



EMI TEST REPORT

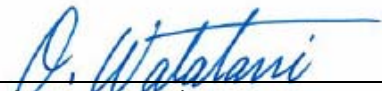
Test Report No. : 25IE0043-YK-1

Applicant : TOYOTA INDUSTRIES CORPORATION
Type of Equipment : Wireless LAN Module
Model No. : 6180210
FCC ID : M4B6180210
Test Standard : FCC Part15 Subpart C,
Section 15.207, Section 15.247: 2005
Test Result : Complied

1. This test report shall not be reproduced except in full, 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 test report are traceable to the national or international standards.

Date of test: April 19, 28 and May 6, 2005

Tested by: 
Toyokazu Imamura

Approved by: 
Osamu Watatani
Site Manager of Yamakita EMC Lab.

UL Apex Co., Ltd.

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MF060b(11.04.03)

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1 Applicant Information

Company Name : TOYOTA INDUSTRIES CORPORATION
Address : Hamamatsucho-Central Building 6F 1-29-6, Hamamatsu-cho, Minato-ku, Tokyo-to,
105-0013 JAPAN
Telephone Number : +81-3-5733-5019
Facsimile Number : +81-3-3432-0568
Contact Person : Hideki Fujii

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2 Product Description

Type of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Rating : DC3.3V
Country of Manufacture : Japan
Receipt Date of Sample : April 19, 2005
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

Model: 6180210 (referred to as the EUT in this report) is a Wireless LAN Module.

The clock frequency used in EUT: 44MHz (Local Oscillator)

Equipment type : Transceiver
Frequency of operation : 2412 - 2462 MHz
Bandwidth : 16 MHz
Channel spacing : 5 MHz
Channel number : 11 channels
Type of modulation : DSSS
Antenna type : Chip dielectric antenna
Antenna connector type : None
Antenna gain : 3.8dBi (Max.)
Mode of operation : Simplex
Emission Designation : G1D
Operation temperature range: -20 ~ 60 deg. C.

***FCC Part15.31 (e)**

Host device (PC) provides the Wireless LAN Module with stable power supply (DC3.3V), and the power is not changed when voltage of the PC is varied. Therefore, the equipment complies power supply regulation.

***FCC Part15.203**

The Wireless LAN Module and its antenna comply with this requirement since this antenna is built in the equipment and it cannot be replaced by end users.

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3 Test Specification, Procedures and Results

3.1 Test specification

Test specification : FCC Part15 Subpart C: 2005
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits: 2005
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
and 5725-5850MHz: 2005

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	Section 15.207	-	N/A	14.3dB (0.1954MHz, AV, Transmitting 2412MHz)	Complied
6dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (a)(2)	Conducted	N/A	*See data.	Complied
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (b)(3)	Conducted	N/A		Complied
Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (d)	Conducted/ Radiated	N/A	Radiated: 2.0dB (665.96MHz, QP, Horizontal, Transmitting 2412MHz)	Complied
Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (d)	Radiated	N/A	*See data.	Complied
Power Density	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (e)	Conducted	N/A		Complied

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

These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".

* No addition, exclusion nor deviation has been made from the standard.

3.3 Uncertainty

Conducted emission

The measurement uncertainty (with a 95% confidence level) for this test was ± 1.3 dB.

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

Radiated emission

The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is ± 4.8 dB.

The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB.

The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is ± 6.6 dB.

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

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3.4 Test Location

UL Apex Co., Ltd. Yamakita EMC Lab.
907, Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken 258-0124 JAPAN
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 September 20, 2002 (Registration No.: 95486).
IC Registration No. : IC3489

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. : IC3489-2

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on November 8, 2002 (Registration No.: 95967).
IC Registration No. : IC3489-B

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 EMS lab. (Semi-anechoic chamber)	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5		
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.

