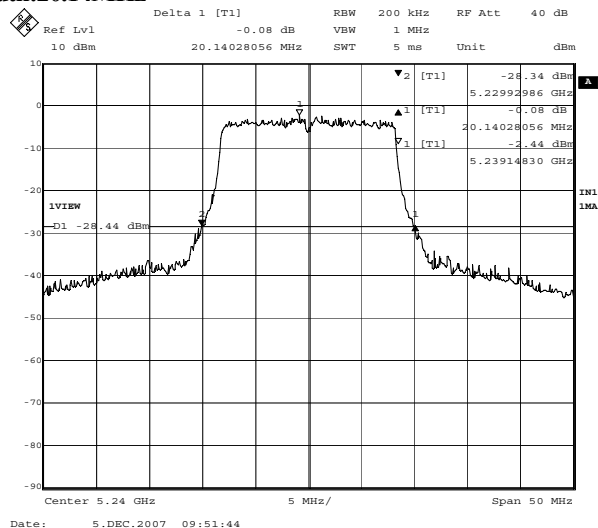
1. Ch 36: 5180MHz/26dB Bandwidth:20.24MHz



2. Ch 40: 5200MHz/26dB Bandwidth:20.54MHz



3. Ch 48: 5240MHz/26dB Bandwidth:20.14MHz

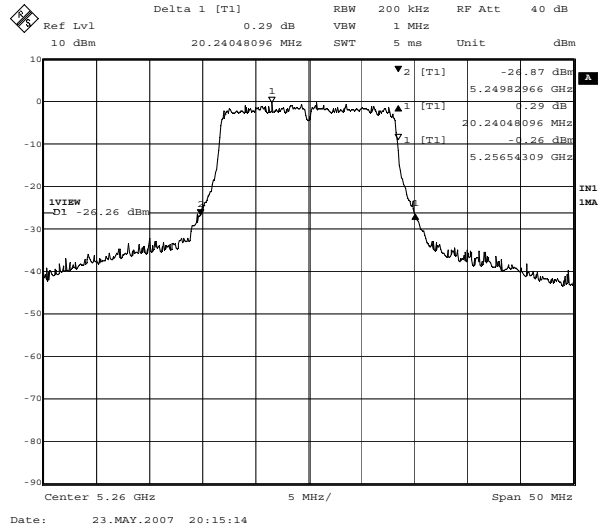


26dB Bandwidth: FCC 15.407(a)(1)(2)(3)

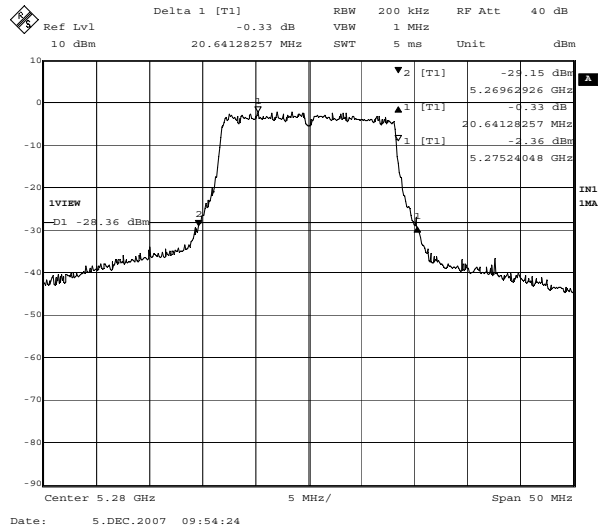
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]

UL Japan, Inc. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : FCC Section 15.407(a)(1)(2)(3)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

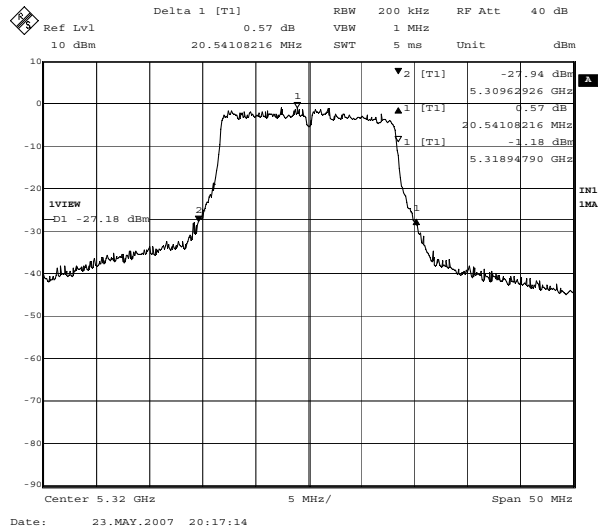
4. Ch 52: 5260MHz/26dB Bandwidth:20.24MHz



5. Ch 56: 5280MHz/26dB Bandwidth:20.64MHz



6. Ch 64: 5320MHz/26dB Bandwidth:20.54MHz



Maximum Peak Conducted Output Power

UL Japan, Inc.

YAMAKITA NO.2 Shielded Room

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBE: R-WL54MN
SERIAL NUMBE: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
TEST MODE : Transmitting

REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(a)(1)(2)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%

ENGINEER : Tatsuya Arai

IEEE802.11a(54Mbps)

Lower band (5150MHz-5250MHz)

CH	FREQ [GHz]	S/A Reading [dBm]	Cable Loss [dB]	Results [dBm]	Limit [dBm]	MARGIN [dB]
Low	5180.00	4.85	2.4	7.25	17.0	9.75
Mid	5200.00	3.87	2.4	6.27	17.0	10.73
High	5240.00	4.33	2.4	6.73	17.0	10.27

Upper band (5250MHz-5350MHz)

CH	FREQ [GHz]	S/A Reading [dBm]	Cable Loss [dB]	Results [dBm]	Limit [dBm]	MARGIN [dB]
Low	5260.00	6.06	2.4	8.46	24.0	15.54
Mid	5280.00	4.47	2.4	6.87	24.0	17.13
High	5320.00	5.22	2.4	7.62	24.0	16.38

Sample Calculation:

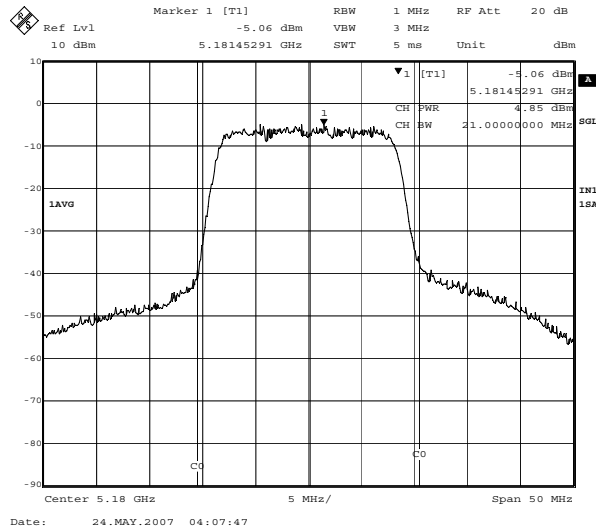
Result = Reading + Cable Loss

Maximum Peak Conducted Output Power

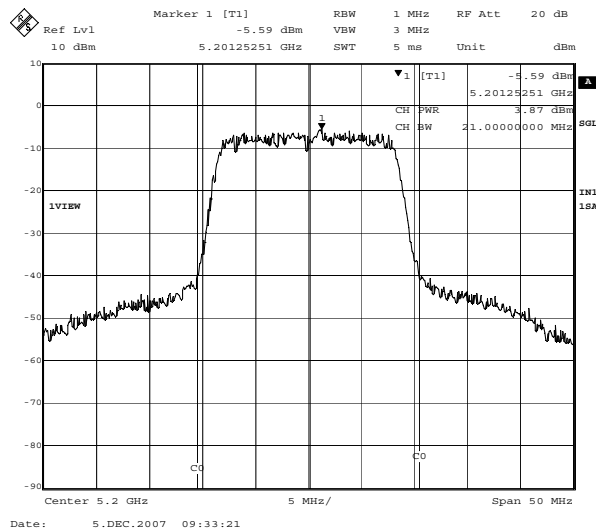
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]

UL Japan, Inc. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(a)(1)(2)(3)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

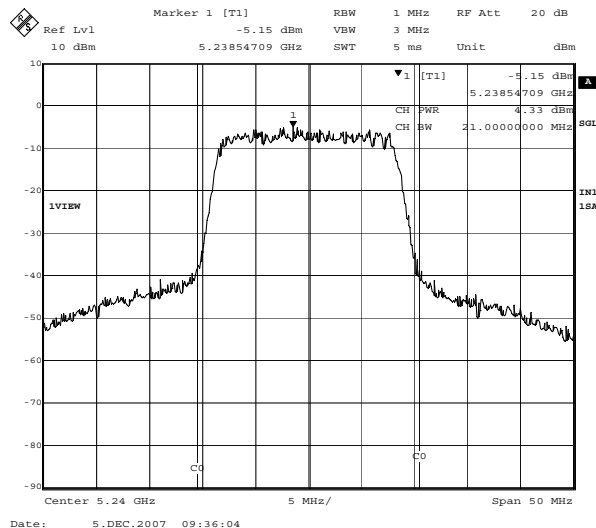
1. Ch 36: 5180MHz



2. Ch 40: 5200MHz



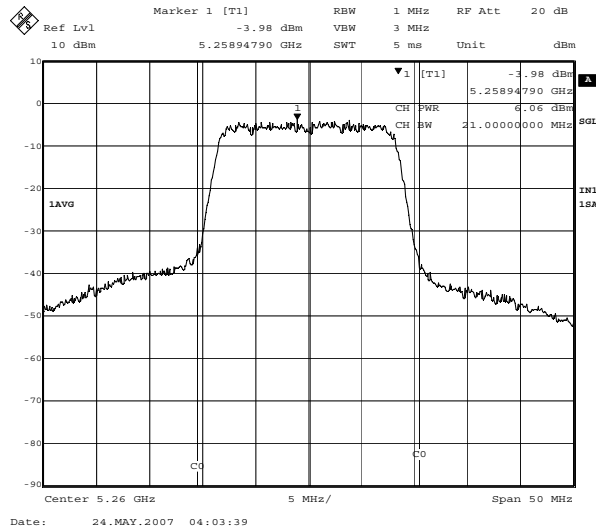
3. Ch 48: 5240MHz



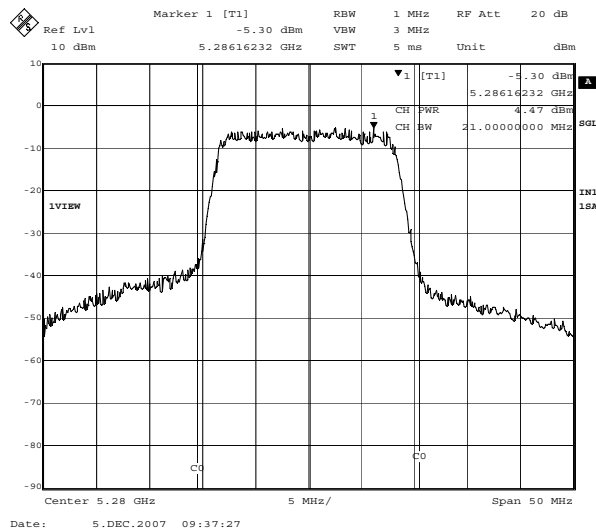
Maximum Peak Conducted Output Power

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER : R-WL54MN
SERIAL NUMBER : 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]
4. Ch 52: 5260MHz

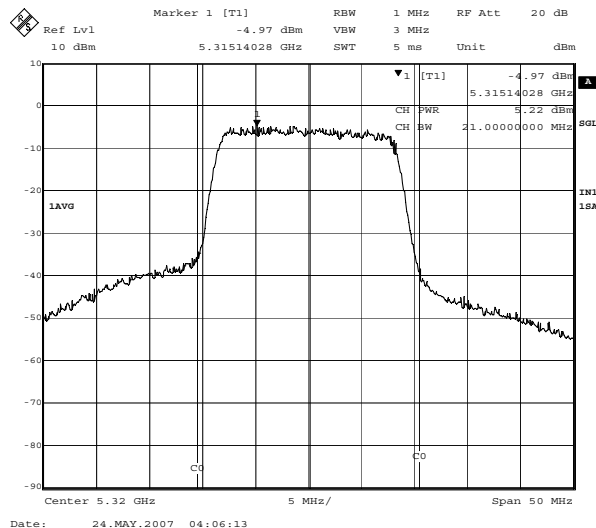
UL Japan, Inc. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(a)(1)(2)(3)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai



5. Ch 56: 5280MHz



6. Ch 64: 5320MHz



Peak Power Spectral Density (Conducted)

UL Japan, Inc.

YAMAKITA NO.2 Shielded Room

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER : R-WL54MN
SERIAL NUMBER : 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
TEST MODE : Transmitting

REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(a)(1)(2)
DATE : 2007/05/24
TEMP./HUMI : 24°C/48%

ENGINEER : Tatsuya Arai

IEEE802.11a (54Mbps)

Lower band (5150MHz-5250MHz)

CH	FREQ	S/A Reading	Cable Loss	Results	Limit	MARGIN
	[MHz]	[dBm]	[dB]	[dBm]	[dBm]	[dB]
Low	5180.00	-5.06	2.4	-2.66	4.0	6.7
Mid	5200.00	-5.59	2.4	-3.19	4.0	7.2
High	5240.00	-5.15	2.4	-2.75	4.0	6.8

Upper band (5250MHz-5350MHz)

CH	FREQ	S/A Reading	Cable Loss	Results	Limit	MARGIN
	[MHz]	[dBm]	[dB]	[dBm]	[dBm]	[dB]
Low	5260.00	-3.98	2.4	-1.58	11.0	12.6
Mid	5280.00	-5.30	2.4	-2.90	11.0	13.9
High	5320.00	-4.97	2.4	-2.57	11.0	13.6

Sample Calculation:

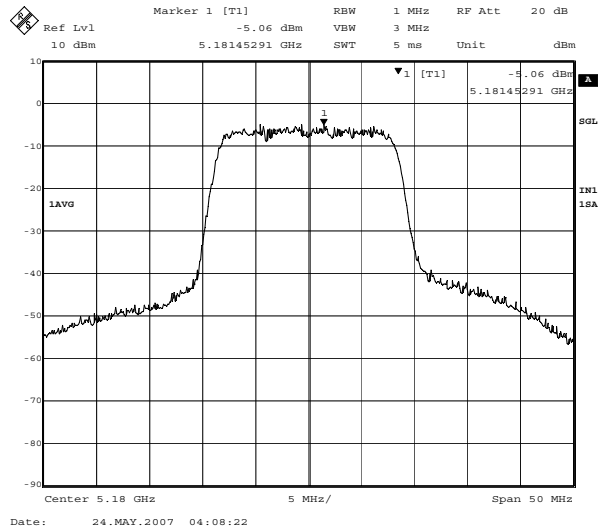
Result = Reading + Cable Loss

Maximum Peak Conducted Output Power: FCC 15.407(a)(1)(2)

