EMI TEST REPORT

Test Report No. : 24GE0192-HO-1

Applicant	:	**SATO CORPORATION**
Type of Equipment	:	**Wireless LAN SiP Module**
Model No.	:	**WM-B-AG-02**
Test standard	:	**FCC Part 15 Subpart C Section 15.207, Section 15.247 : 2003**
FCC ID	:	**MMFMB200-W1**
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: March 11, 17, April 20 and May 12

Tested by:

Mitsuru Fujimura
EMC Service

Kenichi Adachi
EMC Service

Approved by :

Naoki Sakamoto
Group Leader of
EMC Service

UL Apex Co., Ltd.
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SECTION 1: Client information

Company Name	:	SATO CORPORATION
Brand name	:	SATO
Address	:	1-207, Onari-cho, Omiya-ku, Saitama-shi, Saitama 330-0852 Japan
Telephone Number	:	+81-48-663-8118
Facsimile Number	:	+81-48-651-6662
Contact Person	:	Masahiko Nanri

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless LAN SiP Module
Model No.	:	WM-B-AG-02
Serial No.	:	03UT02481658
Country of Manufacture	:	Malaysia
Rating	:	DC 3.3V
Receipt Date of Sample	:	March 11, 2004
Condition of EUT	:	Engineering Prototype (Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

SATO CORPORATION, Model No: WM-B-AG-02 is the Wireless LAN module.

[IEEE 802.11b]

Equipment Type	:	Transceiver
Frequency of operation	:	2412-2462MHz
Type of modulation	:	DSSS
Channel spacing	:	5MHz
Channel number	:	11
Antenna Type	:	chip Antenna
Antenna connector Type	:	W, FL-LP-N
Antenna Gain	:	2.044 dBi
ITU code	:	G1D
Power Supply	:	DC3.3V
Temperature of operation	:	+5 deg. C. to +35 deg. C.

FCC 15.31 (e)

The modular transmitter does not have its own power supply, but regulated power of 3.3V is supplied from host equipment Bar code Printer. Therefore, the equipment meets this requirement.

FCC Part 15.203 Antenna requirement

The modular transmitter must comply with the antenna requirements of Section 15.203.: The modular transmitter is installed in the end product by the professionals. Neither antenna nor cable is to be exchanged with any other replacement. Neither does the length of cable change.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2003

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits : 2003
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz : 2003

3.2 Procedures and results

[DSSS and other forms of modulation]

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	*See the worst margins(marked as shading) in the data sheet in APPENDIX 3 . .	Complied
2	6dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(2)	Conducted	N/A		Complied
3	Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(b)(3)	Conducted	N/A		Complied
4	Spurious Emission/Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (c)	Conducted/ Radiated	N/A		Complied
5	Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (c)	Conducted	N/A		Complied
6	Power Density	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (d)	Conducted	N/A		Complied

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

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 ±1.3dB.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB(3m)/ ±4.7dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB(3m)/ ±3.8dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ±6.6dB.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is ±3.0dB.

*These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".
*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	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
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

	Listed date (for FCC)	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	February 01, 2002	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	June 05, 2002	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	-	3.1 x 5.0 x 2.7m	N/A	-

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

3.5 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 exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used : [DSSS]

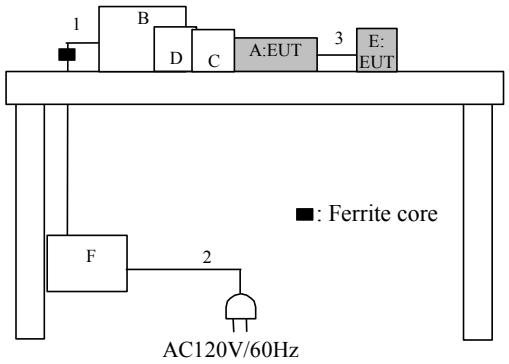
Transmitting mode (CCK 11Mbps)
Low Channel :2412MHz (Ch1)
Mid Channel :2437MHz (Ch6)
High Channel :2462MHz (Ch11)

The radio was transmitting at full power on the specified channels with the maximum allowed duty cycle and at a data rate of 11Mbps. Packet Type: Maximum, Payload : PN9.

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

4.2 Configuration and peripherals

4.2.1 Except for Conducted emission



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Wireless LAN module	WM-B-AG-02	03UT02481658	SATO CORPORATION	EUT, FCC ID: MMFMB200-W1
B	Notebook Personal Computer	PAP301JC	Y8038338	TOSHIBA	-
C	CF-SPI Adaptor	PCMK-G3X	-	SATO CORPORATION	-
D	CF-PC card Adaptor	PCCF-ADP	CMA1513776GS	I O DATA	-
E	Antenna	-	-	SATO CORPORATION	EUT*1 FCC ID: MMFMB200-W1
F	AC Adaptor	PA2501U	0273615	TOSHIBA	-

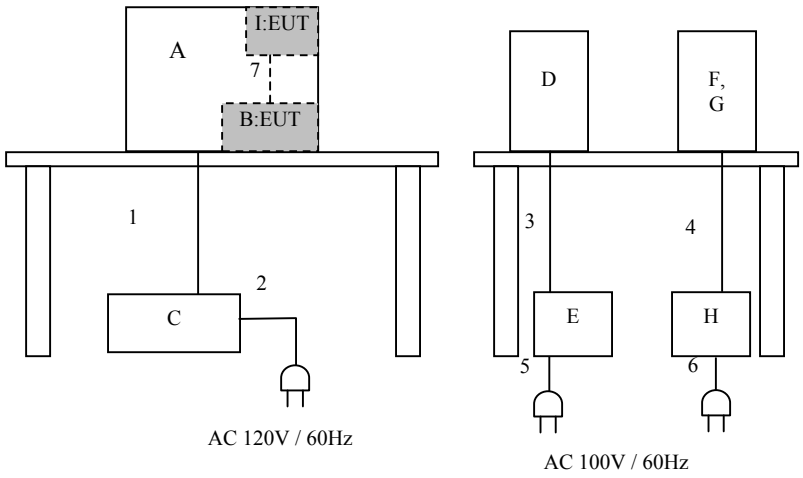
*1: Radiated Spurious emission only.

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	DC cable	2.0	N	Polyvinyl chloride
2	AC cable	1.0	N	Polyvinyl chloride
3	Antenna cable	0.05	Y	Polyvinyl chloride *1

*1: Radiated spurious emission only.

4.2.2 for Conducted emission



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Barcode Printer	MB200	206800001	SATO CORPORATION	-
B	Wireless LAN module	WM-B-AG-02	03UT02481658	SATO CORPORATION	EUT, FCC ID: MMFMB200-W1
C	AC Adapter	SA130A-0930U-S	-	SATO CORPORATION	-
D	Wireless LAN Access Point	WLA-B11(2)A	36623144218862	I O Data	-
E	AC Adapter	B4A06D	-	I O Data	-
F	Pocket PC	CET0100A	101142447A1	TOSHIBA	-
G	Wireless LAN card	WLI-CF-S11G	16601421220445	CONTEC	-
H	AC Adapter	CEX0107A	0110-A-0036059	TOSHIBA	-
I	Antenna	-	-	SATO CORPORATION	EUT, FCC ID: MMFMB200-W1

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	DC cable	2.0	N	Polyvinyl chloride
2	AC cable	0.5	N	Polyvinyl chloride
3	DC cable	1.2	N	Polyvinyl chloride
4	DC cable	1.5	N	Polyvinyl chloride
5	AC cable	0.5	N	Polyvinyl chloride
6	AC cable	0.5	N	Polyvinyl chloride
7	Antenna cable	0.05	Y	Polyvinyl chloride

[FHSS / DSSS and other forms of modulation's test requirements]

SECTION 5: Conducted Emission, Section 15.207

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center .
1) For the tests on EUT with other peripherals (as a whole system)
I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.
2) For the tests on EUT itself (as a stand alone equipment)
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 CISPR quasi-peak and Average detector (IF BW 9 kHz).
Measurement range: 0.15-30MHz

Test data : APPENDIX 3
Test result : Pass

Remarks : Regarding Conducted Emission test, there is no change in the data among the channels, and therefore low channel .was tested as representative.

SECTION 6: Spurious Emission 15.247(c)

[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, 1m by 1.5m, 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) and 1m(Upper 10GHz).
The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver or the Spectrum Analyzer.
In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

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

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

The Spurious emissions except Field strength of Fundamental and Harmonics could not be detected when the antenna board or antenna cable were not connected with the RF module board.
The configuration of the EUT was set up for the three axes of the antenna board.
The carrier level or, noise levels were measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.
With the position, the noise levels of all the frequencies was measured.

Test data : APPENDIX 3
Test result : Pass

SECTION 7: Bandwidth, Section 15.247(a)(1)(2)

Test Procedure

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

Test data : APPENDIX 3
Test result : Pass

SECTION 8: Maximum Peak Output Power, Section 15.247(b)(1)(3)

Test Procedure

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

The test for Peak Power was made with the Peak Power Sensor for the board spectrum.