Test mode: Transmitting mode
- Low channel : 2412MHz
- Middle channel : 2437MHz
- High channel : 2462MHz

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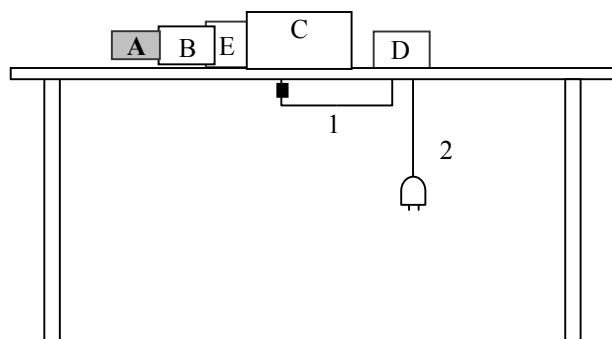
Facsimile: +81 465 77 2112

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4.2 Configuration of Tested System

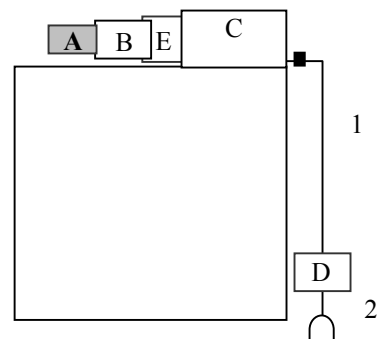
■: Ferrite core (Standard attachment of PC)

Front View (Conducted emission)



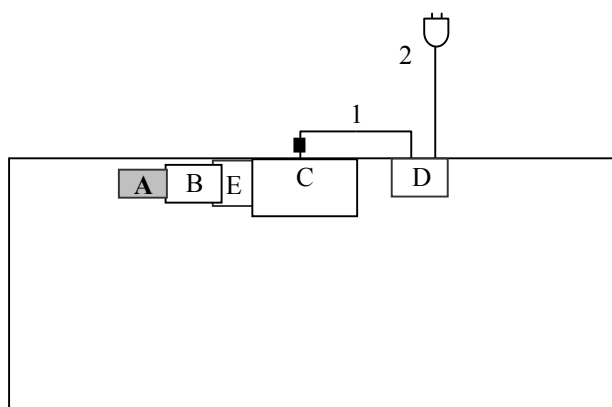
AC120V/60Hz

Front View (Radiated emission)

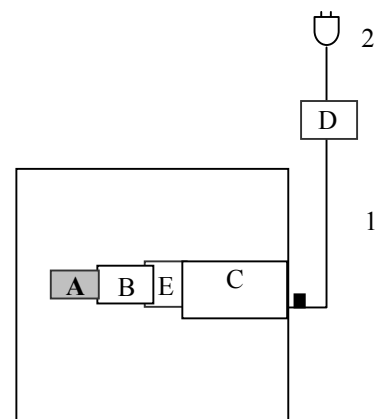


AC120V/60Hz

Top View (Conducted emission)



Top View (Radiated emission)



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remarks)
A	Wireless LAN Module	6180210	ES0021	TOYOTA INDUSTRIES CORPORATION	M4B6180210 (EUT)
B	PC Card Adapter	WLI-CF-OP	E20725	BUFFALO	-
C	Notebook PC	X30 2672-12J	99TAH27	IBM	-
D	AC Adapter	02K6808	11S02K6808Z1Z3BG342MHT	IBM	-
E	Extend Board	-	-	-	(Test jig)

List of cables used

No.	Name	Length (m)	Shield	Backshell material	Remark
1	DC cable	1.9	Unshielded	Polyvinyl chloride	-
2	AC cable	1.0	Unshielded	Polyvinyl chloride	-

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5 Conducted Emissions

5.1 Operating environment

The test was carried out in a 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 EUT's host device (PC), including 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. I/O cable 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.