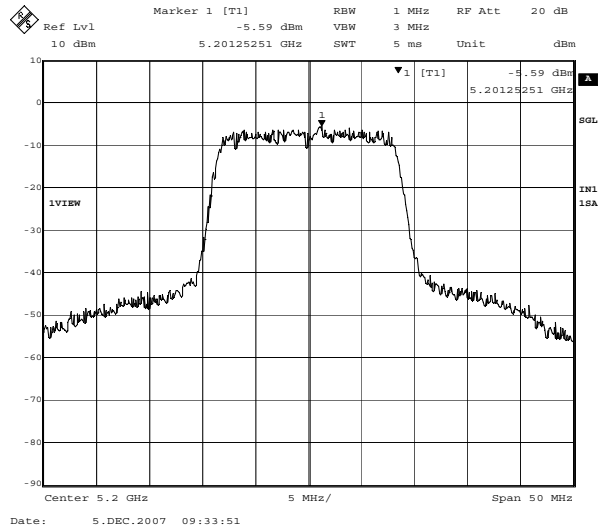
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]

UL Japan. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 407(a)(1)(2)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

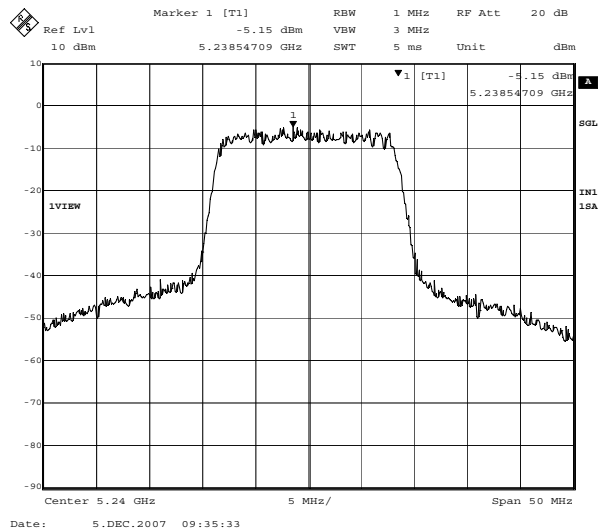
1. Ch 36: 5180MHz



2. Ch 40: 5200MHz



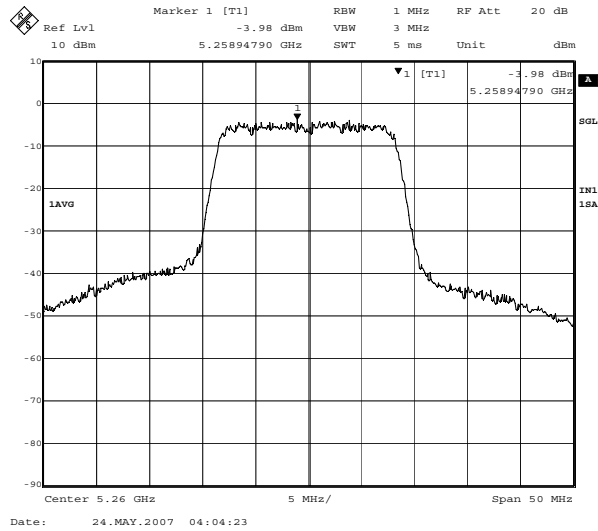
3. Ch 48: 5240MHz



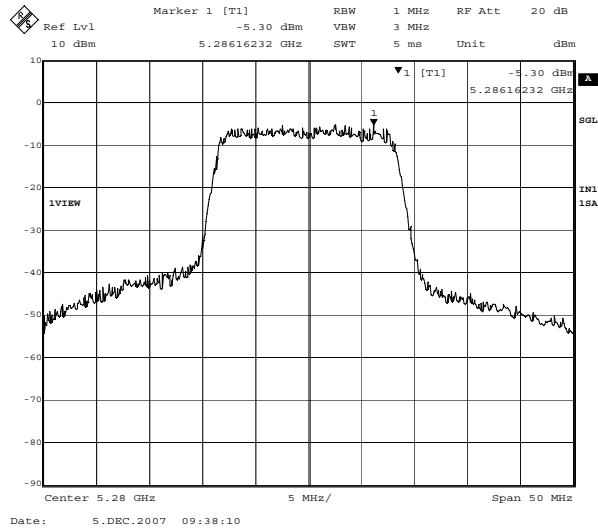
Maximum Peak Conducted Output Power: FCC 15.407(a)(1)(2)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]
4. Ch 52: 5260MHz

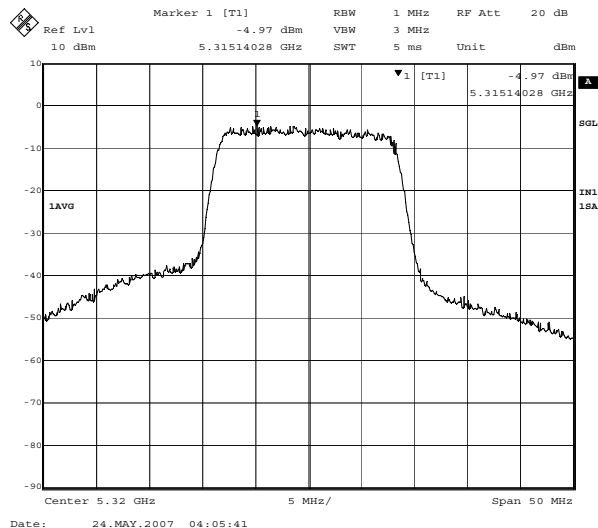
UL Japan. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 407(a)(1)(2)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai



5. Ch 56: 5280MHz



6. Ch 64: 5320MHz

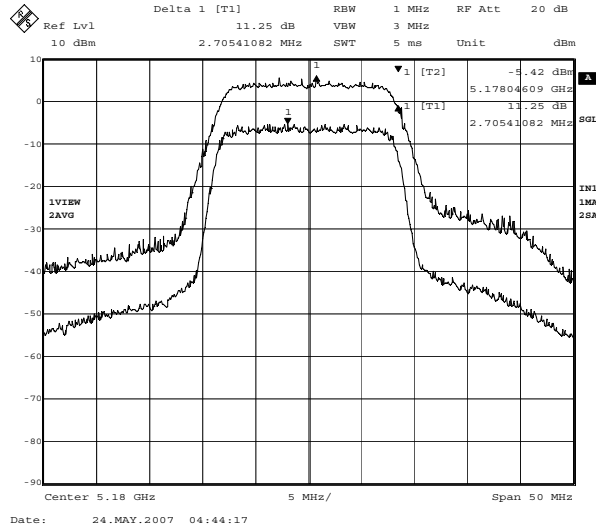


Peak Excursion Ratio: FCC 15.407(a)(6)

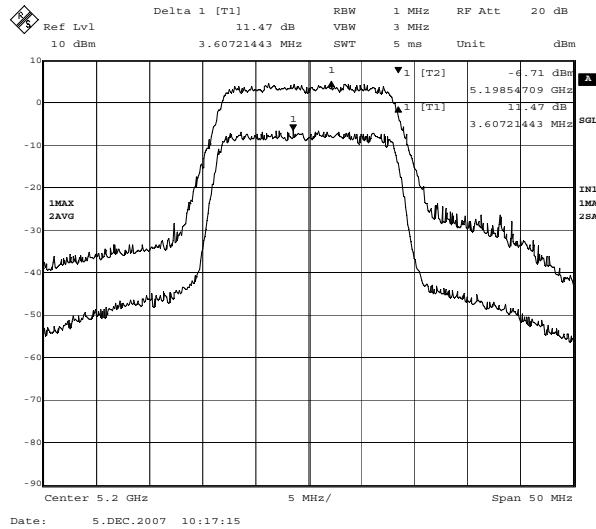
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]

UL Japan. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(a)(6)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

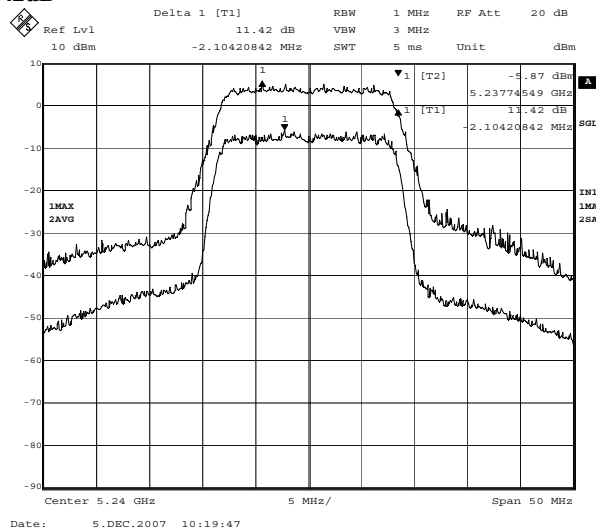
1. Ch 36: 5180MHz/Excursion:11.25dB



2. Ch 40: 5200MHz/ Excursion:11.47dB



3. Ch 48: 5240MHz/ Excursion:11.42dB

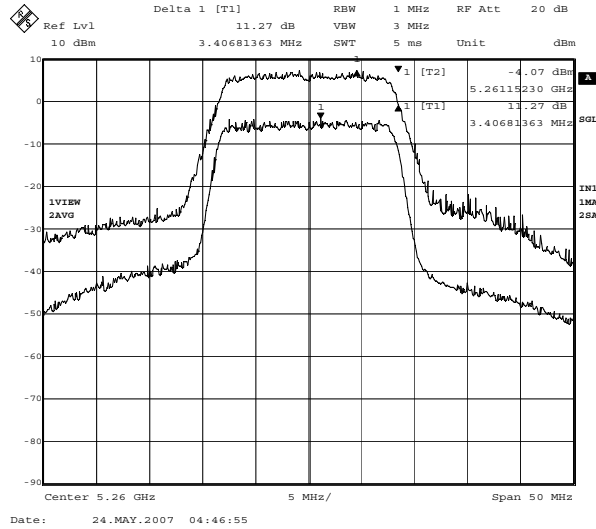


Peak Excursion Ratio: FCC 15.407(a)(6)

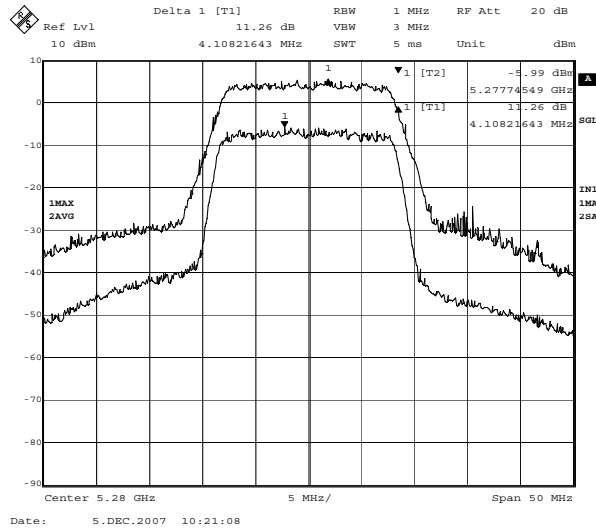
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]

UL Japan. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(a)(6)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 24°C/48%, 25°C/41%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

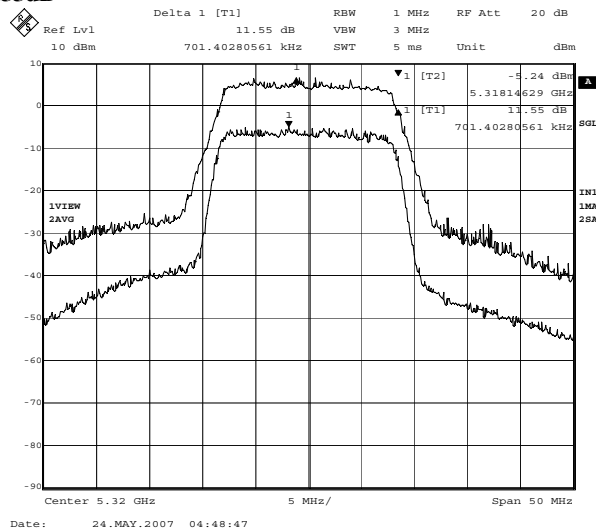
4. Ch 52: 5260MHz/Excursion:11.27dB



5. Ch 56: 5280MHz/ Excursion:11.26dB



6. Ch 64: 5320MHz/ Excursion:11.55dB



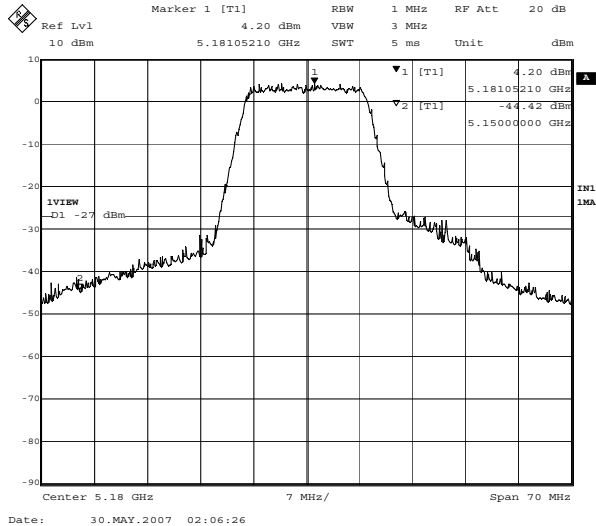
Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz

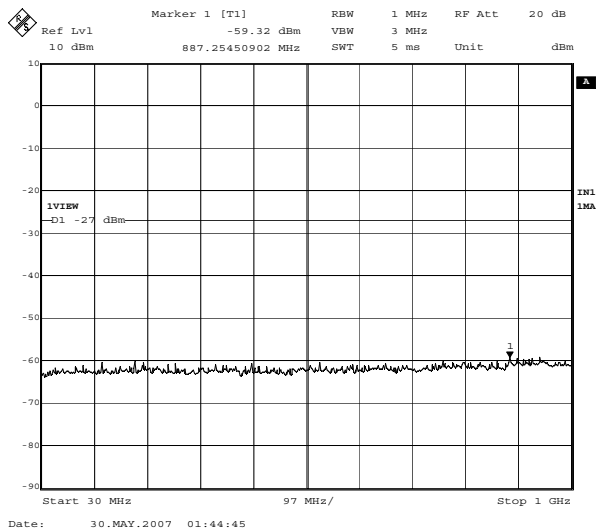
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

[IEEE802.11a(54Mbps)]
Transmitting Ch36: 5180MHz

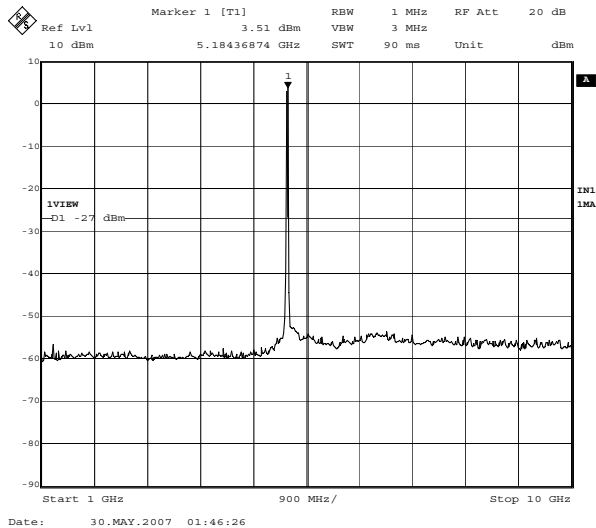
1.



2.



3.