Test data : APPENDIX 3
Test result : Pass

SECTION 9: Peak Power Density, Section 15.247 (d)

[Conducted]
Test Procedure
The Peak Power Density was measured with a spectrum analyzer connected to the antenna port.

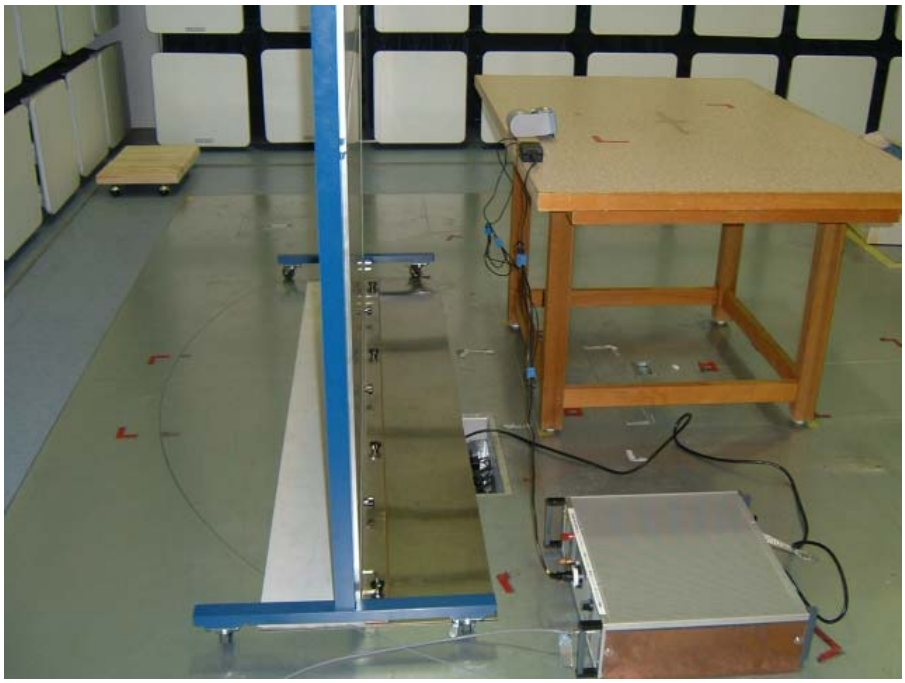
Test data : APPENDIX 3
Test result : Pass

APPENDIX 1: Photographs of test setup

Conducted Emission

Front

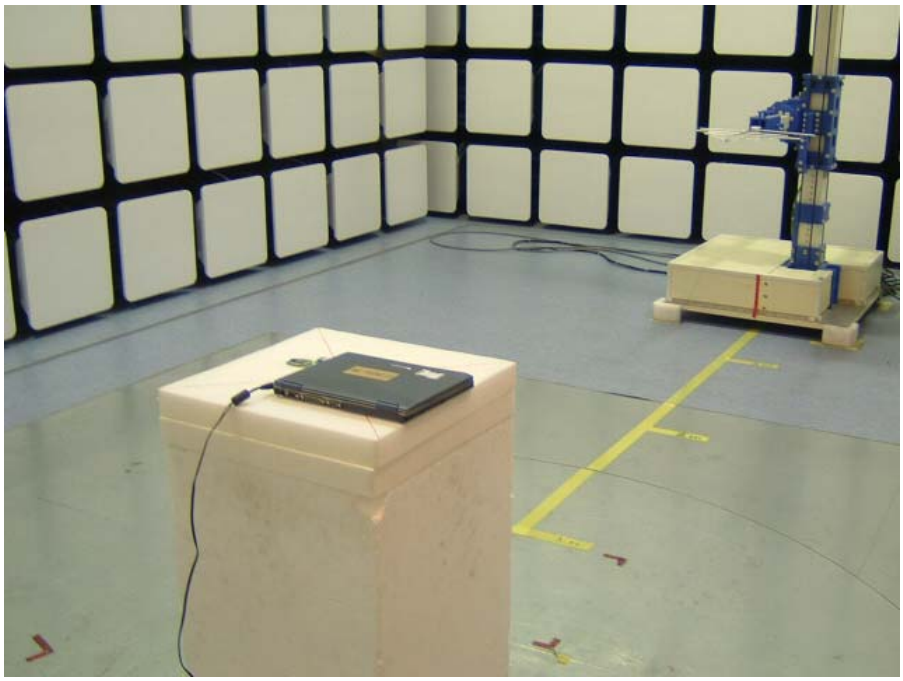
Rear



Spurious Emission (Radiated)

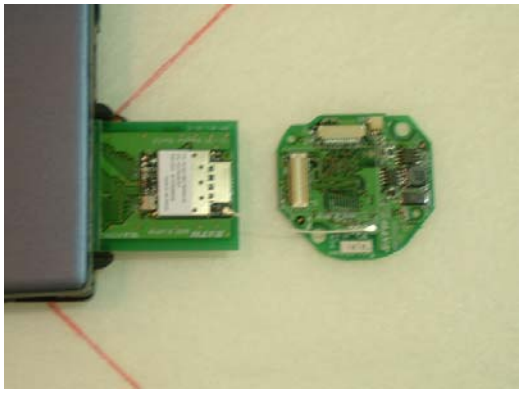
Front

Rear

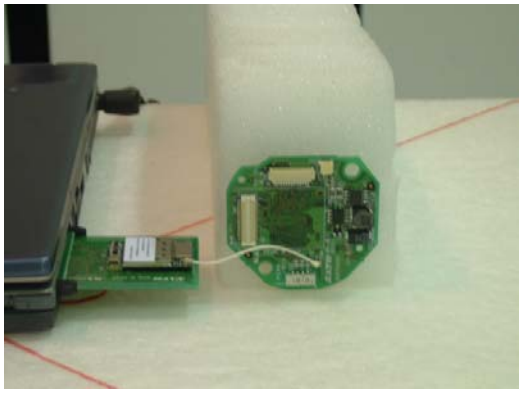


Worst Case Position (X-axis:Horizontal / X-axis:Vertical)

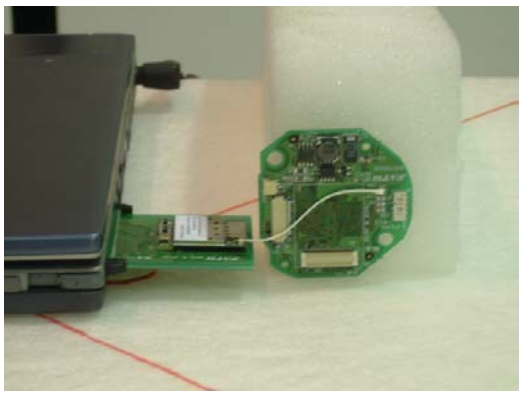
X-axis



Y-axis



Z-axis



APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MRENT-09	Spectrum Analyzer	Advantest	R3273	2,4,5,6	2004/02/18 * 12
MAT-20	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-110	2,3,4,5,6	2004/01/28 * 12
MPM-04	Power Meter	Agilent	E4416A	4	2004/03/03 * 12
MPSE-03	Power sensor	Agilent	E9327A	4	2003/11/03 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	3	2004/04/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	1,3	2004/02/03 * 12
MRENT-06	Spectrum Analyzer	Advantest	R3273	1,3	2003/10/31 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	3	2004/02/24 * 12
MPA-02	Pre Amplifier	Agilent	87405A	3	2004/04/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	3	2003/12/16 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	3	2003/10/15 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	3	2003/10/15 * 12
MCC-04	Microwave Cable	Storm	421-011	3	2004/01/06 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3	2004/02/06 * 12
MCC-24	Microwave Cable	Storm	-	3	2004/05/01 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	3	2004/01/10 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	3	2003/09/19 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	1	2004/02/24 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	1	2004/02/17 * 12

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

1: AC Main Conducted Emission
2: Antenna Terminal Conducted Spurious Emission
3: Radiated Spurious Emission
4: Maximum Peak Output Power
5: 6dB Bandwidth [DSSS]
6: Peak Output Power Density [DSSS]

APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

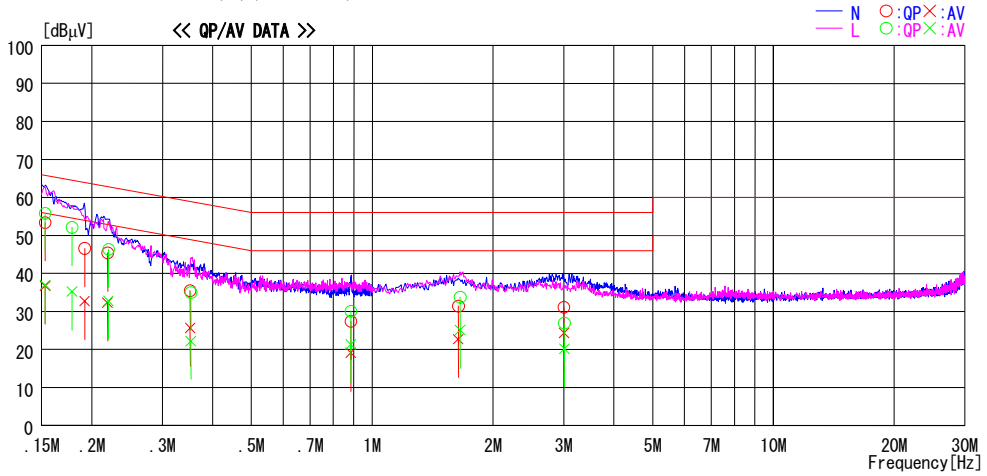
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/17 02:02:09