5.3 Test conditions

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

5.4 Test procedure

The EUT 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: 10kHz

5.5 Results

Summary of the test results : Pass
Test data : APPENDIX 2 Page 17 to 21

Date : May 6, 2005 Test engineer : Toyokazu Imamura

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6 6dB Bandwidth

Test Procedure

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

Summary of the test results: Pass

Date: May 6, 2005

Test data:

Test engineer :

APPENDIX 2 Page 22

Toyokazu Imamura

7 Maximum Peak Output Power

Test Procedure

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

Summary of the test results: Pass

Date: May 6, 2005

Test data:

Test engineer :

APPENDIX 2 Page 23 to 24

Toyokazu Imamura

8 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 6, 2005

Test data:

Test engineer :

APPENDIX 2 Page 25 to 30

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9 Out of Band Emissions (Radiated)

9.1 Operating environment

The test was carried out in an anechoic chamber.

9.2 Test configuration

EUT was placed on a 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.

9.3 Test conditions

Frequency range : 30MHz - 26GHz
Test distance : 3m
EUT operation mode : Transmitting

9.4 Test procedure

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m. 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.

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.

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

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

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

The equipment was 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 16.

With the position, the noise levels of all the frequencies were measured.

Frequency	Below 1GHz	Above 1GHz	
		Spurious	Fundamental
Antenna: Horizontal	X	Z	Z
Antenna: Vertical	Y	Z	X

9.5 Results

Summary of the test results : Pass
Test data : APPENDIX 2 Page 31 to 33 (30 - 1000MHz)
: APPENDIX 2 Page 34 to 39 (1 - 26GHz)
: APPENDIX 2 Page 40 to 43 (Band Edges: 2390MHz/ 2483.5MHz, Restricted band Charts)

Date : April 19, 28 and May 6, 2005

Test engineer : Toyokazu Imamura

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10 Peak Power Density (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 6, 2005

Test data:

Test engineer :

APPENDIX 2 Page 44 to 45

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APPENDIX 1: Photographs of test setup

Page 14	:	Conducted emission
Page 15	:	Radiated emission
Page 16	:	Pre check of worse-case position

APPENDIX 2: Test Data

Page 17 - 21	:	Conducted emission
Page 22	:	6dB Bandwidth
Page 23 - 24	:	Maximum Peak Output Power
Page 25 - 30	:	Out of Band Emissions (Antenna Port Conducted)
Page 31 - 43	:	Out of Band Emissions (Radiated)
31 - 33	:	30-1000MHz
34 - 39	:	1-26GHz
40 - 43	:	Restricted band edge
Page 44 - 45	:	Peak Power Density

APPENDIX 3: Test instruments

Page 46	:	Test instruments
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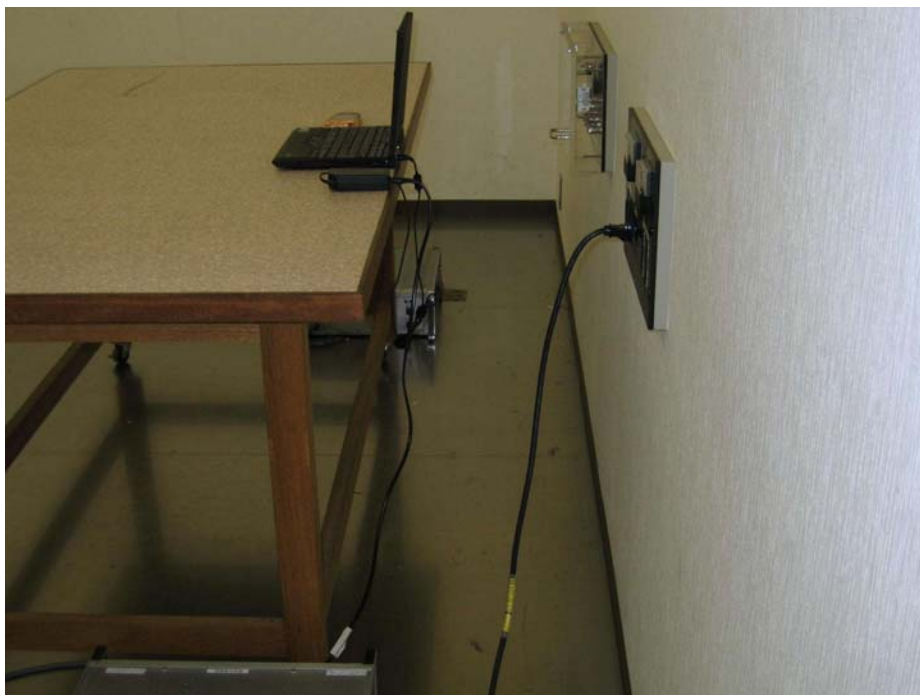
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Conducted emission