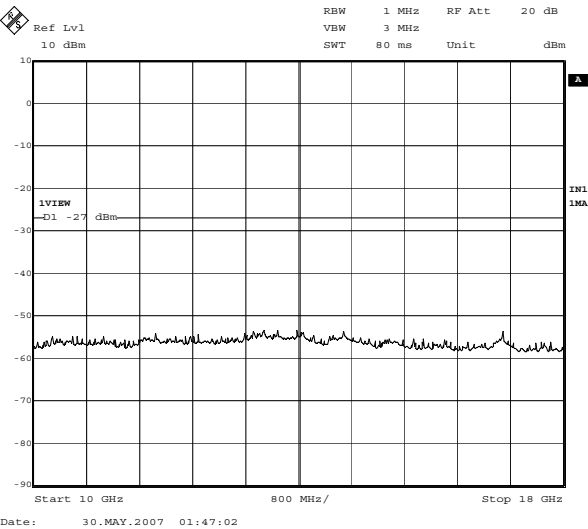


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

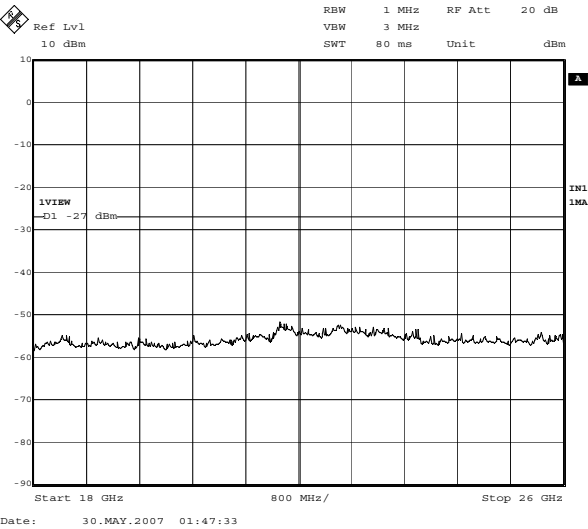
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a(54Mbps)]
Transmitting Ch36: 5180MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode :Transmitting/Receiving
ENGINEER : Tatsuya Arai

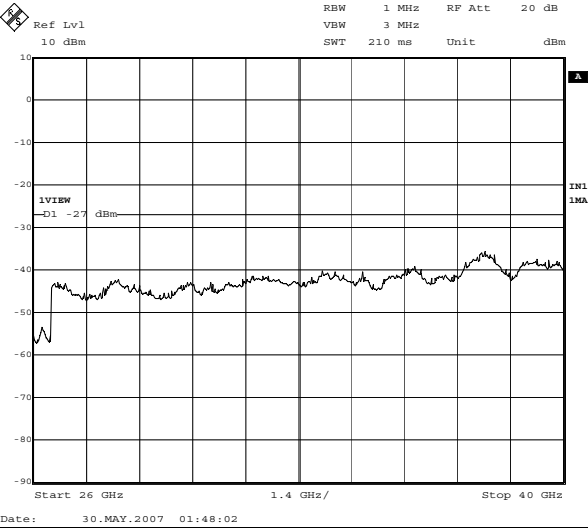
4.



5.



6.



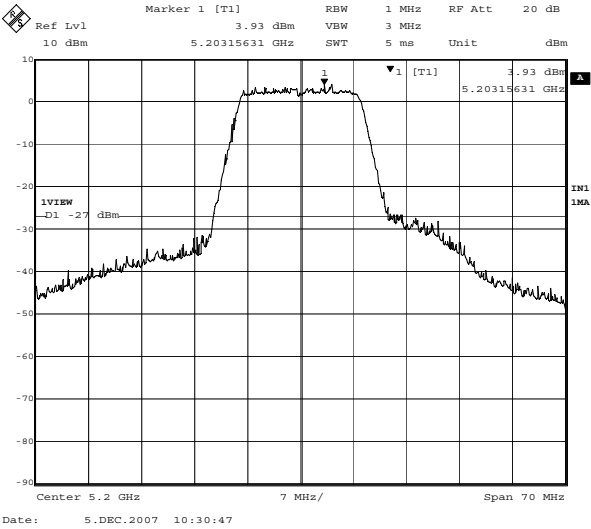
Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz

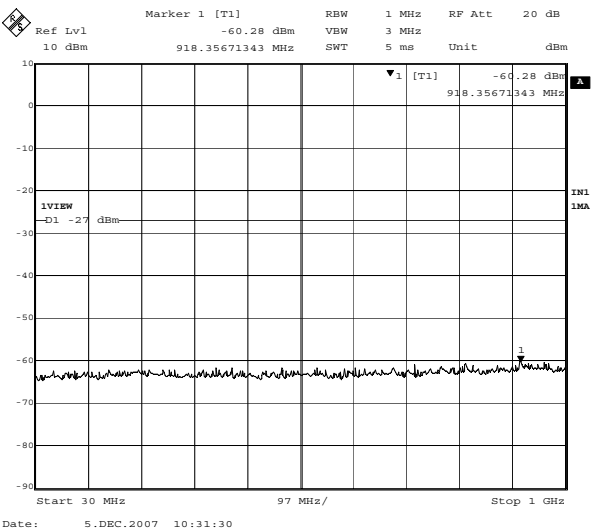
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

[IEEE802.11a(54Mbps)]
Transmitting Ch40: 5200MHz

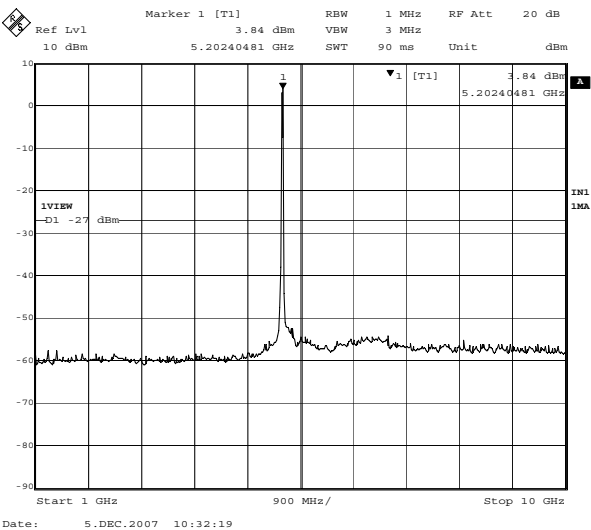
1.



2.



3.

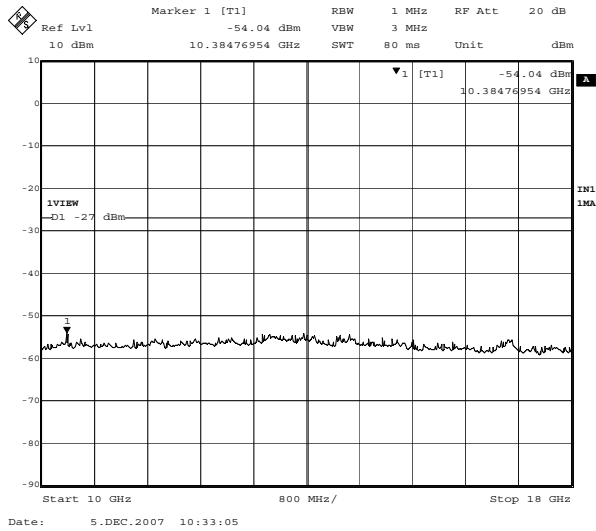


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

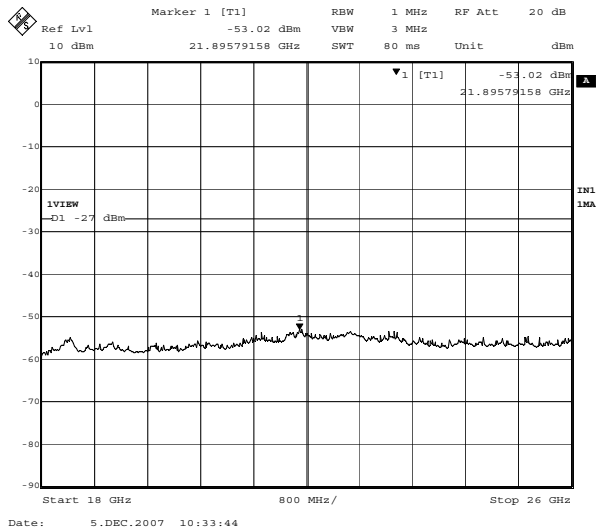
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a(54Mbps)]
Transmitting Ch40: 5200MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

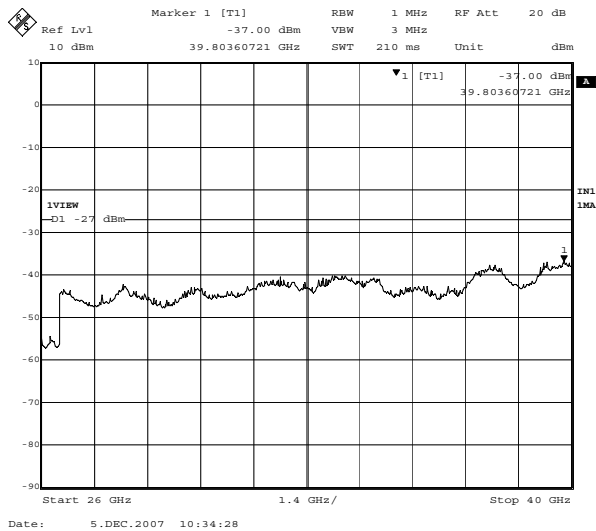
4.



5.



6.



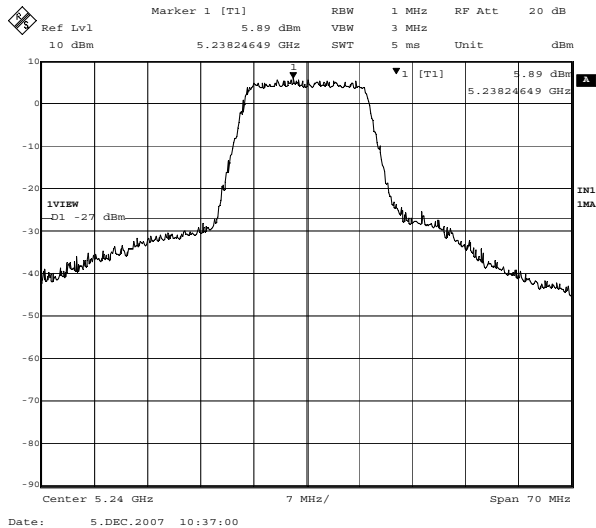
Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz

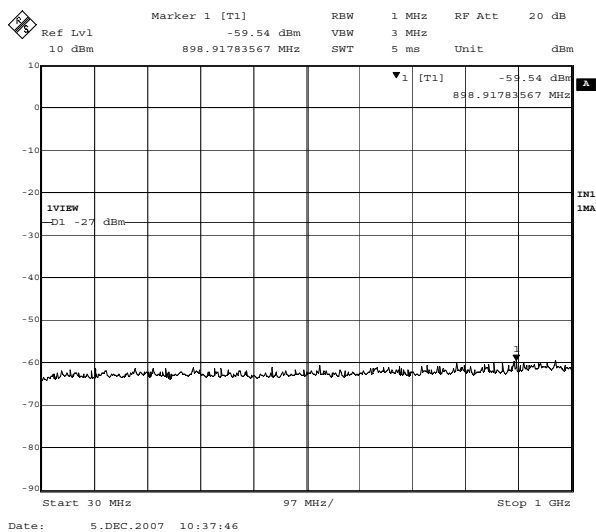
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C/41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

[IEEE802.11a(54Mbps)]
Transmitting Ch48: 5240MHz

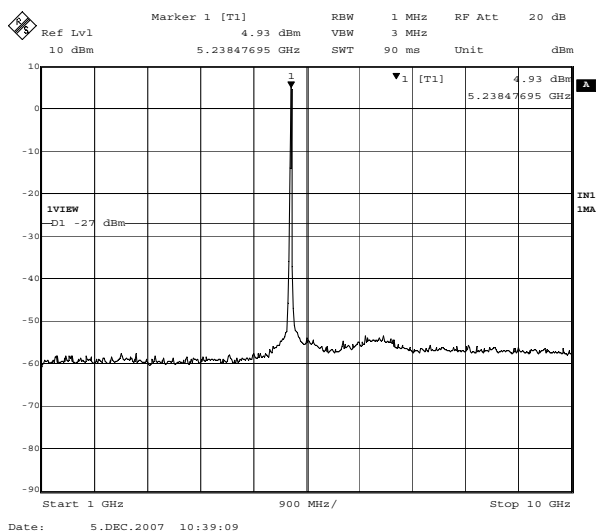
1.



2.



3.

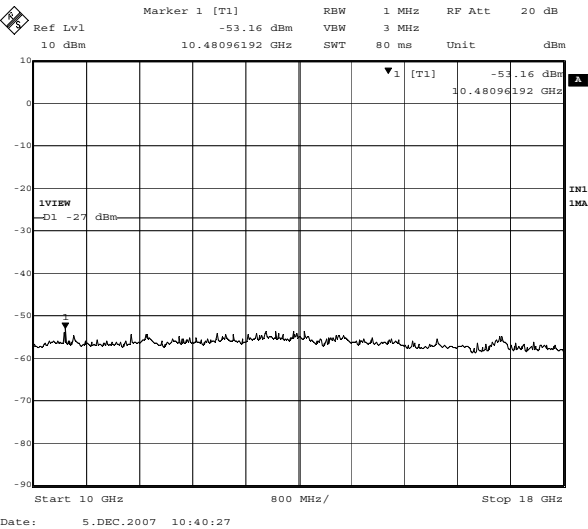


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

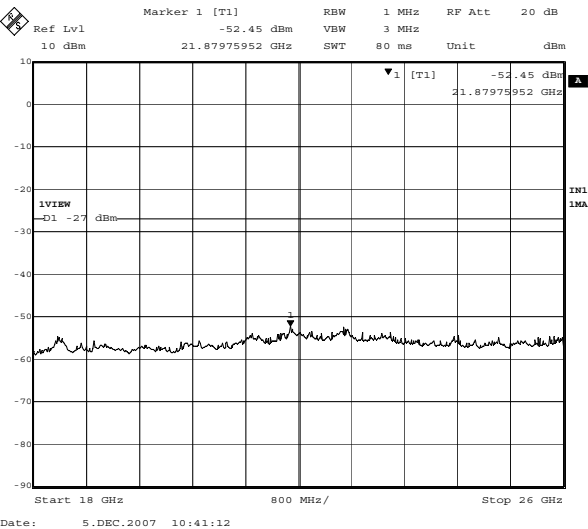
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a(54Mbps)]
Transmitting Ch48: 5240MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

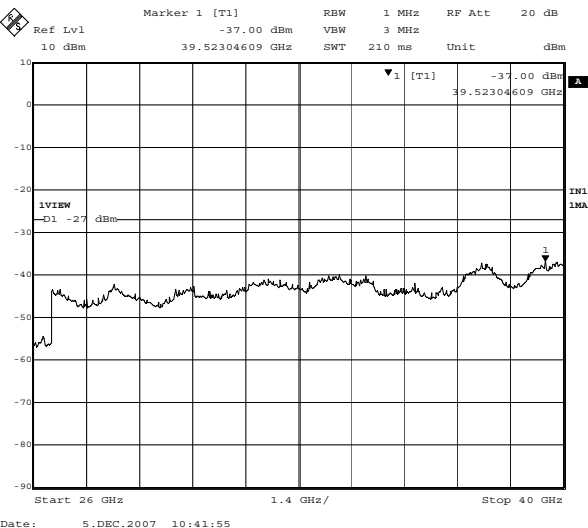
4.