Applicant : SATO CORPORATION
Kind of EUT : W-LAN / BARCODE PRINTER
Model No. : MB200
Serial No. : 20680001

Report No. : 24GE0192-HO
Power : AC120V / 60Hz
Temp℃/Humi% : 23 / 40
Operator : Mitsuru Fujimura

Mode / Remarks : Printing mode (Transmitting mode chL)

LIMIT : FCC15B ClassB(QP)(0.15-30MHz)
FCC15B ClassB(AV)(0.15-30MHz)



NO	FREQ	READING QP	READING AV	C.F	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBμV]	[dBμV]	[dB]	[dBμV]	[dBμV]	[dBμV]	[dBμV]	[dB]	[dB]	
1	0.1530	53.3	36.6	0.1	53.4	36.7	65.8	55.8	12.4	19.1	N
2	0.1920	46.5	32.6	0.1	46.6	32.7	63.9	53.9	17.3	21.2	N
3	0.2190	45.3	32.2	0.1	45.4	32.3	62.9	52.9	17.5	20.6	N
4	0.3520	35.4	25.6	0.1	35.5	25.7	58.9	48.9	23.4	23.2	N
5	0.8840	27.3	19.0	0.1	27.4	19.1	56.0	46.0	28.6	26.9	N
6	1.6390	31.1	22.4	0.3	31.4	22.7	56.0	46.0	24.6	23.3	N
7	3.0070	30.7	23.9	0.4	31.1	24.3	56.0	46.0	24.9	21.7	N
8	0.1530	55.7	36.9	0.1	55.8	37.0	65.8	55.8	10.0	18.8	L
9	0.1785	52.0	35.1	0.1	52.1	35.2	64.6	54.6	12.5	19.4	L
10	0.2200	46.3	32.7	0.1	46.4	32.8	62.8	52.8	16.4	20.0	L
11	0.3530	34.9	22.1	0.1	35.0	22.2	58.9	48.9	23.9	26.7	L
12	0.8840	30.0	21.2	0.1	30.1	21.3	56.0	46.0	25.9	24.7	L
13	1.6570	33.5	24.8	0.3	33.8	25.1	56.0	46.0	22.2	20.9	L
14	3.0160	26.6	19.8	0.4	27.0	20.2	56.0	46.0	29.0	25.8	L

CHART:WITHOUT FACTOR,Peak hold data.Data is uncorrected.
Except for the above table : adequate margin data below the limits.

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

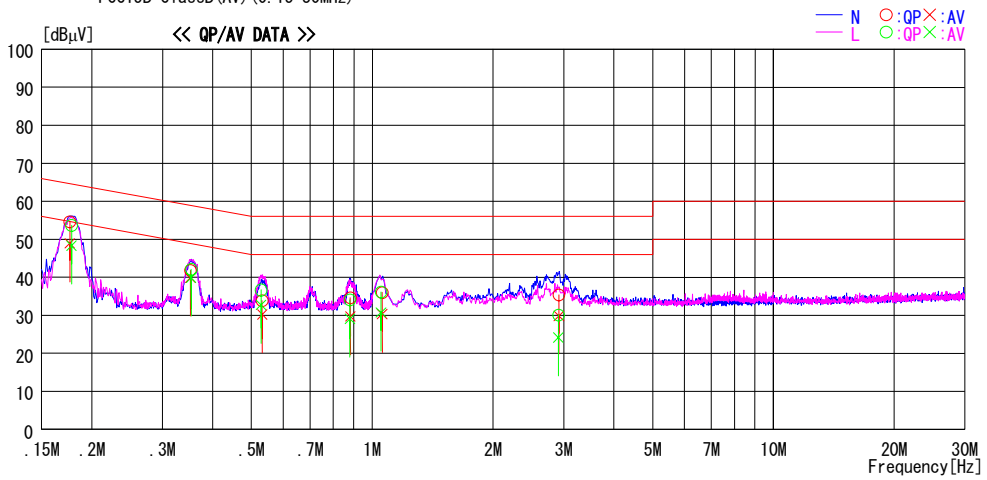
UL Apex Co., Ltd. Head Office EMC Lab. No2 Semi Anechoic Chamber
Date : 2004/03/17 02:40:52

Applicant : SATO CORPORATION
Kind of EUT : W-LAN / BARCODE PRINTER
Model No. : MB200
Serial No. : 20680001

Report No. : 24GE0192-HO
Power : AC120V / 60Hz
Temp℃/Humi% : 23 / 40
Operator : Mitsuru Fujimura

Mode / Remarks : Standby mode

LIMIT : FCC15B ClassB(QP) (0.15-30MHz)
FCC15B ClassB(AV) (0.15-30MHz)



NO	FREQ	READING QP	READING AV	C.F	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBμV]	[dBμV]	[dB]	[dBμV]	[dBμV]	[dBμV]	[dBμV]	[dB]	[dB]	
1	0.1763	54.5	48.8	0.1	54.6	48.9	64.7	54.7	10.1	5.8	N
2	0.3522	41.7	39.8	0.1	41.8	39.9	58.9	48.9	17.1	9.0	N
3	0.5321	33.7	30.0	0.2	33.9	30.2	56.0	46.0	22.1	15.8	N
4	0.8823	34.5	29.6	0.1	34.6	29.7	56.0	46.0	21.4	16.3	N
5	1.0592	35.8	30.1	0.2	36.0	30.3	56.0	46.0	20.0	15.7	N
6	2.9201	35.0	29.5	0.4	35.4	29.9	56.0	46.0	20.6	16.1	N
7	0.1780	53.5	48.2	0.1	53.6	48.3	64.6	54.6	11.0	6.3	L
8	0.3538	42.0	39.8	0.1	42.1	39.9	58.9	48.9	16.8	9.0	L
9	0.5285	36.5	32.5	0.2	36.7	32.7	56.0	46.0	19.3	13.3	L
10	0.8800	34.0	29.0	0.1	34.1	29.1	56.0	46.0	21.9	16.9	L
11	1.0515	35.9	30.5	0.2	36.1	30.7	56.0	46.0	19.9	15.3	L
12	2.9135	29.7	23.8	0.4	30.1	24.2	56.0	46.0	25.9	21.8	L

CHART:WITHOUT FACTOR,Peak hold data.Data is uncorrected.
Except for the above table : adequate margin data below the limits.

6dB Bandwidth(DSSS and other forms of modulation)

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

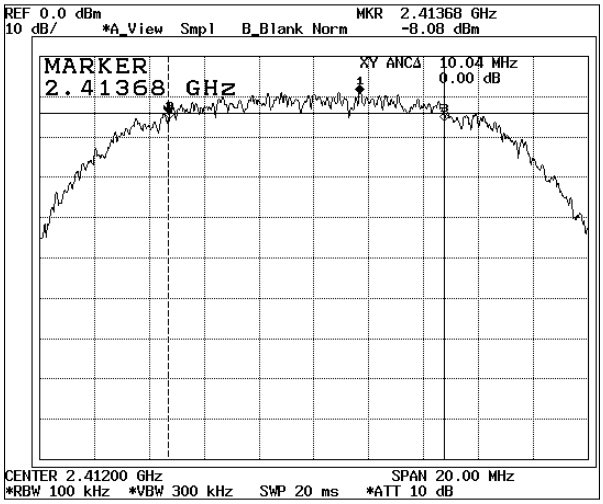
Company	: SATO CORPORATION	REPORT NO	: 24GE0192-HO
Equipment	: W-LAN module for W-LAN/BARCODE PRINTER	REGULATION	: Fcc Part15 Subpart C 15.247(a)
Model	: WM-B-AG-02	TEST DISTANCE	: -
Sample No.	: 03UT02481658	DATE	: March 11,2004
Power	: DC 3.3V (AC120V/60Hz)	TEMPERATURE	: 21 deg.C
Mode	: Transmitting (IEEE 802.11b) Burst Frame mode	HUMIDITY	: 46 %
	: 11Mbps		
		ENGINEER	: Kenichi Adachi

CH	FREQ [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
Low(1)	2412.0	10.04	500.0
Mid(6)	2437.0	10.12	500.0
High(11)	2462.0	**9.98**	500.0