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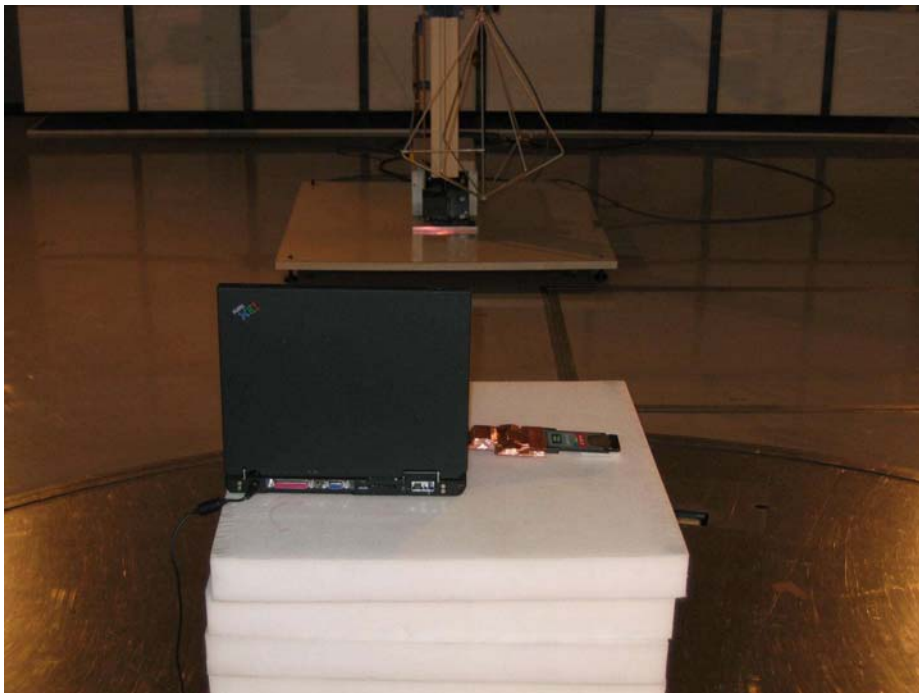
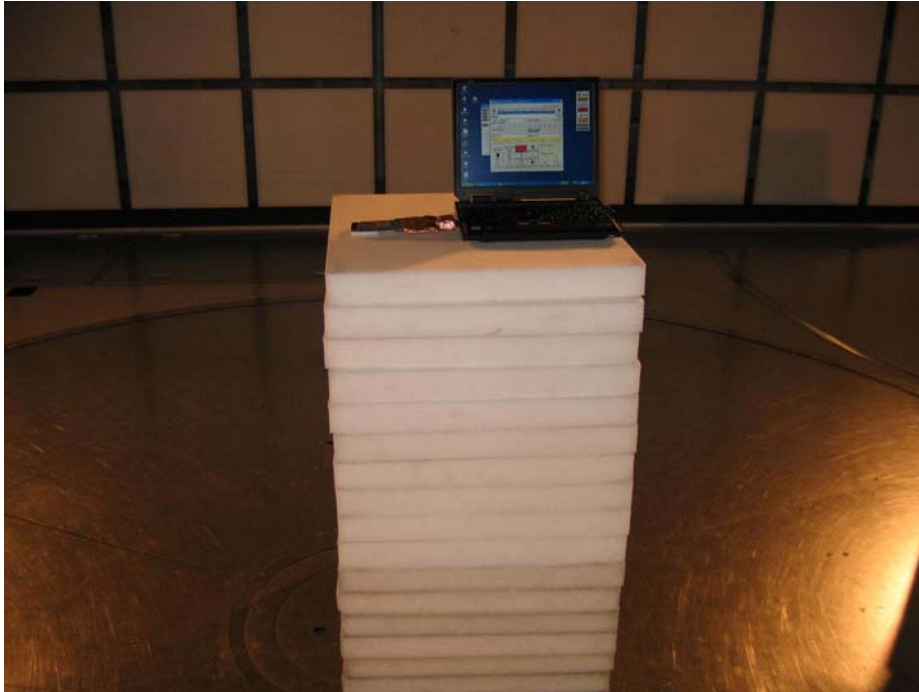
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Radiated emission