5.



6.



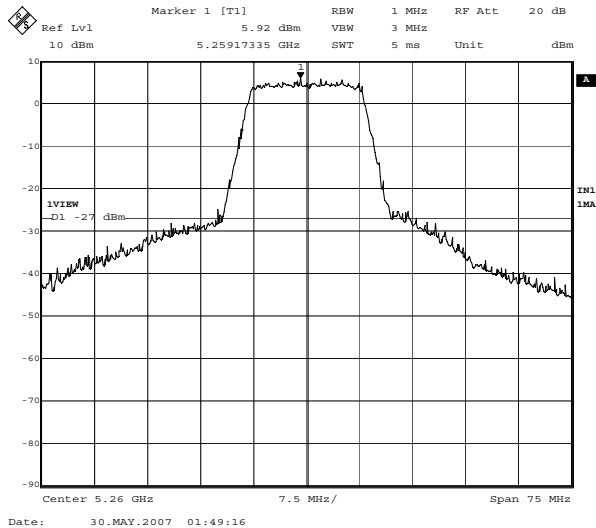
Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz

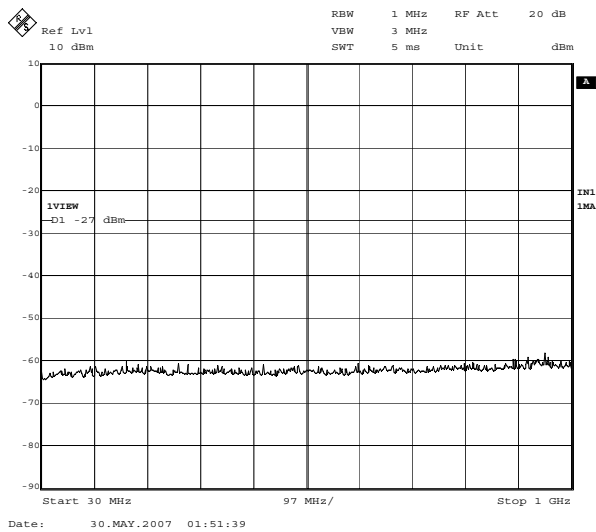
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

[IEEE802.11a(54Mbps)]
Transmitting Ch52: 5260MHz

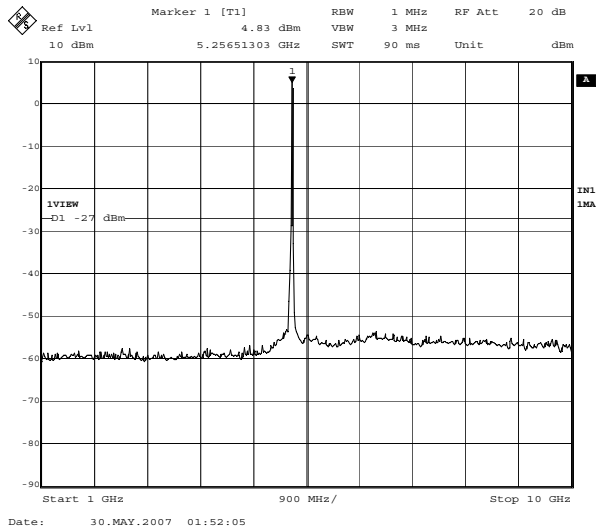
1.



2.



3.

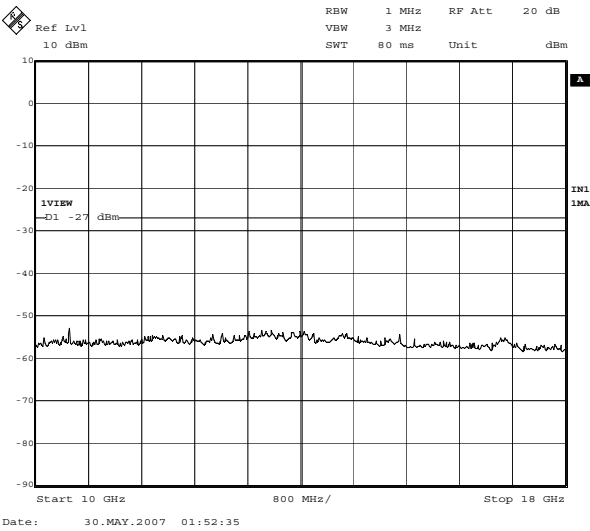


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

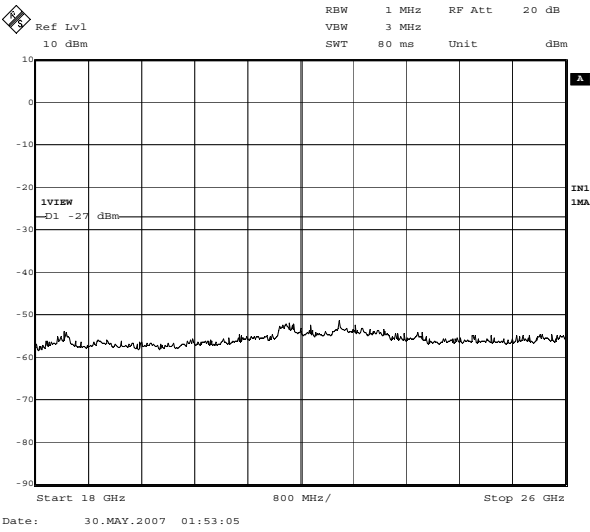
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a(54Mbps)]
Transmitting Ch52: 5260MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

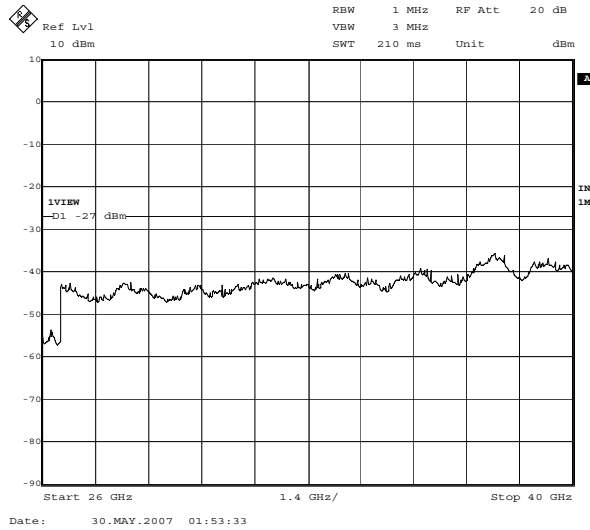
4.



5.



6.



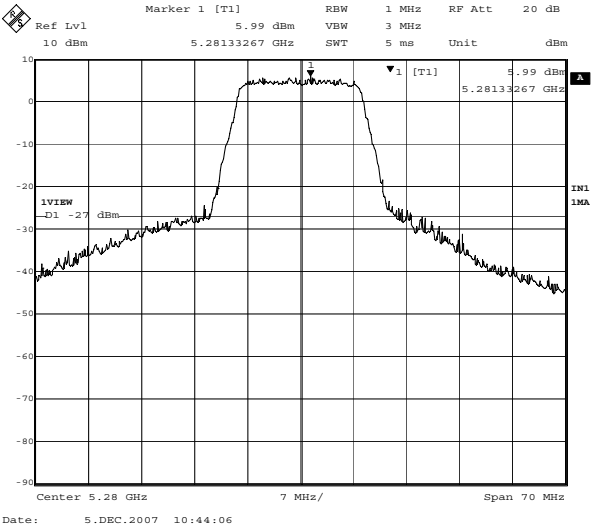
Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz

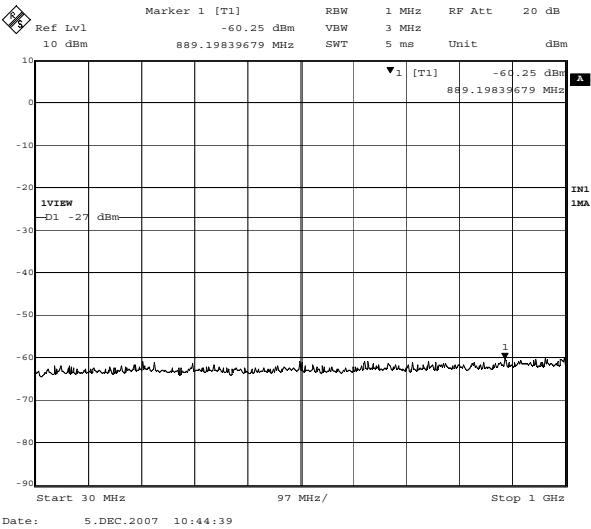
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

[IEEE802.11a(54Mbps)]
Transmitting Ch56: 5280MHz

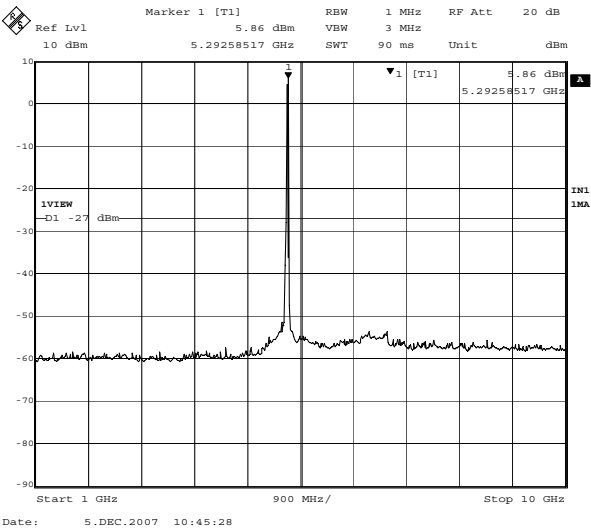
1.



2.



3.

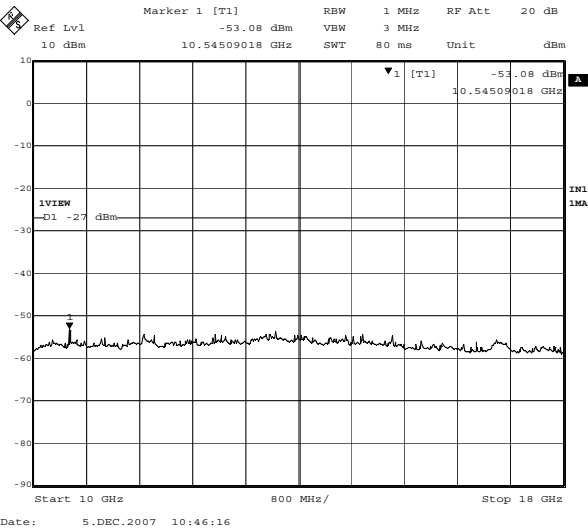


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

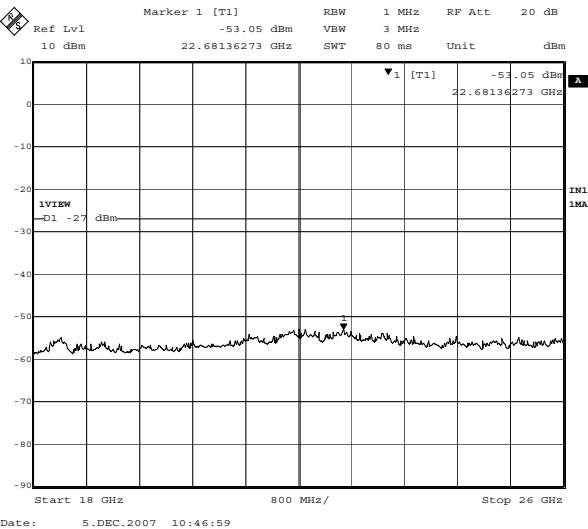
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a(54Mbps)]
Transmitting Ch56: 5280MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

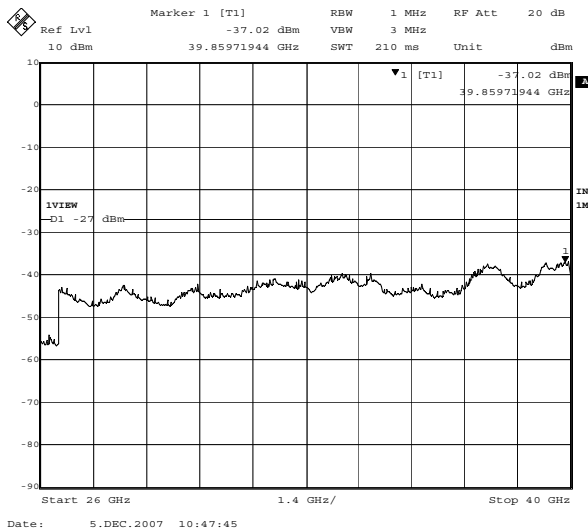
4.



5.



6.



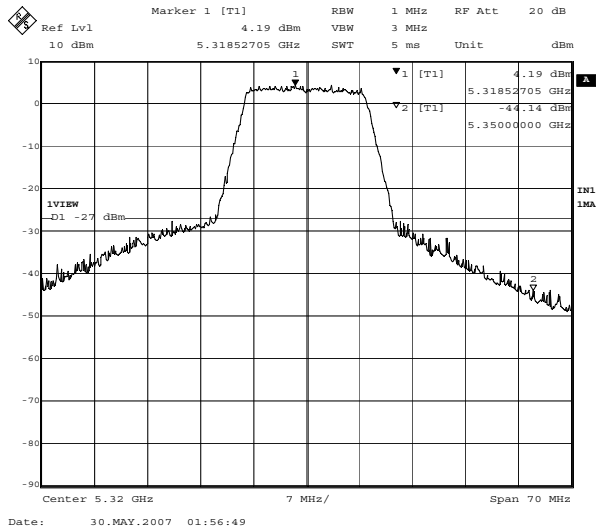
Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz

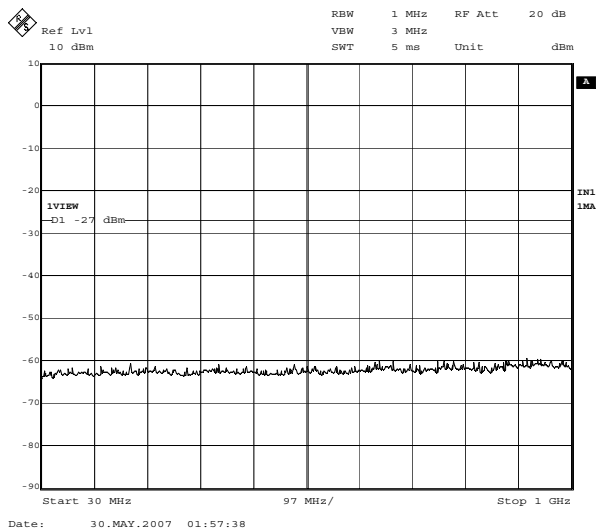
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

[IEEE802.11a(54Mbps)]
Transmitting Ch64: 5320MHz

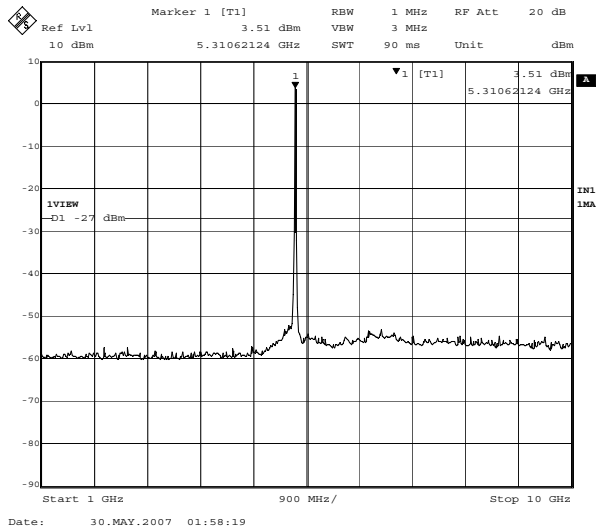
1.