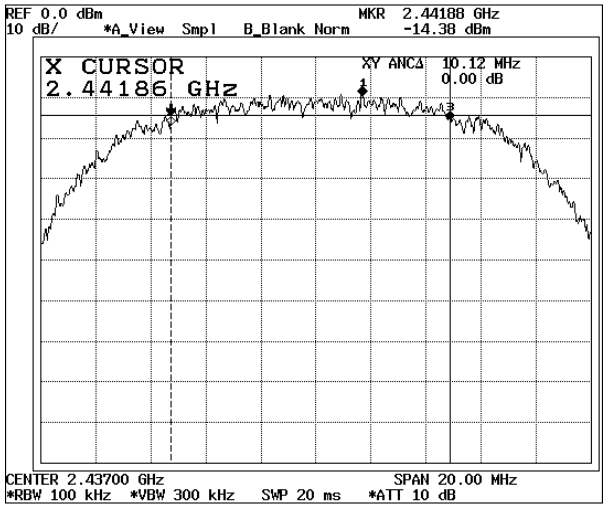
Test Instruments : MRENT-09, MAT-20 (10dB)

6dB Bandwidth(DSSS and other forms of modulation)

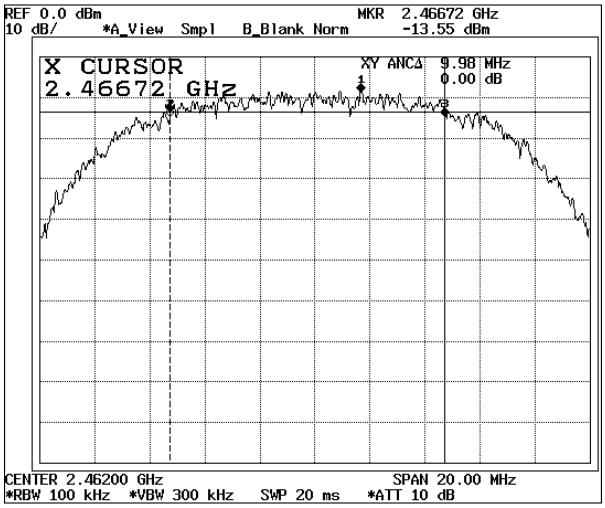
ch1 : Low



Ch6 : Mid



ch11 : High



Maximum Peak OutPut Power (DSSS and other forms of modulation)

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

Company	: SATO CORPORATION	REPORT NO	: 24GE0192-HO
Equipment	: W-LAN module for W-LAN/BARCODE PRINTER	REGULATION	: Fcc Part15 Subpart C 15.247(b)(3)
Model	: WM-B-AG-02	TEST DISTANCE	: -
Sample No.	: 03UT02481658	DATE	: March 11,2004
Power	: DC 3.3V (AC120V/60Hz)	TEMPERATURE	: 21 deg.C
Mode	: Transmitting (IEEE 802.11b) Burst Frame mode : 11Mbps	HUMIDITY	: 46 %
		ENGINEER	: Kenichi Adachi

Power Meter

ch	FREQ [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	ATTEN. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low(1)	2412.0	4.38	0.8	10.0	15.2	30.0	14.8
Mid(6)	2437.0	4.31	0.8	10.0	15.1	30.0	14.9
High(11)	2462.0	4.68	0.8	10.0	**15.5**	30.0	**14.5**

(Test Instruments)
(MPM-04, MPSE-03, MAT-20)

Sample Calculation:
Result = Reading + (Cable+ATTEN.)Loss

Remarks : This item was measured with cable that borrowed from the applicant. (Cable loss: 0.8dB)

Radiated Spurious Emission(DSSS and other forms of modulation)

DATA OF RADIATED EMISSION TEST

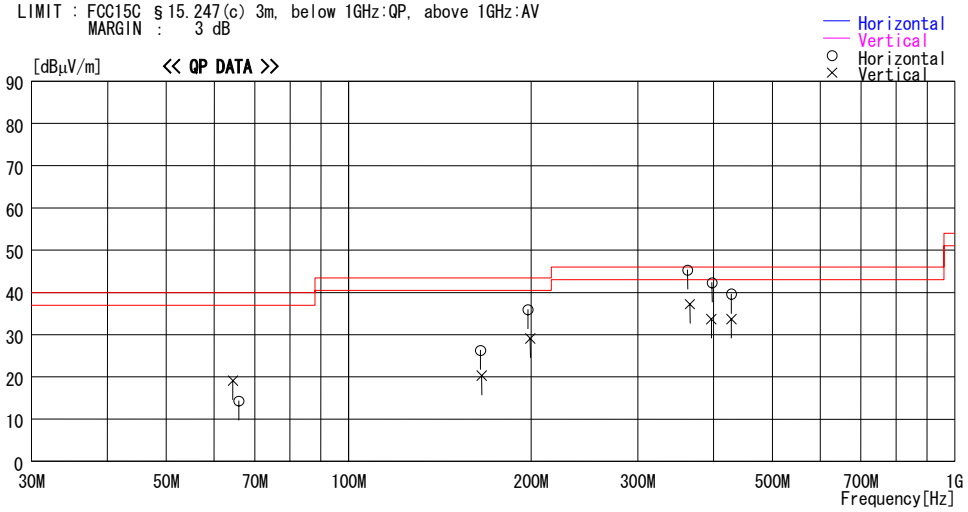
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/05/12 20:29:20

Applicant : SATO CORPORATION
Kind of EUT : Wireless LAN SiP Module
Model No. : WM-B-AG-02
Serial No. : 03UT02481658

Report No. : 24GE0192-HO
Power : DC3.3V
Temp℃/Humi% : 26℃ / 42%
Operator : Kenichi Adachi

Mode / Remarks : 30M-1GHz_Tx 2412 DATA PANA X-Axis

LIMIT : FCC15C §15.247(c) 3m, below 1GHz:QP, above 1GHz:AV
MARGIN : 3 dB



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	65.926	23.2	7.3	6.9	23.1	14.3	40.0	25.7	237	123
2	164.997	26.5	15.4	7.6	23.2	26.3	43.5	17.2	185	-1
3	197.725	34.4	16.7	7.8	23.0	35.9	43.5	7.6	100	149
4	362.400	42.7	16.7	8.6	22.7	45.3	46.0	0.7	100	335
5	398.009	38.1	18.2	8.8	22.8	42.3	46.0	3.7	100	218
6	428.136	34.9	18.3	9.1	22.7	39.6	46.0	6.4	260	302
----- Vertical ------										
7	64.431	27.8	7.5	6.9	23.1	19.1	40.0	20.9	100	146
8	165.778	20.4	15.5	7.6	23.2	20.3	43.5	23.2	100	239
9	199.410	27.5	16.8	7.8	23.0	29.1	43.5	14.4	100	225
10	365.700	34.6	16.8	8.6	22.8	37.2	46.0	8.8	314	238
11	396.637	29.5	18.2	8.8	22.8	33.7	46.0	12.3	238	262
12	428.152	29.0	18.3	9.1	22.7	33.7	46.0	12.3	147	225

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

Radiated Spurious Emission(DSSS and other forms of modulation)

DATA OF RADIATED EMISSION TEST

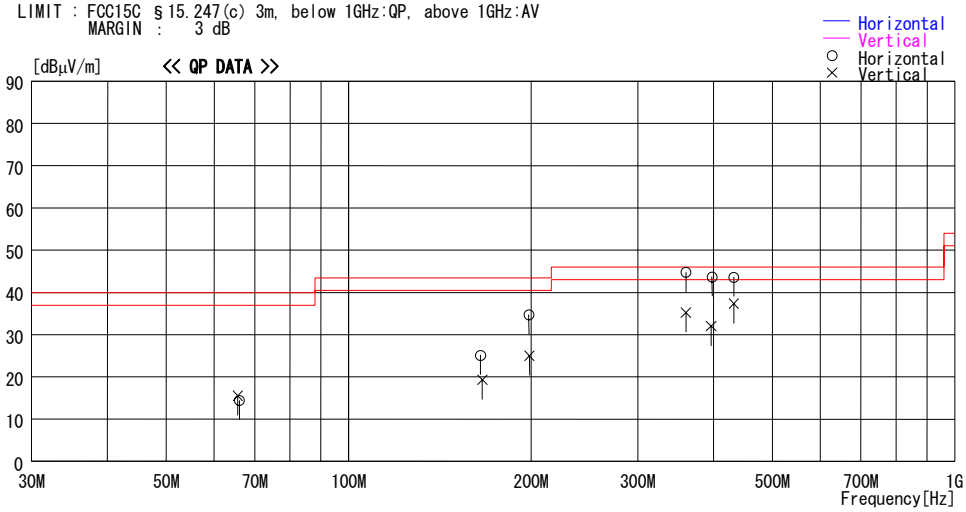
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/05/12 22:16:36

Applicant : SATO CORPORATION
Kind of EUT : Wireless LAN SiP Module
Model No. : WM-B-AG-02
Serial No. : 03UT02481658

Report No. : 24GE0192-HO
Power : DC3.3V
Temp℃/Humi% : 26℃ / 42%
Operator : Kenichi Adachi