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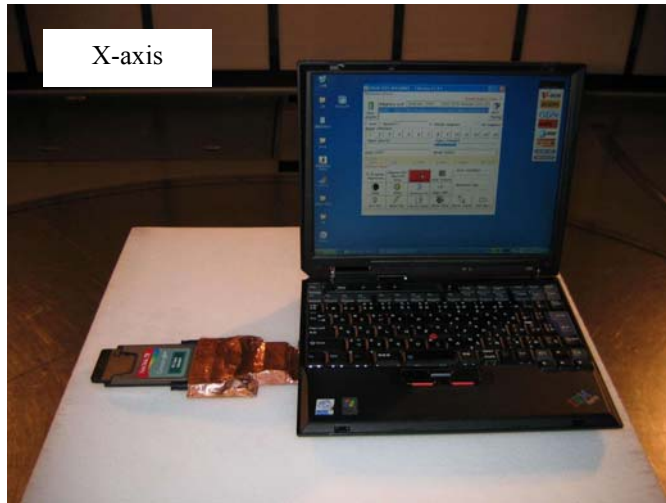
Telephone: +81 465 77 1011

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Pre check of worse-case position

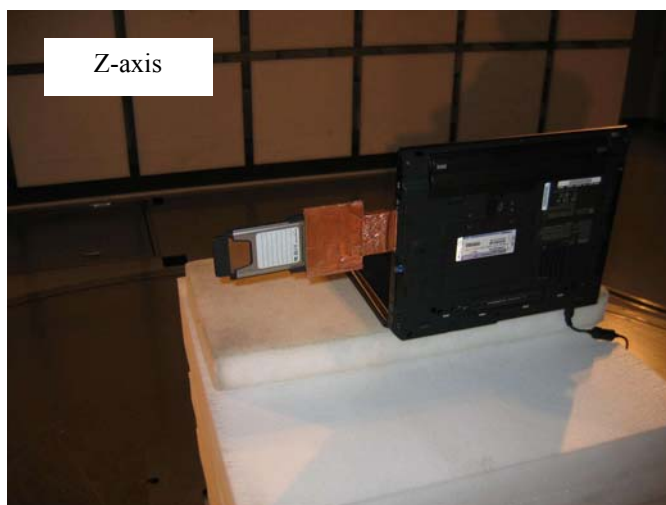
X-axis



Y-axis



Z-axis



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DATA OF CONDUCTION TEST

UL Apex Co.,Ltd.
YAMAKITA No.1 SHIELD TEST ROOM
Report No. : 25IE0043-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : AC120V/60Hz
Mode : Transmitting:ch1 (2412MHz)
Remarks :
Date : 5/6/2005
Phase : Single Phase
Temperature : 22 °C
Humidity : 47 %
Regulation : FCC Part15C § 15. 207. (CISPR Pub. 22)
Engineer : Toyokazu Imamura