2.



3.

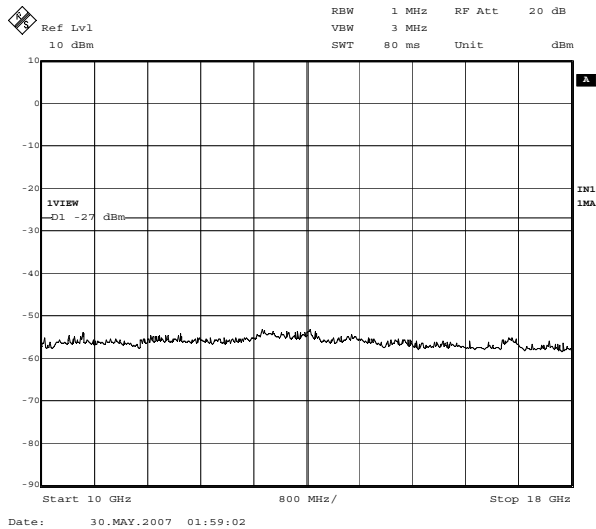


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

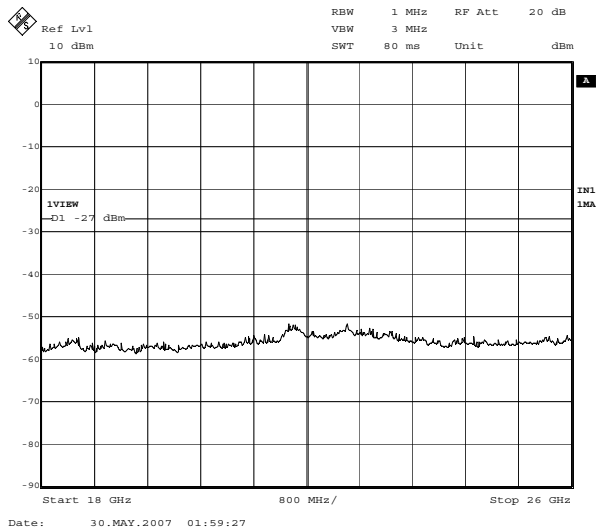
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a(54Mbps)]
Transmitting Ch64: 5320MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

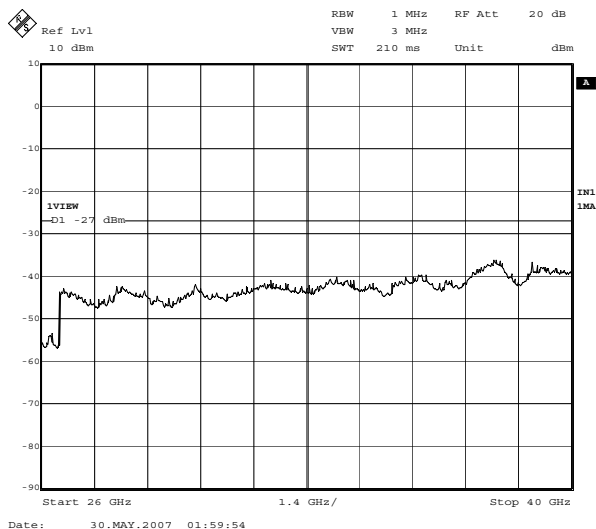
4.



5.



6.



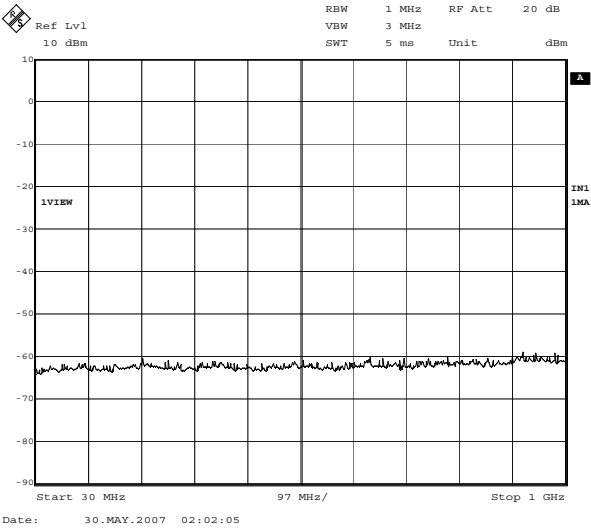
Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz

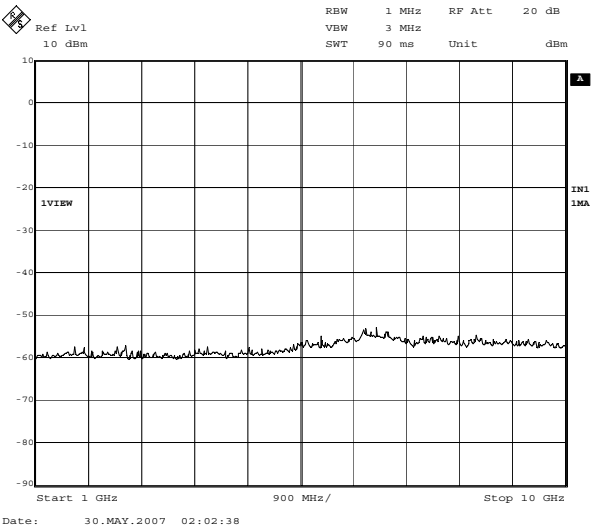
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

[IEEE802.11g(54Mbps)]
Receiving (Ant1) Ch52: 5260MHz

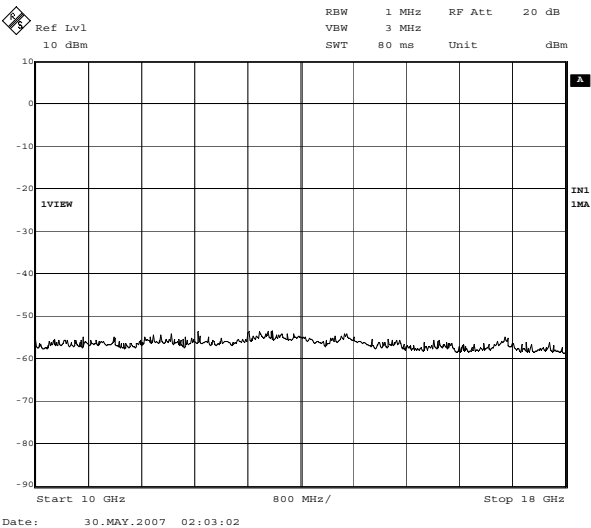
1.



2.



3.

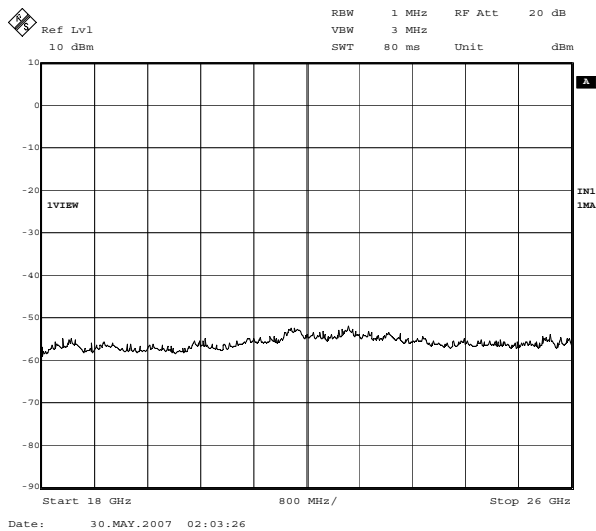


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

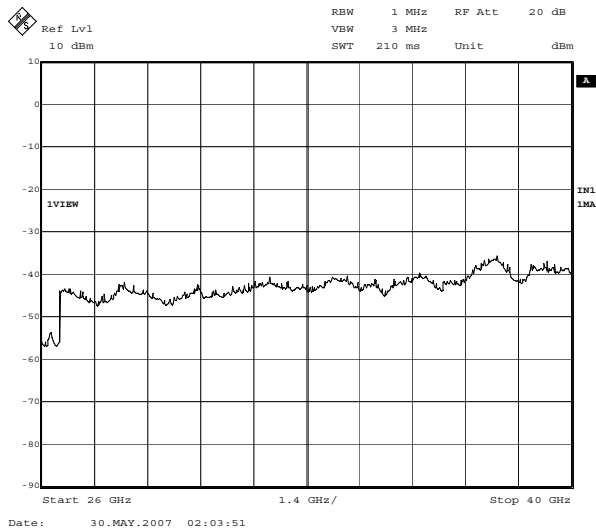
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11g(54Mbps)]
Receiving (Ant1) Ch52: 5260MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

4.



5.

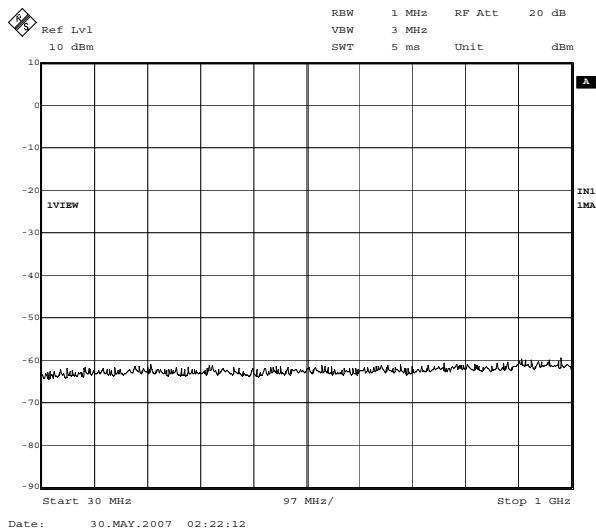


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

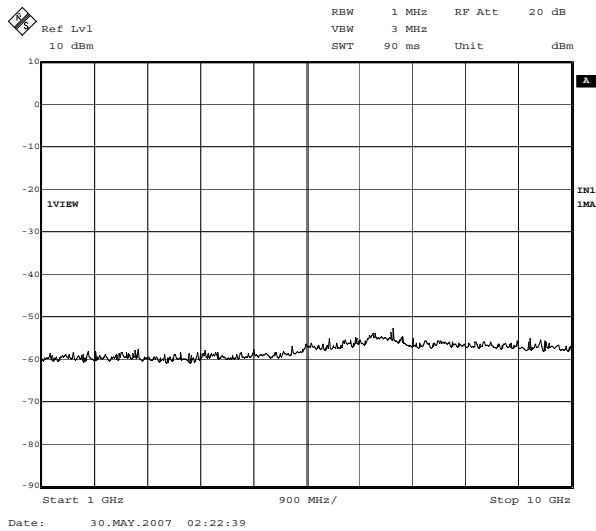
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11g(54Mbps)]
Receiving (Ant2) Ch52: 5260MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

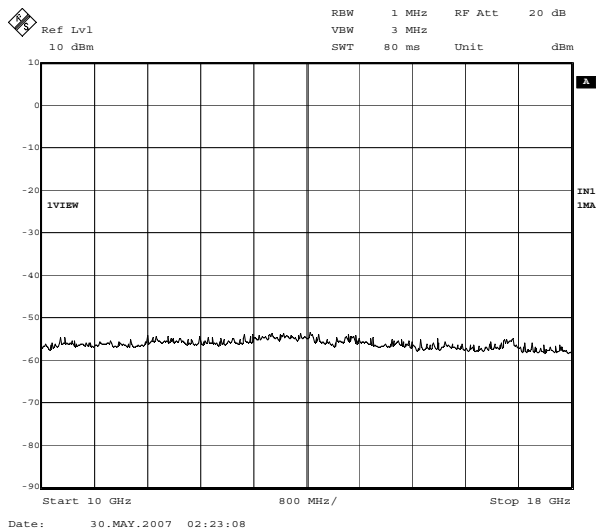
1.



2.



3.

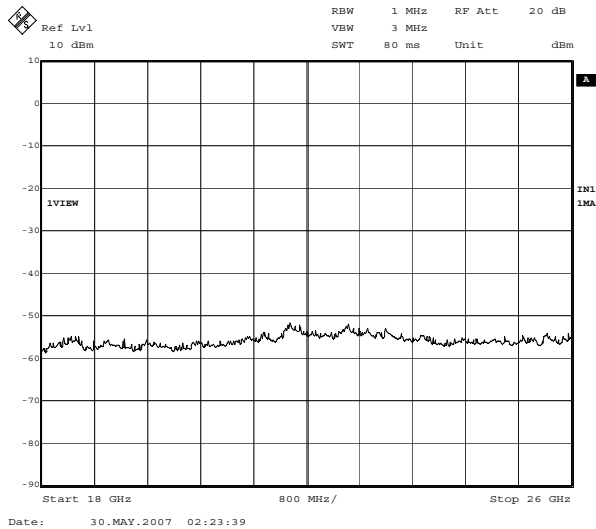


Out of Band Emission(Antenna Terminal Conducted): FCC 15.407(b)(1)(2)(5)(7)

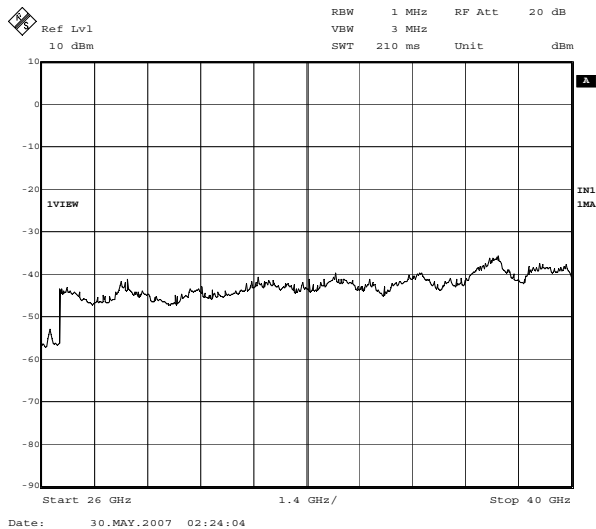
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11g(54Mbps)]
Receiving (Ant2) Ch52: 5260MHz

UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 27IE0337-YK-B-R1
REGULATION : Fcc Section 15.407(b)(1)(2)(5)(7)
DATE : 2007/05/24, 2007/12/5
TEMP./HUMI : 25deg.C./41%
Test Mode : Transmitting/Receiving
ENGINEER : Tatsuya Arai

4.



5.



DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 271E0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
 Kind of Equipment : Option(s) for Radiocommunications
 Model No. : R-WL54MN
 Serial No. : 704S0191
 Power : AC120V/60Hz
 Mode : Transmitting (5180MHz)
 Remarks : IEEE802.11a
 Date : 5/15/2007
 Test Distance : 3 m
 Temperature : 23 °C
 Humidity : 53 %
 Regulation : FCC Part15C § 15.209

Engineer : Takahiro Suzuki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	80.00	BB	44.3	46.3	6.6	28.6	1.8	5.8	29.9	31.9	40.0	10.1	8.1
2.	148.66	BB	46.6	43.2	14.8	28.3	2.5	5.8	41.4	38.0	43.5	2.1	5.5
3.	180.00	BB	41.4	30.5	16.5	28.1	2.8	5.8	38.4	27.5	43.5	5.1	16.0
4.	200.00	BB	33.8	28.4	16.9	27.9	2.9	5.8	31.5	26.1	43.5	12.0	17.4
5.	240.00	BB	38.7	29.0	17.5	27.7	3.3	5.8	37.6	27.9	46.0	8.4	18.1
6.	320.00	BB	45.9	37.3	14.8	27.6	3.9	5.9	42.9	34.3	46.0	3.1	11.7
7.	360.00	BB	36.7	31.3	15.9	28.0	4.3	5.9	34.8	29.4	46.0	11.2	16.6
8.	600.00	BB	34.8	31.8	19.8	29.2	5.5	5.9	36.8	33.8	46.0	9.2	12.2
9.	840.00	BB	28.2	25.9	21.5	28.9	6.5	5.9	33.2	30.9	46.0	12.8	15.1

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz / KLA-03 (USLP9143) 300-1000MHz
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

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DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 271E0337-YK-B-R1

Applicant	: RICOH COMPANY, LTD.		
Kind of Equipment	: Option(s) for Radiocommunications		
Model No.	: R-WL54MN		
Serial No.	: 704S0191		
Power	: AC120V/60Hz		
Mode	: Transmitting(5200MHz)		
Remarks	: IEEE802.11a		
Date	: 12/3/2007		
Test Distance	: 3 m		
Temperature	: 24 °C	Engineer	: Tatsuya Arai
Humidity	: 38 %		
Regulation	: FCC Part15C § 15.209		

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	80.02	BB	42.2	34.0	6.6	28.6	1.8	5.8	27.8	19.6	40.0	12.2	20.4
2.	148.66	BB	43.3	38.4	14.8	28.3	2.6	5.8	38.2	33.3	43.5	5.3	10.2
3.	160.01	BB	44.0	35.0	15.3	28.2	2.7	5.8	39.6	30.6	43.5	3.9	12.9
4.	180.02	BB	42.7	32.9	16.5	28.1	2.8	5.8	39.7	29.9	43.5	3.8	13.6
5.	240.03	BB	40.4	30.9	17.5	27.7	3.3	5.8	39.3	29.8	46.0	6.7	16.2
6.	320.07	BB	37.4	33.7	14.8	27.6	4.1	5.9	34.6	30.9	46.0	11.4	15.1
7.	480.01	BB	32.6	34.6	17.8	28.9	5.5	5.9	32.9	34.9	46.0	13.1	11.1
8.	600.01	BB	34.2	31.6	19.8	29.2	5.9	5.9	36.6	34.0	46.0	9.4	12.0
9.	720.02	BB	28.5	24.2	20.3	29.1	6.4	5.9	32.0	27.7	46.0	14.0	18.3

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 271E0337-YK-B-R1

Applicant	: RICOH COMPANY, LTD.		
Kind of Equipment	: Option(s) for Radiocommunications		
Model No.	: R-WL54MN		
Serial No.	: 704S0191		
Power	: AC120V/60Hz		
Mode	: Transmitting(5240MHz)		
Remarks	: IEEE802.11a		
Date	: 12/3/2007		
Test Distance	: 3 m		
Temperature	: 24 °C	Engineer	: Tatsuya Arai
Humidity	: 38 %		
Regulation	: FCC Part15C § 15.209		

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	80.01	BB	42.1	34.3	6.6	28.6	1.8	5.8	27.7	19.9	40.0	12.3	20.1
2.	148.66	BB	44.1	39.1	14.8	28.3	2.6	5.8	39.0	34.0	43.5	4.5	9.5
3.	160.03	BB	44.0	34.9	15.3	28.2	2.7	5.8	39.6	30.5	43.5	3.9	13.0
4.	180.01	BB	42.5	32.1	16.5	28.1	2.8	5.8	39.5	29.1	43.5	4.0	14.4
5.	240.03	BB	40.3	30.8	17.5	27.7	3.3	5.8	39.2	29.7	46.0	6.8	16.3
6.	320.06	BB	37.4	33.6	14.8	27.6	4.1	5.9	34.6	30.8	46.0	11.4	15.2
7.	480.01	BB	32.7	35.0	17.8	28.9	5.5	5.9	33.0	35.3	46.0	13.0	10.7
8.	600.01	BB	34.4	31.8	19.8	29.2	5.9	5.9	36.8	34.2	46.0	9.2	11.8
9.	720.02	BB	28.4	24.6	20.3	29.1	6.4	5.9	31.9	28.1	46.0	14.1	17.9

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 271E0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
 Kind of Equipment : Option(s) for Radiocommunications
 Model No. : R-WL54MN
 Serial No. : 704S0191
 Power : AC120V/60Hz
 Mode : Transmitting (5260MHz)
 Remarks : IEEE802.11a
 Date : 5/15/2007
 Test Distance : 3 m
 Temperature : 23 °C
 Humidity : 53 %
 Regulation : FCC Part15C § 15.209

Engineer : Takahiro Suzuki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	80.00	BB	44.9	46.2	6.6	28.6	1.8	5.8	30.5	31.8	40.0	9.5	8.2
2.	148.66	BB	46.7	43.1	14.8	28.3	2.5	5.8	41.5	37.9	43.5	2.0	5.6
3.	180.00	BB	40.9	30.5	16.5	28.1	2.8	5.8	37.9	27.5	43.5	5.6	16.0
4.	200.00	BB	32.3	27.8	16.9	27.9	2.9	5.8	30.0	25.5	43.5	13.5	18.0
5.	240.00	BB	38.6	29.4	17.5	27.7	3.3	5.8	37.5	28.3	46.0	8.5	17.7
6.	320.00	BB	41.5	33.3	14.8	27.6	3.9	5.9	38.5	30.3	46.0	7.5	15.7
7.	360.00	BB	37.3	31.5	15.9	28.0	4.3	5.9	35.4	29.6	46.0	10.6	16.4
8.	600.00	BB	34.0	31.7	19.8	29.2	5.5	5.9	36.0	33.7	46.0	10.0	12.3
9.	840.00	BB	27.5	25.4	21.5	28.9	6.5	5.9	32.5	30.4	46.0	13.5	15.6

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

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DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 271E0337-YK-B-R1

Applicant	: RICOH COMPANY, LTD.		
Kind of Equipment	: Option(s) for Radiocommunications		
Model No.	: R-WL54MN		
Serial No.	: 704S0191		
Power	: AC120V/60Hz		
Mode	: Transmitting(5280MHz)		
Remarks	: IEEE802.11a		
Date	: 12/3/2007		
Test Distance	: 3 m		
Temperature	: 24 °C	Engineer	: Tatsuya Arai
Humidity	: 38 %		
Regulation	: FCC Part15C § 15.209		

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μ V/m]	MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
1.	80.01	BB	42.2	34.3	6.6	28.6	1.8	5.8	27.8	19.9	40.0	12.2	20.1
2.	148.66	BB	44.1	38.9	14.8	28.3	2.6	5.8	39.0	33.8	43.5	4.5	9.7
3.	160.03	BB	43.9	33.8	15.3	28.2	2.7	5.8	39.5	29.4	43.5	4.0	14.1
4.	180.01	BB	42.4	32.5	16.5	28.1	2.8	5.8	39.4	29.5	43.5	4.1	14.0
5.	240.03	BB	40.5	31.1	17.5	27.7	3.3	5.8	39.4	30.0	46.0	6.6	16.0
6.	320.05	BB	37.4	33.9	14.8	27.6	4.1	5.9	34.6	31.1	46.0	11.4	14.9
7.	480.02	BB	33.1	34.7	17.8	28.9	5.5	5.9	33.4	35.0	46.0	12.6	11.0
8.	600.02	BB	33.9	30.5	19.8	29.2	5.9	5.9	36.3	32.9	46.0	9.7	13.1
9.	720.02	BB	28.7	24.3	20.3	29.1	6.4	5.9	32.2	27.8	46.0	13.8	18.2

CALCULATION: READING + ANT.FACTOR + CABLE LOSS - AMP.GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 271E0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
 Kind of Equipment : Option(s) for Radiocommunications
 Model No. : R-WL54MN
 Serial No. : 704S0191
 Power : AC120V/60Hz
 Mode : Transmitting (5320MHz)
 Remarks : IEEE802.11a
 Date : 5/15/2007
 Test Distance : 3 m
 Temperature : 23 °C
 Humidity : 53 %
 Regulation : FCC Part15C § 15.209

Engineer : Takahiro Suzuki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	80.00	BB	44.8	46.1	6.6	28.6	1.8	5.8	30.4	31.7	40.0	9.6	8.3
2.	147.69	BB	46.6	42.1	14.8	28.3	2.5	5.8	41.4	36.9	43.5	2.1	6.6
3.	180.00	BB	41.2	30.4	16.5	28.1	2.8	5.8	38.2	27.4	43.5	5.3	16.1
4.	200.00	BB	32.2	27.6	16.9	27.9	2.9	5.8	29.9	25.3	43.5	13.6	18.2
5.	240.00	BB	38.5	29.9	17.5	27.7	3.3	5.8	37.4	28.8	46.0	8.6	17.2
6.	320.00	BB	41.7	33.3	14.8	27.6	3.9	5.9	38.7	30.3	46.0	7.3	15.7
7.	360.00	BB	37.4	31.7	15.9	28.0	4.3	5.9	35.5	29.8	46.0	10.5	16.2
8.	600.00	BB	33.8	31.9	19.8	29.2	5.5	5.9	35.8	33.9	46.0	10.2	12.1
9.	840.00	BB	27.7	25.6	21.5	28.9	6.5	5.9	32.7	30.6	46.0	13.3	15.4

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz / KLA-03 (USLP9143) 300-1000MHz
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

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DATA OF RADIATION TEST (Above 1GHz)

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD

Equipment : Option(s) for Radiocommunications

Model : R-WL54MN

Sample No. : 704S0191

Power : AC120V/60Hz

Mode : Transmitting (5180MHz)

FCC ID : BBP-WLRWL541

Regulation : FCC Part15E Section 15.407

Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m

Date : 2007/5/17

Temperature : 22deg.C

Humidity : 54%

ENGINEER : Takahiro Suzuki

PK DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1583.89	46.4	49.1	26.3	35.8	2.9	10.1	0.0	49.9	52.6	74.0	24.1	21.4
2	5150.00	42.6	43.7	34.5	34.6	5.5	0.8	0.0	48.8	49.9	74.0	25.2	24.1
3	10360.00	44.8	50.3	39.0	35.9	8.2	0.4	0.0	56.5	62.0	74.0	17.5	12.0
4	15540.00	48.1	47.6	40.1	33.1	9.7	0.8	0.0	65.6	65.1	74.0	8.4	8.9
5	20720.00	33.6	33.7	44.9	38.3	11.0	0.0	9.5	41.7	41.8	74.0	32.3	32.2
6	25900.00	32.9	33.0	46.2	39.3	13.0	0.0	9.5	43.3	43.4	74.0	30.7	30.6

AV DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1583.89	34.3	35.3	26.3	35.8	2.9	10.1	0.0	37.8	38.8	54.0	16.2	15.2
2	5150.00	31.3	32.8	34.5	34.6	5.5	0.8	0.0	37.5	39.0	54.0	16.5	15.0
3	10360.00	37.1	39.7	39.0	35.9	8.2	0.4	0.0	48.8	51.4	54.0	5.2	2.6
4	15540.00	34.3	34.2	40.1	33.1	9.7	0.8	0.0	51.8	51.7	54.0	2.2	2.3
5	20720.00	23.4	23.5	44.9	38.3	11.0	0.0	9.5	31.5	31.6	54.0	22.5	22.4
6	25900.00	22.8	22.6	46.2	39.3	13.0	0.0	9.5	33.2	33.0	54.0	20.8	21.0

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + ATT + Duty Factor - Distance Factor

Distance Factor calculation: $20 \times \log(3.0[m]/1.0[m]) = 9.5[dB]$

DATA OF RADIATION TEST (Above 1GHz)

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD

Equipment : Option(s) for Radiocommunications

Model : R-WL54MN

Sample No. : 704S0191

Power : AC120V/60Hz

Mode : Transmitting (5200MHz)

FCC ID : BBP-WLRWL541

Regulation : FCC Part15E Section 15.407

Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m

Date : 2007/12/4

Temperature : 23deg.C

Humidity : 40%

ENGINEER : Tatsuya Arai

PK DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1465.49	51.7	51.0	25.0	37.6	2.8	10.3	0.0	52.2	51.5	74.0	21.8	22.5
2	10400.00	43.4	43.9	38.4	36.5	8.2	1.2	0.0	54.7	55.2	74.0	19.3	18.8
3	15600.00	44.6	44.7	41.2	35.7	9.7	0.2	0.0	60.0	60.1	74.0	14.0	13.9
4	20800.00	30.2	29.7	45.6	38.5	11.3	0.0	9.5	39.1	38.6	74.0	34.9	35.4
5	26000.00	31.8	31.3	46.6	39.3	13.2	0.0	9.5	42.8	42.3	74.0	31.2	31.7

AV DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1465.49	34.9	34.9	25.0	37.6	2.8	10.3	0.0	35.4	35.4	54.0	18.6	18.6
2	10400.00	32.0	32.3	38.4	36.5	8.2	1.2	0.0	43.3	43.6	54.0	10.7	10.4
3	15600.00	33.4	33.6	41.2	35.7	9.7	0.2	0.0	48.8	49.0	54.0	5.2	5.0
4	20800.00	16.7	16.6	45.6	38.5	11.3	0.0	9.5	25.6	25.5	54.0	28.4	28.5
5	26000.00	18.1	18.2	46.6	39.3	13.2	0.0	9.5	29.1	29.2	54.0	24.9	24.8

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + ATT + Duty Factor - Distance Factor

Distance Factor calculation: $20 \cdot \log(3.0[m]/1.0[m]) = 9.5[dB]$

DATA OF RADIATION TEST (Above 1GHz)

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD

Equipment : Option(s) for Radiocommunications

Model : R-WL54MN

Sample No. : 704S0191

Power : AC120V/60Hz

Mode : Transmitting (5240MHz)

FCC ID : BBP-WLRWL541

Regulation : FCC Part15E Section 15.407

Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m

Date : 2007/12/4

Temperature : 23deg.C

Humidity : 40%

ENGINEER : Tatsuya Arai

PK DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1465.49	50.7	51.0	25.0	37.6	2.8	10.3	0.0	51.2	51.5	74.0	22.8	22.5
2	10480.00	43.5	43.8	38.6	36.5	8.4	1.3	0.0	55.3	55.6	74.0	18.7	18.4
3	15720.00	45.7	45.0	41.0	35.7	9.7	0.3	0.0	61.0	60.3	74.0	13.0	13.7
4	20960.00	30.5	30.7	45.7	38.7	11.7	0.0	9.5	39.7	39.9	74.0	34.3	34.1
5	26200.00	30.6	30.6	46.6	39.0	13.0	0.0	9.5	41.7	41.7	74.0	32.3	32.3