Mode / Remarks : 30M-1GHz_Tx 2437 DATA PANA X-Axis

LIMIT : FCC15C §15.247(c) 3m, below 1GHz:QP, above 1GHz:AV
MARGIN : 3 dB



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	66.079	23.3	7.3	6.9	23.1	14.4	40.0	25.6	112	261
2	165.126	25.2	15.5	7.6	23.2	25.1	43.5	18.4	174	194
3	198.436	33.1	16.8	7.8	23.0	34.7	43.5	8.8	173	163
4	360.011	42.2	16.6	8.6	22.7	44.7	46.0	1.3	100	161
5	397.990	39.5	18.2	8.8	22.8	43.7	46.0	2.3	100	201
6	432.077	38.9	18.3	9.1	22.7	43.6	46.0	2.4	100	201
----- Vertical ------										
7	65.642	24.3	7.4	6.9	23.1	15.5	40.0	24.5	100	188
8	166.267	19.4	15.5	7.6	23.2	19.3	43.5	24.2	118	234
9	198.780	23.4	16.8	7.8	23.0	25.0	43.5	18.5	100	67
10	359.997	32.7	16.6	8.6	22.7	35.2	46.0	10.8	308	236
11	396.555	27.8	18.2	8.8	22.8	32.0	46.0	14.0	100	285
12	432.076	32.6	18.3	9.1	22.7	37.3	46.0	8.7	114	227

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

Radiated Spurious Emission(DSSS and other forms of modulation)

DATA OF RADIATED EMISSION TEST

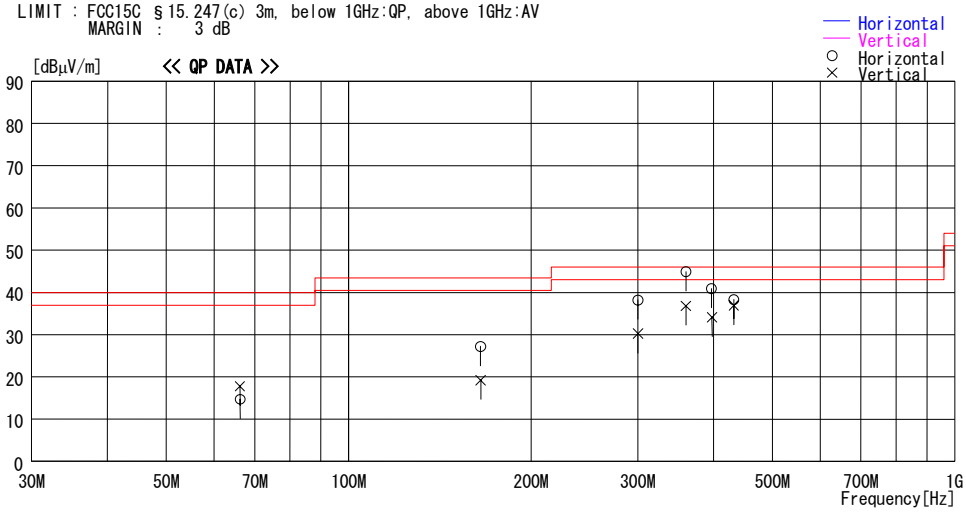
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/05/12 23:46:01

Applicant : SATO CORPORATION
Kind of EUT : Wireless LAN SiP Module
Model No. : WM-B-AG-02
Serial No. : 03UT02481658

Report No. : 24GE0192-HO
Power : DC3.3V
Temp℃/Humi% : 26℃ / 42%
Operator : Kenichi Adachi

Mode / Remarks : 30M-1GHz_Tx 2462 DATA PANA X-Axis

LIMIT : FCC15C §15.247(c) 3m, below 1GHz:QP, above 1GHz:AV
MARGIN : 3 dB



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	66.173	23.6	7.3	6.9	23.1	14.7	40.0	25.3	382	112
2	164.998	27.4	15.4	7.6	23.2	27.2	43.5	16.3	187	173
3	299.994	32.4	20.3	8.3	22.8	38.2	46.0	7.8	126	159
4	360.000	42.4	16.6	8.6	22.7	44.9	46.0	1.1	100	188
5	396.595	36.7	18.2	8.8	22.8	40.9	46.0	5.1	100	222
6	432.079	33.6	18.3	9.1	22.7	38.3	46.0	7.7	100	222
----- Vertical ------										
7	66.173	26.7	7.3	6.9	23.1	17.8	40.0	22.2	100	185
8	165.282	19.3	15.5	7.6	23.2	19.2	43.5	24.3	259	360
9	299.996	24.4	20.3	8.3	22.8	30.2	46.0	15.8	186	240
10	360.000	34.3	16.6	8.6	22.7	36.8	46.0	9.2	286	244
11	398.011	29.9	18.2	8.8	22.8	34.1	46.0	11.9	100	182
12	432.082	32.2	18.3	9.1	22.7	36.9	46.0	9.1	131	226

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

Radiated Spurious Emission(DSSS and other forms of modulation)

DATA OF SPURIOUS EMISSIONS(1GHz to 26GHz)

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

Company : SATO Corporation
Equipment : Wireless LAN SiP Module
Model : WM-B-AG-02
Sample No. : 03UT02481658
Power : DC 3.3V
Mode : Transmitting (IEEE 802.11b) , Main Antenna
: Continuous Tx mode, QPSK, 11Mbps
: CH1: 2412MHz

REPORT NO : 24GE0192-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)
TEST DISTANCE : 3/1m
DATE : Apr 20, 2004
TEMPERATURE : 26deg.C
HUMIDITY : 42%
ENGINEER : Kenichi Adachi

PK DETECT (RBW & VBW 1MHz)

No.	FREQ	T/R READING		ANT	AMP	CABLE	ATT or	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV/m]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	2390.0	42.2	41.7	30.8	36.3	6.2	9.8	52.7	52.2	74.0	21.3	21.8
2	4824.0	44.2	43.0	35.4	36.1	9.0	1.0	53.5	52.3	74.0	20.5	21.7
3	7236.0	40.3	41.8	38.0	35.6	11.2	0.5	54.4	55.9	74.0	19.6	18.1
4	9648.0	41.2	40.8	37.5	36.3	12.9	0.5	55.8	55.4	74.0	18.2	18.6
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12060.0	41.5	41.3	41.1	35.7	14.4	0.5	52.3	52.1	74.0	21.7	21.9
6	14472.0	40.3	40.3	41.0	34.6	15.3	0.6	53.1	53.1	74.0	20.9	20.9
7	16884.0	43.3	43.2	46.0	35.5	17.3	0.4	62.0	61.9	74.0	12.0	12.1
8	19296.0	44.7	44.6	39.6	34.9	18.7	0.9	59.5	59.4	74.0	14.5	14.6
9	21708.0	44.1	44.0	40.7	35.3	20.0	0.6	60.6	60.5	74.0	13.4	13.5
10	24120.0	43.1	43.0	40.0	36.0	20.7	1.6	59.9	59.8	74.0	14.1	14.2

AV DETECT (RBW 1MHz VBW 10Hz)

No.	FREQ	T/R READING		ANT	AMP	CABLE	ATT or	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV/m]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	2390.0	32.2	31.7	30.8	36.3	6.2	9.8	42.7	42.2	54.0	11.3	11.8
2	4824.0	32.7	32.1	35.4	36.1	9.0	1.0	42.0	41.4	54.0	12.0	12.6
3	7236.0	29.4	29.5	38.0	35.6	11.2	0.5	43.5	43.6	54.0	10.5	10.4
4	9648.0	30.0	30.0	37.5	36.3	12.9	0.5	44.6	44.6	54.0	9.4	9.4
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12060.0	30.6	30.5	41.1	35.7	14.4	0.5	41.4	41.3	54.0	12.6	12.7
6	14472.0	29.5	29.7	41.0	34.6	15.3	0.6	42.3	42.5	54.0	11.7	11.5
7	16884.0	32.5	32.5	46.0	35.5	17.3	0.4	51.2	51.2	54.0	2.8	2.8
8	19296.0	32.1	32.3	39.6	34.9	18.7	0.9	46.9	47.1	54.0	7.1	6.9
9	21708.0	32.4	32.2	40.7	35.3	20.0	0.6	48.9	48.7	54.0	5.1	5.3
10	24120.0	32.1	32.1	40.0	36.0	20.7	1.6	48.9	48.9	54.0	5.1	5.1

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit values at frequencies excepting restricted bands indicated in 15.205 are values 20dB below lower

Radiated Spurious Emission(DSSS and other forms of modulation)
DATA OF SPURIOUS EMISSIONS(1GHz to 26GHz)

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

Company : SATO Corporation
Equipment : Wireless LAN SiP Module
Model : WM-B-AG-02
Sample No. : 03UT02481658
Power : DC 3.3V
Mode : Transmitting (IEEE 802.11b) , Main Antenna
: Continuous Tx mode, QPSK, 11Mbps
: CH6: 2437MHz