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.	0.1954	45.2	37.9	45.7	39.4	0.0	0.1	0.0	45.8	39.5	63.8	53.8	18.0	14.3
2.	0.2597	37.9	-	37.4	-	0.0	0.1	0.0	38.0	-	61.4	51.4	23.4	-
3.	0.4544	28.5	-	30.0	-	0.0	0.2	0.0	30.2	-	56.8	46.8	26.6	-
4.	0.5189	28.6	-	28.6	-	0.0	0.2	0.0	28.8	-	56.0	46.0	27.2	-
5.	0.5834	27.9	-	28.4	-	0.0	0.2	0.0	28.6	-	56.0	46.0	27.4	-
6.	26.7244	24.0	-	23.2	-	0.7	1.9	0.0	26.6	-	60.0	50.0	33.4	-

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

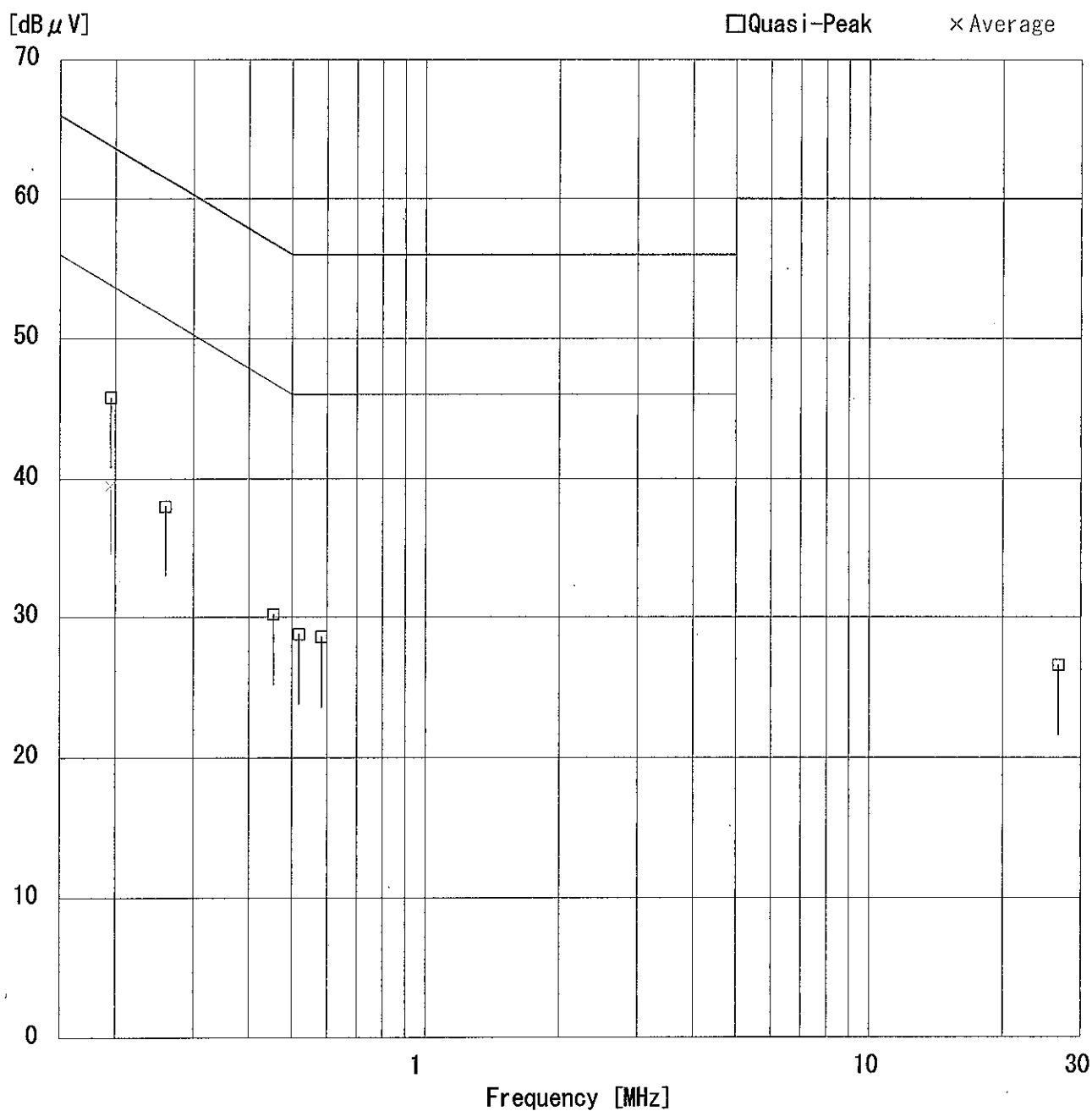
■ LISN : KLS-01 (NSLK8126) ■ COAXIAL CABLE : KCC-14/15/16/18
■ PULSE LIMITTER : KPL-01 (PL01) ■ EMI RECEIVER : KTR-02 (ESCS30)