AV DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1465.49	35.1	34.8	25.0	37.6	2.8	10.3	0.0	35.6	35.3	54.0	18.4	18.7
2	10480.00	32.3	32.1	38.6	36.5	8.4	1.3	0.0	44.1	43.9	54.0	9.9	10.1
3	15720.00	33.3	33.5	41.0	35.7	9.7	0.3	0.0	48.6	48.8	54.0	5.4	5.2
4	20960.00	17.1	17.2	45.7	38.7	11.7	0.0	9.5	26.3	26.4	54.0	27.7	27.6
5	26200.00	17.5	17.5	46.6	39.0	13.0	0.0	9.5	28.6	28.6	54.0	25.4	25.4

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + ATT + Duty Factor - Distance Factor

Distance Factor calculation: $20 \cdot \log(3.0[m]/1.0[m]) = 9.5[dB]$

DATA OF RADIATION TEST (Above 1GHz)

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD

Equipment : Option(s) for Radiocommunications

Model : R-WL54MN

Sample No. : 704S0191

Power : AC120V/60Hz

Mode : Transmitting (5260MHz)

FCC ID : BBP-WLRWL541

Regulation : FCC Part15E Section 15.407

Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m

Date : 2007/5/17

Temperature : 22deg.C

Humidity : 54%

ENGINEER : Takahiro Suzuki

PK DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1598.36	45.8	49.3	26.5	35.8	3.0	10.1	0.0	49.6	53.1	74.0	24.4	20.9
2	10520.00	47.5	48.0	39.1	35.8	8.5	0.4	0.0	59.7	60.2	74.0	14.3	13.8
3	15780.00	48.6	48.6	40.4	33.0	9.6	0.8	0.0	66.4	66.4	74.0	7.6	7.6
4	21040.00	33.7	33.6	45.1	38.8	11.8	0.0	9.5	42.3	42.2	74.0	31.7	31.8
5	26300.00	32.8	32.7	46.2	38.9	13.0	0.0	9.5	43.6	43.5	74.0	30.4	30.5

AV DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1598.36	34.0	35.3	26.5	35.8	3.0	10.1	0.0	37.8	39.1	54.0	16.2	14.9
2	10520.00	37.2	39.2	39.1	35.8	8.5	0.4	0.0	49.4	51.4	54.0	4.6	2.6
3	15780.00	34.7	34.6	40.4	33.0	9.6	0.8	0.0	52.5	52.4	54.0	1.5	1.6
4	21040.00	23.2	23.3	45.1	38.8	11.8	0.0	9.5	31.8	31.9	54.0	22.2	22.1
5	26300.00	22.6	22.4	46.2	38.9	13.0	0.0	9.5	33.4	33.2	54.0	20.6	20.8

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + ATT + Duty Factor - Distance Factor

Distance Factor calculation: $20 \cdot \log(3.0[m]/1.0[m]) = 9.5[dB]$

DATA OF RADIATION TEST (Above 1GHz)

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD

Equipment : Option(s) for Radiocommunications

Model : R-WL54MN

Sample No. : 704S0191

Power : AC120V/60Hz

Mode : Transmitting (5280MHz)

FCC ID : BBP-WLRWL541

Regulation : FCC Part15E Section 15.407

Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m

Date : 2007/12/4

Temperature : 23deg.C

Humidity : 40%

ENGINEER : Tatsuya Arai

PK DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1465.49	49.1	51.2	25.0	37.6	2.8	10.3	0.0	49.6	51.7	74.0	24.4	22.3
2	10560.00	43.9	43.7	38.7	36.5	8.5	1.2	0.0	55.8	55.6	74.0	18.2	18.4
3	15840.00	45.9	45.3	40.8	35.6	9.6	0.3	0.0	61.0	60.4	74.0	13.0	13.6
4	21120.00	31.3	31.0	45.7	38.8	11.9	0.0	9.5	40.6	40.3	74.0	33.4	33.7
5	26400.00	30.2	30.5	46.6	38.7	12.9	0.0	9.5	41.5	41.8	74.0	32.5	32.2

AV DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1465.49	34.4	34.8	25.0	37.6	2.8	10.3	0.0	34.9	35.3	54.0	19.1	18.7
2	10560.00	32.4	32.3	38.7	36.5	8.5	1.2	0.0	44.3	44.2	54.0	9.7	9.8
3	15840.00	33.6	33.8	40.8	35.6	9.6	0.3	0.0	48.7	48.9	54.0	5.3	5.1
4	21120.00	18.0	18.2	45.7	38.8	11.9	0.0	9.5	27.3	27.5	54.0	26.7	26.5
5	26400.00	17.3	17.4	46.6	38.7	12.9	0.0	9.5	28.6	28.7	54.0	25.4	25.3

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + ATT + Duty Factor - Distance Factor

Distance Factor calculation: $20 \times \log(3.0[m]/1.0[m]) = 9.5[dB]$

DATA OF RADIATION TEST (Above 1GHz)

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD

Equipment : Option(s) for Radiocommunications

Model : R-WL54MN

Sample No. : 704S0191

Power : AC120V/60Hz

Mode : Transmitting (5320MHz)

FCC ID : BBP-WLRWL541

Regulation : FCC Part15E Section 15.407

Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m

Date : 2007/5/17

Temperature : 22deg.C

Humidity : 54%

ENGINEER : Takahiro Suzuki

PK DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
		[dBuV]							[dBuV/m]			[dB]	
1	1591.00	45.4	47.6	26.4	35.8	2.9	10.1	0.0	49.0	51.2	74.0	25.0	22.8
2	5350.00	41.2	40.9	34.7	34.7	5.6	0.9	0.0	47.7	47.4	74.0	26.3	26.6
3	10640.00	46.8	48.2	39.0	35.8	8.5	0.4	0.0	58.9	60.3	74.0	15.1	13.7
4	15960.00	48.5	47.9	40.6	32.9	9.6	0.9	0.0	66.7	66.1	74.0	7.3	7.9
5	21280.00	33.5	33.2	45.1	38.7	11.9	0.0	9.5	42.3	42.0	74.0	31.7	32.0

AV DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR	VER						HOR	VER		HOR	VER
		[dBuV]							[dBuV/m]			[dB]	
1	1591.00	34.1	35.1	26.4	35.8	2.9	10.1	0.0	37.7	38.7	54.0	16.3	15.3
2	5350.00	30.7	30.6	34.7	34.7	5.6	0.9	0.0	37.2	37.1	54.0	16.8	16.9
3	10640.00	37.2	37.3	39.0	35.8	8.5	0.4	0.0	49.3	49.4	54.0	4.7	4.6
4	15960.00	33.7	33.6	40.6	32.9	9.6	0.9	0.0	51.9	51.8	54.0	2.1	2.2
5	21280.00	23.2	23.1	45.1	38.7	11.9	0.0	9.5	32.0	31.9	54.0	22.0	22.1

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + ATT + Duty Factor - Distance Factor

Distance Factor calculation: $20 \cdot \log(3.0[m]/1.0[m]) = 9.5[dB]$

DATA OF RADIATION TEST (Above 1GHz)

***used conversion formula**

Company : RICOH COMPANY, LTD Equipment : Option(s) for Radiocommunications Model : R-WL54MN Sample No. : 704S0191 Power : AC120V/60Hz Mode : Transmitting (5180MHz) FCC ID : BBP-WLRWL541	UL Japan, Inc. YAMAKITA NO.1 ANECHOIC CHAMBER Report No. : 27IE0337-YK-B Regulation : FCC Part15E Section 15.407 Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m Date : 2007/5/17 Temperature : 22deg.C Humidity : 54%
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ENGINEER : Takahiro Suzuki

No.	FREQ [MHz]	Electric Field Strength (After Factor Calculation)		Result (EIRP)		LIMIT [dBm]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]	HOR [dBm]	VER [dBm]		HOR [dB]	VER [dB]
1	1583.89	49.9	52.6	-45.3	-42.6	-27.0	18.3	15.6
2	5150.00	48.8	49.9	-46.4	-45.3	-27.0	19.4	18.3
3	10360.00	56.5	62.0	-38.7	-33.2	-27.0	11.7	6.2
4	15540.00	65.6	65.1	-29.6	-30.1	-27.0	2.6	3.1
5	20720.00	41.7	41.8	-63.1	-63.0	-27.0	36.1	36.0
6	25900.00	43.3	43.4	-61.5	-61.4	-27.0	34.5	34.4

Sample Calculation :

1-18GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:3[m]) ^ 2 } / 30) *10^3)

18-40GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:1[m]) ^ 2 } / 30) *10^3)

DATA OF RADIATION TEST (Above 1GHz)

***used conversion formula**

Company : RICOH COMPANY, LTD Equipment : Option(s) for Radiocommunications Model : R-WL54MN Sample No. : 704S0191 Power : AC120V/60Hz Mode : Transmitting (5200MHz) FCC ID : BBP-WLRWL541	UL Japan, Inc. YAMAKITA NO.1 ANECHOIC CHAMBER Report No. : 27IE0337-YK-B Regulation : FCC Part15E Section 15.407 Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m Date : 2007/12/4 Temperature : 23deg.C Humidity : 40%
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ENGINEER : Tatsuya Arai

No.	FREQ [MHz]	Electric Field Strength (After Factor Calculation)		Result (EIRP)		LIMIT [dBm]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]	HOR [dBm]	VER [dBm]		HOR [dB]	VER [dB]
1	1465.49	52.2	51.5	-43.0	-43.7	-27.0	16.0	16.7
3	10400.00	54.7	55.2	-40.5	-40.0	-27.0	13.5	13.0
4	15600.00	60.0	60.1	-35.2	-35.1	-27.0	8.2	8.1
5	20800.00	39.1	38.6	-65.7	-66.2	-27.0	38.7	39.2
6	26000.00	42.8	42.3	-62.0	-62.5	-27.0	35.0	35.5

Sample Calculation :

1-18GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:3[m]) ^ 2 } / 30) * 10^3)

18-40GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:1[m]) ^ 2 } / 30) * 10^3)

DATA OF RADIATION TEST (Above 1GHz)

***used conversion formula**

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD
 Equipment : Option(s) for Radiocommunications
 Model : R-WL54MN
 Sample No. : 704S0191
 Power : AC120V/60Hz
 Mode : Transmitting (5240MHz)
 FCC ID : BBP-WLRWL541

Regulation : FCC Part15E Section 15.407
 Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m
 Date : 2007/12/4
 Temperature : 23deg.C
 Humidity : 40%

ENGINEER : Tatsuya Arai

No.	FREQ [MHz]	Electric Field Strength (After Factor Calculation)		Result (EIRP)		LIMIT [dBm]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]	HOR [dBm]	VER [dBm]		HOR [dB]	VER [dB]
1	1465.49	51.2	51.5	-44.0	-43.7	-27.0	17.0	16.7
3	10480.00	55.3	55.6	-39.9	-39.6	-27.0	12.9	12.6
4	15720.00	61.0	60.3	-34.2	-34.9	-27.0	7.2	7.9
5	20960.00	39.7	39.9	-65.1	-64.9	-27.0	38.1	37.9
6	26200.00	41.7	41.7	-63.1	-63.1	-27.0	36.1	36.1

Sample Calculation :

1-18GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:3[m]) ^ 2 } / 30) * 10^3)

18-40GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:1[m]) ^ 2 } / 30) * 10^3)

DATA OF RADIATION TEST (Above 1GHz)

***used conversion formula**

Company : RICOH COMPANY, LTD Equipment : Option(s) for Radiocommunications Model : R-WL54MN Sample No. : 704S0191 Power : AC120V/60Hz Mode : Transmitting (5260MHz) FCC ID : BBP-WLRWL541	UL Japan, Inc. YAMAKITA NO.1 ANECHOIC CHAMBER Report No. : 27IE0337-YK-B Regulation : FCC Part15E Section 15.407 Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m Date : 2007/5/17 Temperature : 22deg.C Humidity : 54%
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ENGINEER : Takahiro Suzuki

No.	FREQ [MHz]	Electric Field Strength (After Factor Calculation)		Result (EIRP)		LIMIT [dBm]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]	HOR [dBm]	VER [dBm]		HOR [dB]	VER [dB]
1	1598.36	49.6	53.1	-45.6	-42.1	-27.0	18.6	15.1
2	10520.00	59.7	60.2	-35.5	-35.0	-27.0	8.5	8.0
3	15780.00	66.4	66.4	-28.8	-28.8	-27.0	1.8	1.8
4	21040.00	42.3	42.2	-62.5	-62.6	-27.0	35.5	35.6
5	26300.00	43.6	43.5	-61.2	-61.3	-27.0	34.2	34.3

Sample Calculation :

1-18GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:3[m]) ^ 2 } / 30) * 10^3)

18-40GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:1[m]) ^ 2 } / 30) * 10^3)

DATA OF RADIATION TEST (Above 1GHz)

***used conversion formula**

Company : RICOH COMPANY, LTD Equipment : Option(s) for Radiocommunications Model : R-WL54MN Sample No. : 704S0191 Power : AC120V/60Hz Mode : Transmitting (5280MHz) FCC ID : BBP-WLRWL541	UL Japan, Inc. YAMAKITA NO.1 ANECHOIC CHAMBER Report No. : 27IE0337-YK-B Regulation : FCC Part15E Section 15.407 Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m Date : 2007/12/4 Temperature : 23deg.C Humidity : 40%
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ENGINEER : Tatsuya Arai

No.	FREQ [MHz]	Electric Field Strength (After Factor Calculation)		Result (EIRP)		LIMIT [dBm]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]	HOR [dBm]	VER [dBm]		HOR [dB]	VER [dB]
1	1465.49	49.6	51.7	-45.6	-43.5	-27.0	18.6	16.5
3	10560.00	55.8	55.6	-39.4	-39.6	-27.0	12.4	12.6
4	15840.00	61.0	60.4	-34.2	-34.8	-27.0	7.2	7.8
5	21120.00	40.6	40.3	-64.2	-64.5	-27.0	37.2	37.5
6	26400.00	41.5	41.8	-63.3	-63.0	-27.0	36.3	36.0

Sample Calculation :

1-18GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:3[m]) ^ 2 } / 30) * 10^3)

18-40GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:1[m]) ^ 2 } / 30) * 10^3)

DATA OF RADIATION TEST (Above 1GHz)

***used conversion formula**

Company : RICOH COMPANY, LTD Equipment : Option(s) for Radiocommunications Model : R-WL54MN Sample No. : 704S0191 Power : AC120V/60Hz Mode : Transmitting (5320MHz) FCC ID : BBP-WLRWL541	UL Japan, Inc. YAMAKITA NO.1 ANECHOIC CHAMBER Report No. : 27IE0337-YK-B Regulation : FCC Part15E Section 15.407 Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m Date : 2007/5/17 Temperature : 22deg.C Humidity : 54%
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ENGINEER : Takahiro Suzuki

No.	FREQ [MHz]	Electric Field Strength (After Factor Calculation)		Result (EIRP)		LIMIT [dBm]	MARGIN	
		HOR [dBuV/m]	VER [dBuV/m]	HOR [dBm]	VER [dBm]		HOR [dB]	VER [dB]
1	1591.00	49.0	51.2	-46.2	-44.0	-27.0	19.2	17.0
2	5350.00	47.7	47.4	-47.5	-47.8	-27.0	20.5	20.8
3	10640.00	58.9	60.3	-36.3	-34.9	-27.0	9.3	7.9
4	15960.00	66.7	66.1	-28.5	-29.1	-27.0	1.5	2.1
5	21280.00	42.3	42.0	-62.5	-62.8	-27.0	35.5	35.8

Sample Calculation :

1-18GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:3[m]) ^ 2 } / 30) * 10^3)

18-40GHz:Result(EIRP[dBm])=10*LOG(({ (Electric Field Strength [V/m] * Distance:1[m]) ^ 2 } / 30) * 10^3)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 271E0337-YK-B-R1

Applicant : RICOH COMPANY, LTD.
 Kind of Equipment : Option(s) for Radiocommunications
 Model No. : R-WL54MN
 Serial No. : 704S0191
 Power : AC120V/60Hz
 Mode : Receiving(5260MHz)
 Remarks : IEEE802.11a
 Date : 5/15/2007
 Test Distance : 3 m
 Temperature : 23 °C
 Humidity : 53 %
 Regulation : FCC Part15C § 15.209

Engineer : Takahiro Suzuki

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	80.00	BB	46.1	46.9	6.6	28.6	1.8	5.8	31.7	32.5	40.0	8.3	7.5
2.	147.76	BB	46.7	41.7	14.8	28.3	2.5	5.8	41.5	36.5	43.5	2.0	7.0
3.	180.00	BB	41.3	30.7	16.5	28.1	2.8	5.8	38.3	27.7	43.5	5.2	15.8
4.	200.00	BB	37.3	29.9	16.9	27.9	2.9	5.8	35.0	27.6	43.5	8.5	15.9
5.	240.00	BB	40.3	30.3	17.5	27.7	3.3	5.8	39.2	29.2	46.0	6.8	16.8
6.	320.00	BB	40.9	32.6	14.8	27.6	3.9	5.9	37.9	29.6	46.0	8.1	16.4
7.	360.00	BB	37.7	32.2	15.9	28.0	4.3	5.9	35.8	30.3	46.0	10.2	15.7
8.	600.00	BB	34.1	32.0	19.8	29.2	5.5	5.9	36.1	34.0	46.0	9.9	12.0
9.	840.00	BB	30.3	25.5	21.5	28.9	6.5	5.9	35.3	30.5	46.0	10.7	15.5

CALCULATION: READING + ANT. FACTOR + CABLE LOSS - AMP. GAIN + ATTEN.