REPORT NO : 24GE0192-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)
TEST DISTANCE : 3/1m
DATE : Apr 20, 2004
TEMPERATURE : 26deg.C
HUMIDITY : 42%
ENGINEER : Kenichi Adachi

PK DETECT (RBW & VBW 1MHz)

No.	FREQ	T/R READING		ANT	AMP	CABLE	ATT or Filter	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS		HOR	VER	PK	HOR	VER
	[MHz]	[dBuV/m]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	4874.0	42.3	44.0	35.6	36.1	9.1	1.0	51.9	53.6	74.0	22.1	20.4
2	7311.0	39.4	39.7	38.1	35.7	11.2	0.5	53.5	53.8	74.0	20.5	20.2
3	9748.0	40.3	41.9	37.3	36.3	12.9	0.5	54.7	56.3	74.0	19.3	17.7
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
4	12185.0	40.8	40.7	41.4	35.6	14.4	0.5	52.0	51.9	74.0	22.0	22.1
5	14622.0	40.0	40.5	41.5	34.8	15.5	0.6	53.3	53.8	74.0	20.7	20.2
6	17059.0	44.0	44.3	46.4	35.4	17.4	0.4	63.3	63.6	74.0	10.7	10.4
7	19496.0	43.5	43.3	39.2	34.9	18.8	1.0	58.1	57.9	74.0	15.9	16.1
8	21933.0	43.6	43.6	40.5	35.0	20.2	0.9	60.7	60.7	74.0	13.3	13.3
9	24370.0	44.2	44.5	40.1	36.6	20.8	2.2	61.2	61.5	74.0	12.8	12.5

AV DETECT (RBW 1MHz VBW 10Hz)

No.	FREQ	T/R READING		ANT	AMP	CABLE	ATT or Filter	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS		HOR	VER	AV	HOR	VER
	[MHz]	[dBuV/m]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	4874.0	33.3	36.1	35.6	36.1	9.1	1.0	42.9	45.7	54.0	11.1	8.3
2	7311.0	30.0	30.0	38.1	35.7	11.2	0.5	44.1	44.1	54.0	9.9	9.9
3	9748.0	30.5	30.4	37.3	36.3	12.9	0.5	44.9	44.8	54.0	9.1	9.2
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
4	12185.0	30.2	30.1	41.4	35.6	14.4	0.5	41.4	41.3	54.0	12.6	12.7
5	14622.0	29.6	29.5	41.5	34.8	15.5	0.6	42.9	42.8	54.0	11.1	11.2
6	17059.0	32.3	32.3	46.4	35.4	17.4	0.4	51.6	51.6	54.0	2.4	2.4
7	19496.0	32.2	32.6	39.2	34.9	18.8	1.0	46.8	47.2	54.0	7.2	6.8
8	21933.0	31.7	32.4	40.5	35.0	20.2	0.9	48.8	49.5	54.0	5.2	4.5
9	24370.0	33.0	33.1	40.1	36.6	20.8	2.2	50.0	50.1	54.0	4.0	3.9

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit values at frequencies excepting restricted bands indicated in 15.205 are values 20dB below lower

Radiated Spurious Emission(DSSS and other forms of modulation)

DATA OF SPURIOUS EMISSIONS(1GHz to 26GHz)

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

Company : SATO Corporation
Equipment : Wireless LAN SiP Module
Model : WM-B-AG-02
Sample No. : 03UT02481658
Power : DC 3.3V
Mode : Transmitting (IEEE 802.11b) , Main Antenna
: Continuous Tx mode, QPSK, 11Mbps
: CH11: 2462MHz

REPORT NO : 24GE0192-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)
TEST DISTANCE : 3/1m
DATE : Apr 20, 2004
TEMPERATURE : 26deg.C
HUMIDITY : 42%
ENGINEER : Kenichi Adachi

PK DETECT (RBW & VBW 1MHz)

No.	FREQ	T/R READING		ANT	AMP	CABLE	ATT or	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV/m]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	2483.5	44.3	44.6	31.0	36.2	6.3	9.8	55.2	55.5	74.0	18.8	18.5
2	4924.0	43.4	45.5	35.9	36.1	9.1	1.0	53.3	55.4	74.0	20.7	18.6
3	7386.0	41.0	41.4	38.3	35.7	11.3	0.5	55.4	55.8	74.0	18.6	18.2
4	9848.0	42.0	41.8	37.1	36.3	13.0	0.5	56.3	56.1	74.0	17.7	17.9
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12310.0	40.6	40.5	41.7	35.6	14.5	0.5	52.2	52.1	74.0	21.8	21.9
6	14772.0	41.0	40.9	42.1	34.9	15.6	0.6	54.9	54.8	74.0	19.1	19.2
7	17234.0	43.1	43.3	46.7	35.3	17.5	0.3	62.8	63.0	74.0	11.2	11.0
8	19696.0	44.2	45.0	39.6	35.4	18.9	1.0	58.8	59.6	74.0	15.2	14.4
9	22158.0	44.3	45.4	40.6	35.0	20.2	1.4	62.0	63.1	74.0	12.0	10.9
10	24620.0	45.8	46.3	40.2	36.8	20.9	2.6	63.2	63.7	74.0	10.8	10.3

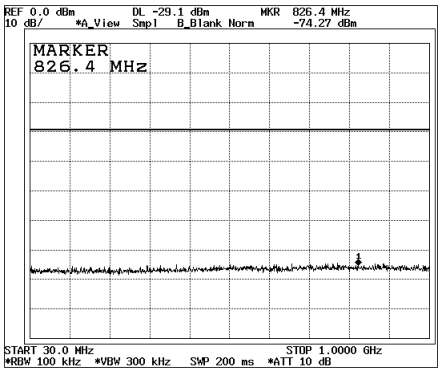
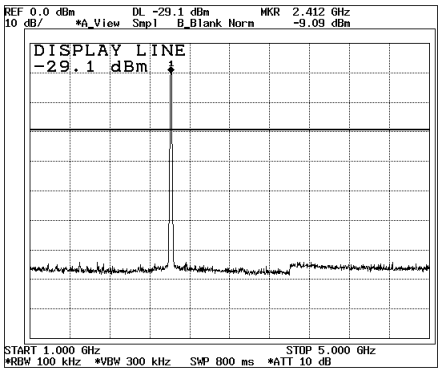
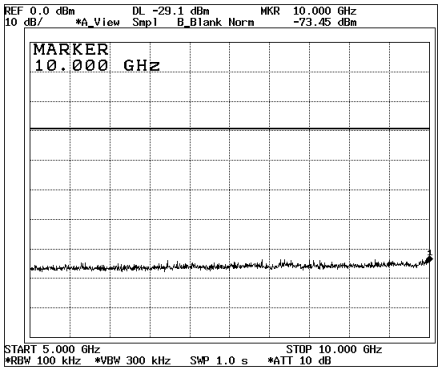
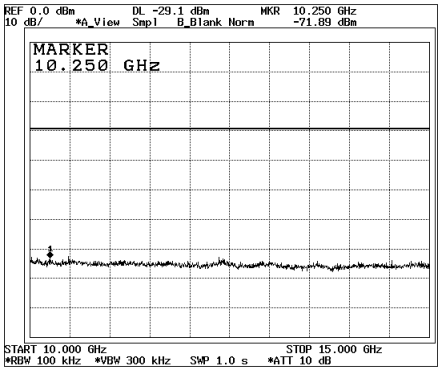
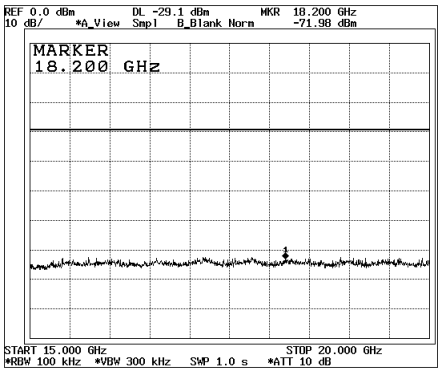
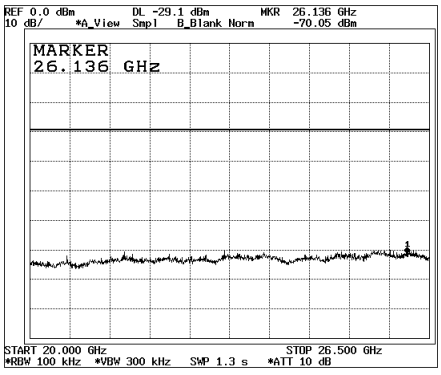
AV DETECT (RBW 1MHz VBW 10Hz)