DATA OF CONDUCTION TEST

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Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : AC120V/60Hz
Mode : Transmitting:ch1 (2412MHz)
Remarks :
Date : 5/6/2005
Phase : Single Phase
Temperature : 22 °C
Humidity : 47 %
Regulation : FCC Part15C § 15.207. (CISPR Pub.22)

Engineer : Toyokazu Imamura



DATA OF CONDUCTION TEST CHART

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YAMAKITA No.1 SHIELD TEST ROOM

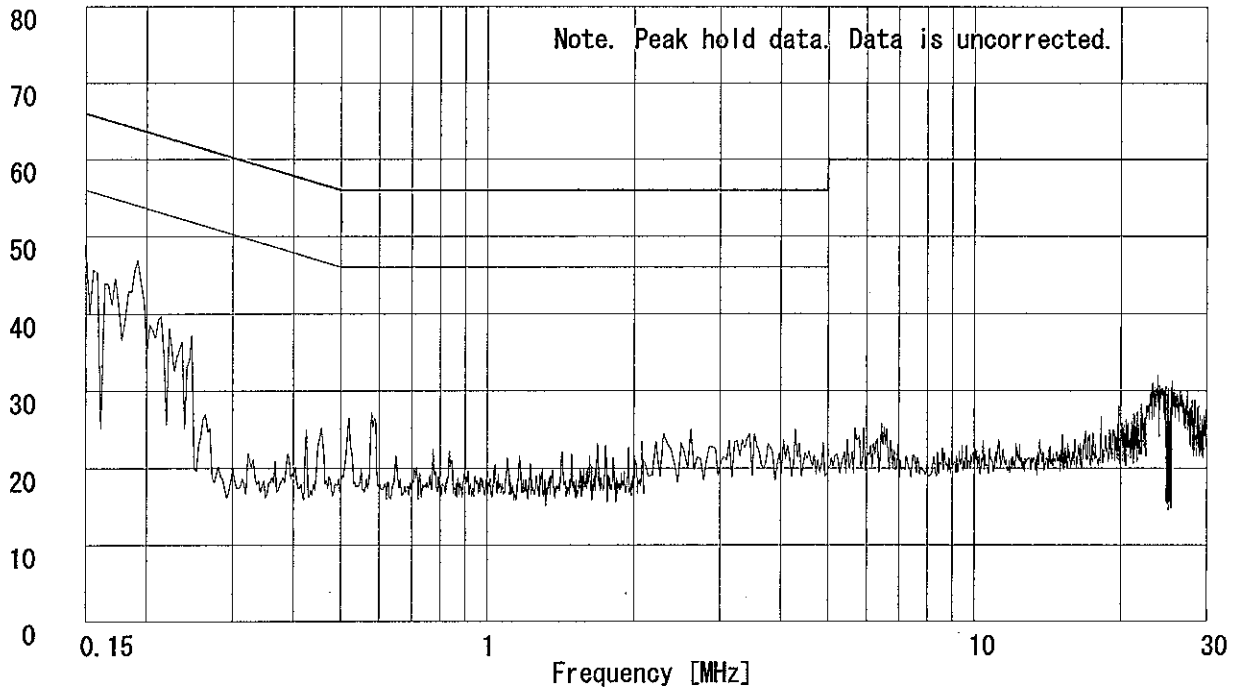