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

Page:

DATA OF RADIATION TEST (Above 1GHz)

UL Japan, Inc.

YAMAKITA NO.1 ANECHOIC CHAMBER

Report No. : 27IE0337-YK-B

Company : RICOH COMPANY, LTD

Equipment : Option(s) for Radiocommunications

Model : R-WL54MN

Sample No. : 704S0191

Power : AC120V/60Hz

Mode : Receiving (5260MHz)

FCC ID : BBP-WLRWL541

Regulation : FCC Part15B Section 15.109 (a)

Test Distance : 1-18GHz: 3m, 18GHz-40GHz: 1m

Date : 2007/5/17

Temperature : 22deg.C

Humidity : 54%

ENGINEER : Takahiro Suzuki

PK DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1725.14	54.9	55.3	27.6	35.7	3.1	0.0	0.0	49.9	50.3	74.0	24.1	23.7
2	2249.08	50.3	50.9	29.9	35.5	3.5	0.0	0.0	48.2	48.8	74.0	25.8	25.2
3	5260.00	39.7	40.4	34.6	34.6	5.5	0.0	0.0	45.2	45.9	74.0	28.8	28.1
4	10520.00	46.3	47.2	39.1	35.8	8.5	0.0	0.0	58.1	59.0	74.0	15.9	15.0
5	15780.00	48.9	47.9	40.4	33.0	9.6	0.0	0.0	65.9	64.9	74.0	8.1	9.1
6	21040.00	33.6	33.7	45.1	38.8	11.8	0.0	9.5	42.2	42.3	74.0	31.8	31.7
7	26300.00	33.4	33.5	46.2	38.9	13.0	0.0	9.5	44.2	44.3	74.0	29.8	29.7

AV DETECT

No.	FREQ [MHz]	READING		ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN [dB]	Distance Factor [dB]	RESULT		LIMIT [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]						HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	1725.14	37.1	36.5	27.6	35.7	3.1	0.0	0.0	32.1	31.5	54.0	21.9	22.5
2	2249.08	34.8	35.4	29.9	35.5	3.5	0.0	0.0	32.7	33.3	54.0	21.3	20.7
3	5260.00	29.8	30.4	34.6	34.6	5.5	0.0	0.0	35.3	35.9	54.0	18.7	18.1
4	10520.00	37.4	37.1	39.1	35.8	8.5	0.0	0.0	49.2	48.9	54.0	4.8	5.1
5	15780.00	34.6	34.5	40.4	33.0	9.6	0.0	0.0	51.6	51.5	54.0	2.4	2.5
6	21040.00	23.8	23.8	45.1	38.8	11.8	0.0	9.5	32.4	32.4	54.0	21.6	21.6
7	26300.00	23.1	23.2	46.2	38.9	13.0	0.0	9.5	33.9	34.0	54.0	20.1	20.0

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + ATT + Duty Factor - Distance Factor

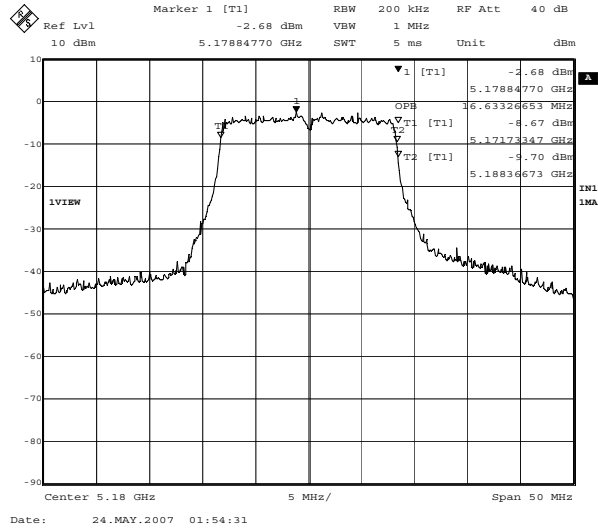
Distance Factor calculation: $20 \times \log(3.0[m]/1.0[m]) = 9.5[dB]$

Occupied Bandwidth(99%)

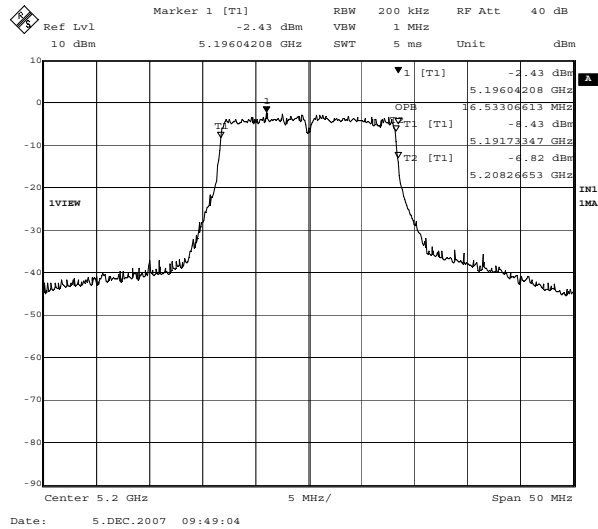
COMPANY : RICOH COMPANY, LTD
 EQUIPMENT : Option(s) for Radiocommunications
 MODEL NUMBER: R-WL54MN
 SERIAL NUMBER: 704S0191
 FCC ID : BBP-WLRWL541
 POWER : AC120V/60Hz
 [IEEE802.11a (54Mbps)]

UL Japan, Inc. Yamakita No.2 Shielded Room
 REPORT NO : 27IE0337-YK-B-R1
 REGULATION : RSS-210
 DATE : 2007/05/24, 2007/12/5
 TEMP./HUMI : 24°C/48%, 25°C/41%
 TEST MODE : Transmitting
 ENGINEER : Tatsuya Arai

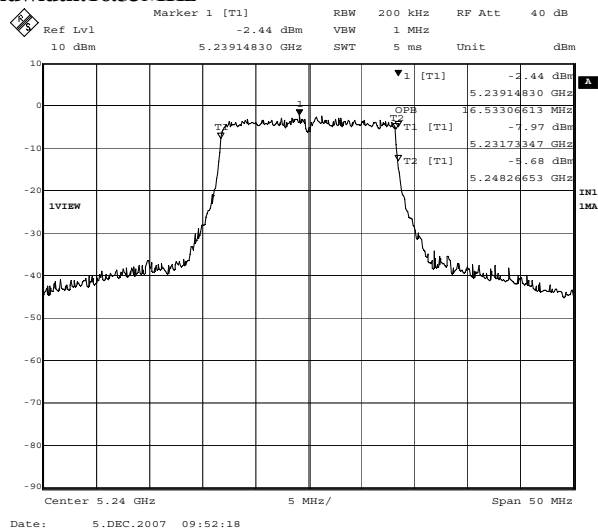
1. Ch 36: 5180MHz/ Occupied Bandwidth:16.63MHz



2. Ch 40: 5200MHz/ Occupied Bandwidth:16.53MHz



3. Ch 48: 5240MHz/ Occupied Bandwidth:16.53MHz

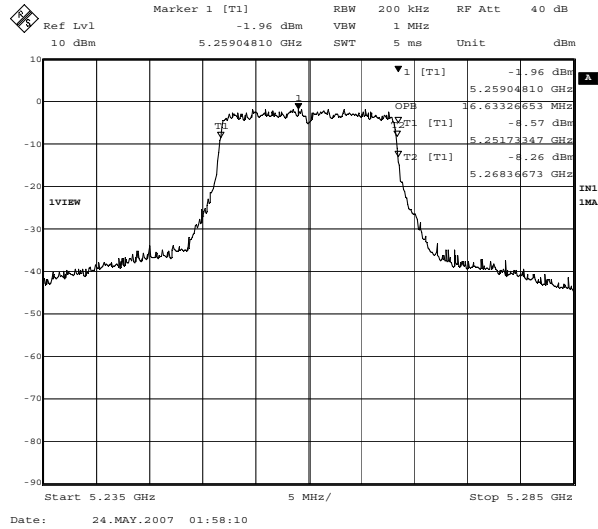


Occupied Bandwidth(99%)

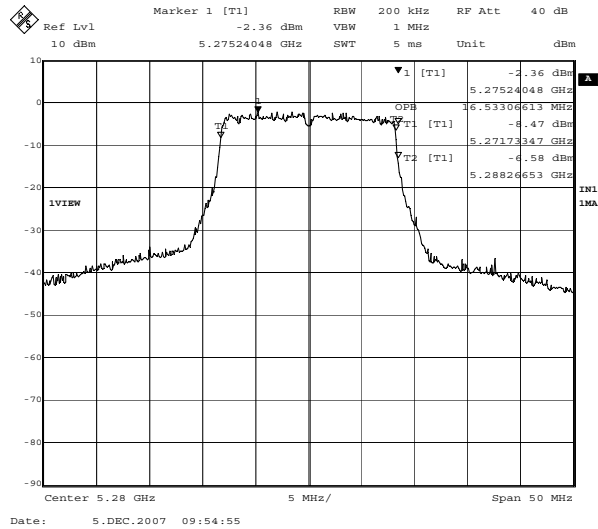
COMPANY : RICOH COMPANY, LTD
EQUIPMENT : Option(s) for Radiocommunications
MODEL NUMBER: R-WL54MN
SERIAL NUMBER: 704S0191
FCC ID : BBP-WLRWL541
POWER : AC120V/60Hz
[IEEE802.11a (54Mbps)]

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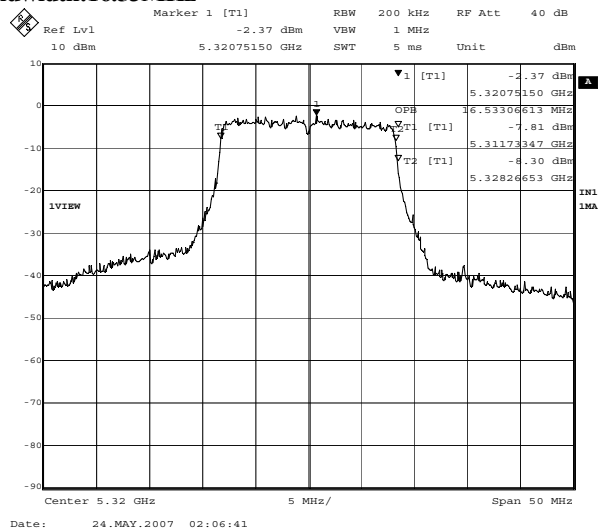
4. Ch 52: 5260MHz/ Occupied Bandwidth:16.63MHz



5. Ch 56: 5280MHz/ Occupied Bandwidth:16.53MHz



6. Ch 64: 5320MHz/ Occupied Bandwidth:16.53MHz



APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
YA-CE	Conducted emission(software)	UL Japan	CE(Ver.1.6)	CE	-
YA-RE	Radiated emission(software)	UL Japan	RE(Ver.1.5)	RE	-
KAEC-01(NSA)	Anechoic Chamber	JSE	Semi 3m	RE	2007/08/26 * 12
KAF-05	Pre Amplifier	Agilent	8447D	RE	2007/04/13 * 12
KAT6-01	Attenuator	INMET	18N-6dB	RE	2007/03/28 * 12
KCC-30/31/32/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	RE	2007/11/01 * 12
KCC-33/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	CE	2007/11/01 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2007/01/06 * 12
KLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2007/08/02 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	CE/RE	2007/09/25 * 12
KOS-01	Humidity Indicator	Custom	CTH-190	CE/AT all	2006/07/14 * 24
KOS-02	Humidity Indicator	Custom	CTH-190	RE	2006/07/10 * 24
KAF-06	Pre Amplifier	TSJ	MLA-1840B02-35	RE	2007/02/05 * 12
KAT10-S1	Attenuator	Agilent	8490D 010	RE	2007/04/11 * 12
KCC-D16/D17	Coaxial Cable	INSULATED WIRE INC	KPS-1501-200-KPS/KPS-1501-2000-KPS	RE	2007/02/05 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2007/08/14 * 12
KHA-06	Horn Antenna	ETS LINDGREN	3116	RE	2007/08/16 * 12
APPRA05	Pre Amplifier	Hewlett Packard	8449B	RE	2006/12/21 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ES140	CE/RE/AT all	2007/04/12 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2007/01/06 * 12
KFL-15	Highpass Filter	MICRO-TRONICS	HPM50112	RE	2006/12/13 * 12
KCC-D7	Coaxial Cable	Advantest	A01002	AT all	2007/04/11 * 12
KTR-04	Test Receiver	Rohde & Schwarz	ESVS10	RE	2007/10/30 * 12
KJM-01	Measure	TAJIMA	GL19-55	RE/CE	-
KAT10-S2	Attenuator	Agilent	8490D 010	RE	2006/12/13 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	RE	2007/04/24 * 12
KTR-03	Test Receiver	Rohde & Schwarz	ESHS10	CE	2007/02/05 * 12
KCC-D16	Coaxial Cable	INSULATED WIRE INC	KPS-1501-200-KPS	AT all	2007/02/05 * 12

The expiration date of the calibration is the end of the expired month .

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

Test Item :

CE: Conducted Emission

RE: Out of Band Emission (Radiated)

AT: Antenna terminal conducted test

1: Bandwidth

2: Maximum Peak Output Power

3: Out of Band Emission (Conducted)

4: Peak Power Spectral Density

5: Peak Excursion Ratio

*Some calibrations were performed after the tested dates , however those EMI test equipment have been controlled by means of an unbroken chains of calibrations .