No.	FREQ	T/R READING		ANT	AMP	CABLE	ATT or	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV/m]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	2483.5	33.0	33.2	31.0	36.2	6.3	9.8	43.9	44.1	54.0	10.1	9.9
2	4924.0	34.4	38.2	35.9	36.1	9.1	1.0	44.3	48.1	54.0	9.7	5.9
3	7386.0	30.2	30.1	38.3	35.7	11.3	0.5	44.6	44.5	54.0	9.4	9.5
4	9848.0	31.0	31.1	37.1	36.3	13.0	0.5	45.3	45.4	54.0	8.7	8.6
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12310.0	29.9	29.8	41.7	35.6	14.5	0.5	41.5	41.4	54.0	12.5	12.6
6	14772.0	29.1	29.0	42.1	34.9	15.6	0.6	43.0	42.9	54.0	11.0	11.1
7	17234.0	32.3	32.1	46.7	35.3	17.5	0.3	52.0	51.8	54.0	2.0	2.2
8	19696.0	32.8	32.7	39.6	35.4	18.9	1.0	47.4	47.3	54.0	6.6	6.7
9	22158.0	32.8	32.5	40.6	35.0	20.2	1.4	50.5	50.2	54.0	3.5	3.8
10	24620.0	33.8	33.9	40.2	36.8	20.9	2.6	51.2	51.3	54.0	2.8	2.7

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit values at frequencies excepting restricted bands indicated in 15.205 are values 20dB below lower
(PK:88.1dBuV/AV:83.5dBuV) peak output powers (PK:108.1dBuV/AV:103.5dBuV) at each channe ⇒今回は必要なし

Conducted Spurious Emission(DSSS and other forms of modulation)

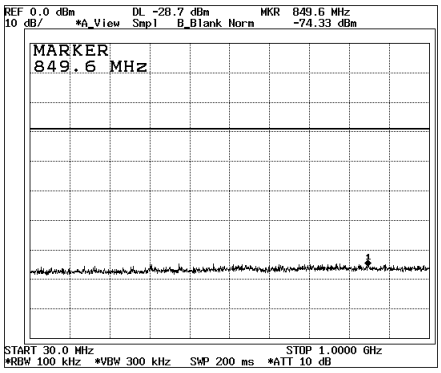
Ch : Low

30MHz-1GHz	1GHz-5GHz
	
5GHz-10GHz	**10GHz-15GHz**
	
15GHz-20GHz	**20GHz-26.5GHz**
	

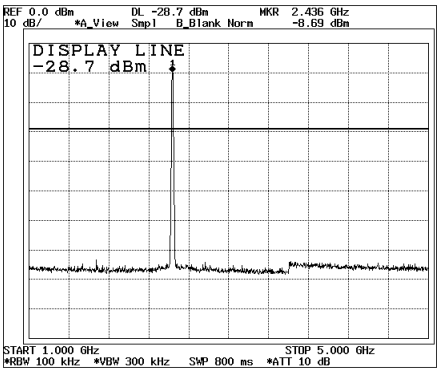
Conducted Spurious Emission(DSSS and other forms of modulation)

Ch : Mid

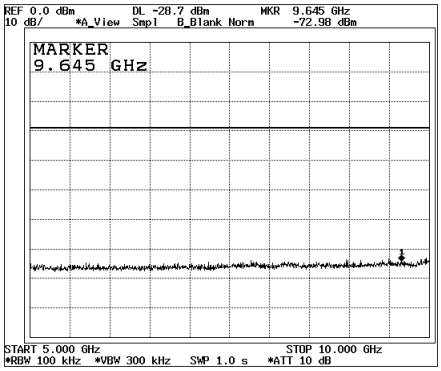
30MHz-1GHz



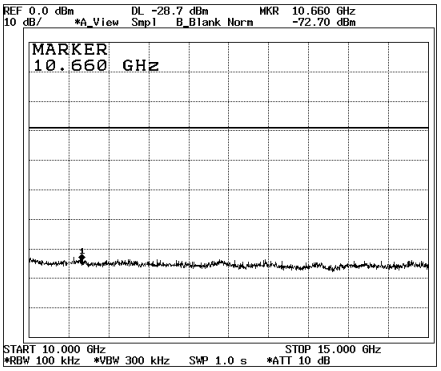
1GHz-5GHz



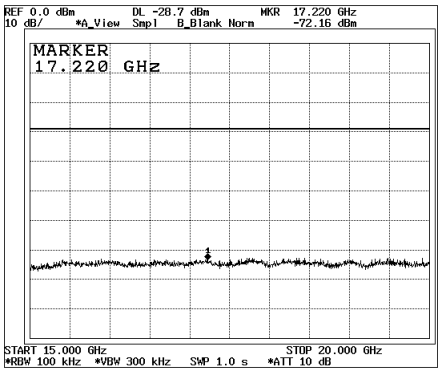
5GHz-10GHz



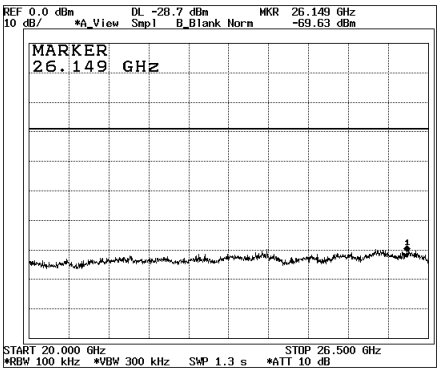
10GHz-15GHz



15GHz-20GHz

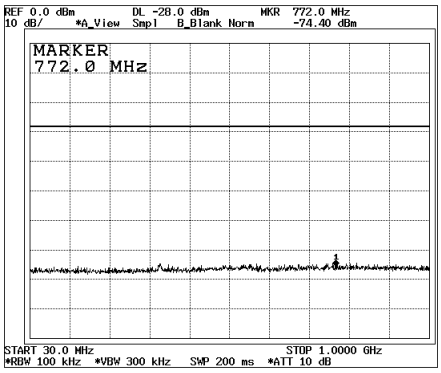
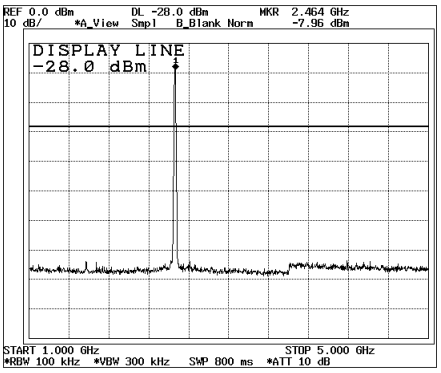
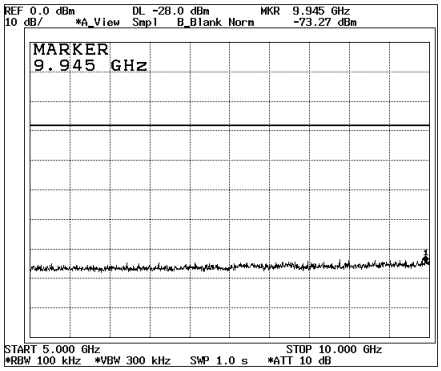
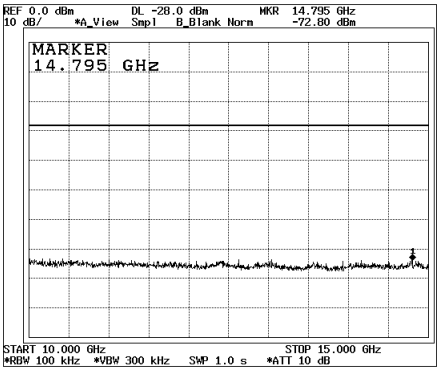
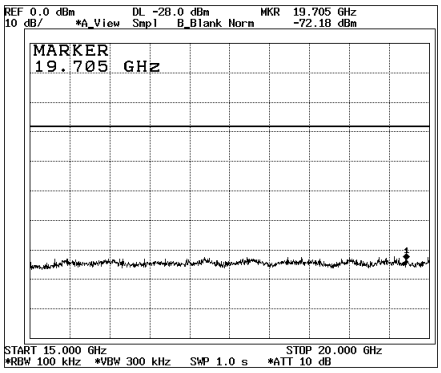
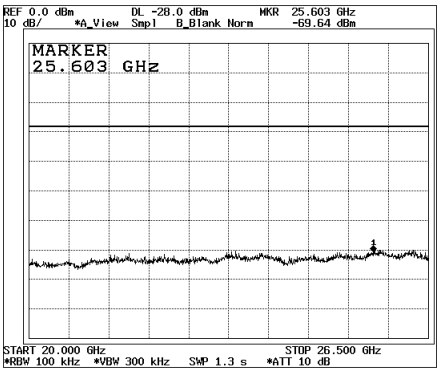


20GHz-26.5GHz



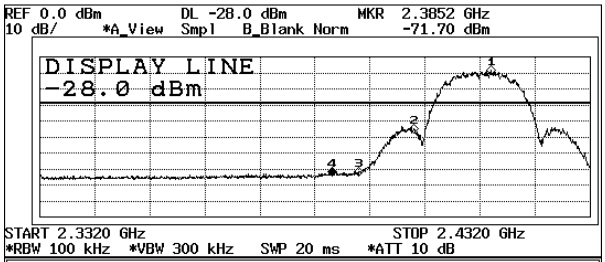
Conducted Spurious Emission(DSSS and other forms of modulation)

Ch : High

30MHz-1GHz	1GHz-5GHz
	
5GHz-10GHz	**10GHz-15GHz**
	
15GHz-20GHz	**20GHz-26.5GHz**
	

Conducted emission Band Edge compliance (DSSS and other forms of modulation)

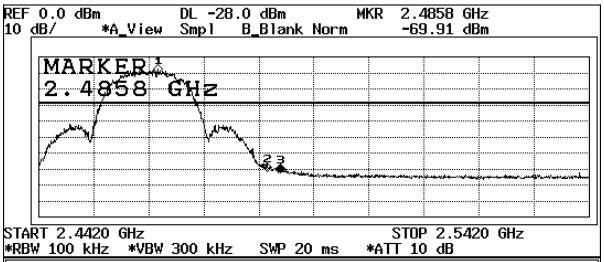
ch1 : Low



Multi Marker List

1:	2.4139 GHz	-8.02 dBm
2:	2.4000 GHz	-44.68 dBm
3:	2.3900 GHz	-71.77 dBm
4:	2.3852 GHz	-71.70 dBm
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

Ch11 : High



Multi Marker List

1:	2.4637 GHz	-7.52 dBm
2:	2.4835 GHz	-69.15 dBm
3:	2.4858 GHz	-69.91 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

Power Density (DSSS and other forms of modulation)

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

COMPANY	: SATO CORPORATION	REGULATION	: Fcc Part15 Subpart C 15.247(d)
QUIPMENT	: W-LAN module for W-LAN/BARCODE PRINTER	TEST DISTANCE	: -
MODEL	: WM-B-AG-02	DATE	: March 11,2004
SAMPLE NO.	: 03UT02481658	TEMPERATURE	: 21 deg.C
POWER	: DC 3.3V (AC120V/60Hz)	HUMIDITY	: 46 %
MODE	: Transmitting (IEEE 802.11b) Burst Frame mode	ENGINEER	: Kenichi Adachi
	: 11Mbps		

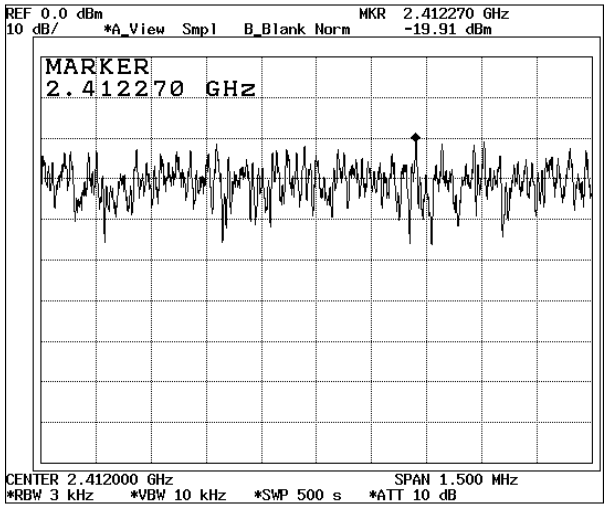
Ch	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
ch1	2412.3	-19.91	0.8	10.0	-9.1	8.0	17.1
ch6	2437.3	-20.75	0.8	10.0	-10.0	8.0	18.0
ch11	2462.3	-19.82	0.8	10.0	**-9.0**	8.0	**17.0**

Sample Calculation:
Result = Reading + Cable Loss + Attenuator
* Atten. was not used for factor 0.0dB of the above table.

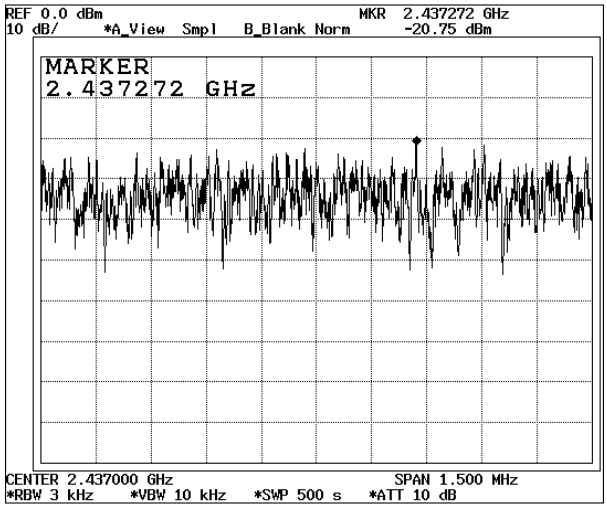
Test Instruments : MRENT-09, MAT-20
Remarks : This item was measured with cable that borrowed from the applicant. (Cable loss: 0.8dB)

Power Density(DSSS and other forms of modulation)

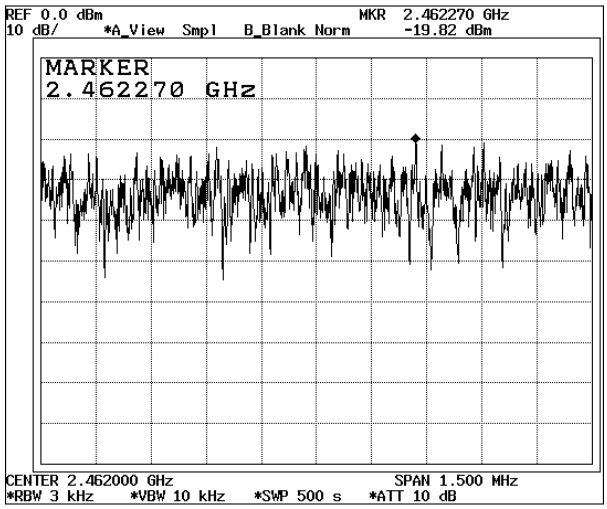
Ch1 : Low



Ch6 : Mid



Ch11 : High



99%Occupied Bandwidth(DSSS and other forms of modulation)

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

Company	: SATO CORPORATION	REPORT NO	: 24GE0192-HO
Equipment	: W-LAN module for W-LAN/BARCODE PRINTER	REGULATION	: RSS-210 (issue 5)
Model	: WM-B-AG-02	TEST DISTANCE	: -
Sample No.	: 03UT02481658	DATE	: March 11,2004
Power	: DC 3.3V (AC120V/60Hz)	TEMPERATURE	: 21 deg.C
Mode	: Transmitting (IEEE 802.11b) Burst Frame mode	HUMIDITY	: 46 %
	: 11Mbps		
		ENGINEER	: Kenichi Adachi

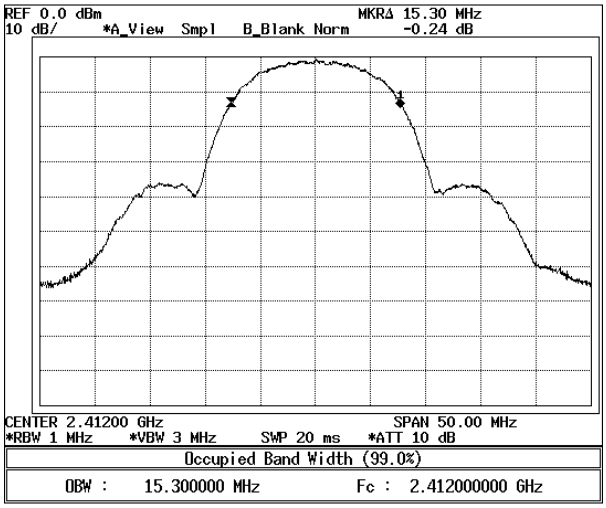
IEEE802.11b, Rate: 11Mbps

ch	FREQ [MHz]	99% Occupied Bandwidth [MHz]
Low(1)	2412.0	15.30
Mid(6)	2437.0	**15.35**
High(11)	2462.0	15.30

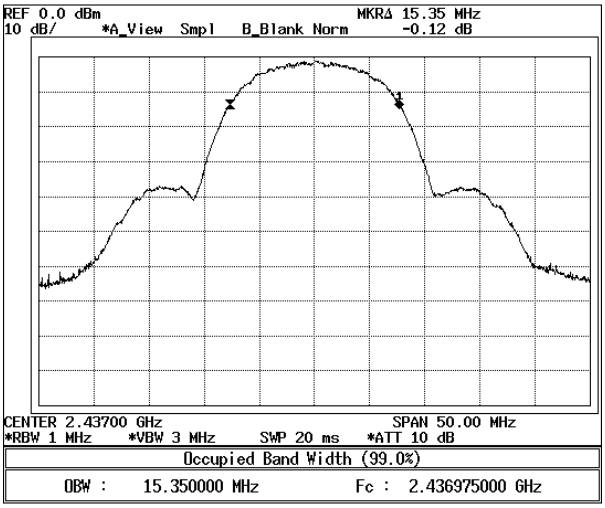
Test Instruments: MRENT-09, MAT-20

99% Occupied Bandwidth

Ch1 : Low



Ch6 : Mid



Ch11 : High