Report No. : 251E0043-YK - 1

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Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : AC120V/60Hz
Mode : Transmitting:ch1 (2412MHz)
Remarks :
Date : 5/6/2005
Phase : Single Phase
Temperature : 22 °C
Humidity : 47 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Toyokazu Imamura

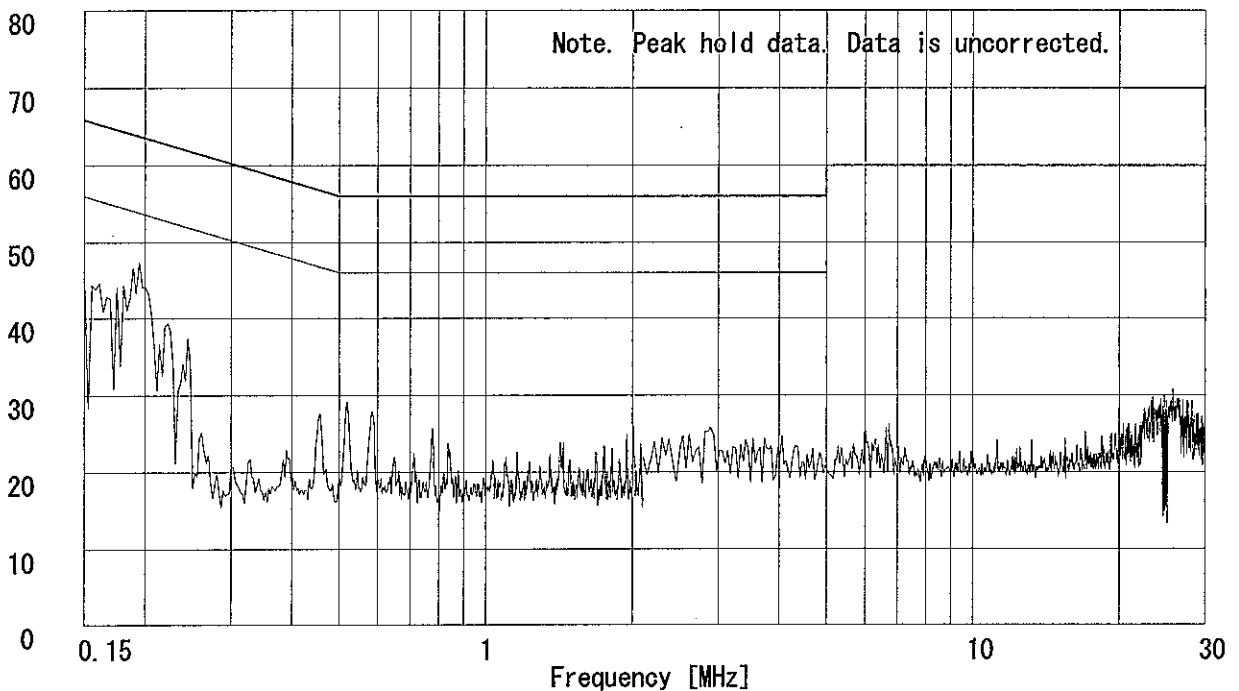
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

YAMAKITA No.1 SHIELD TEST ROOM

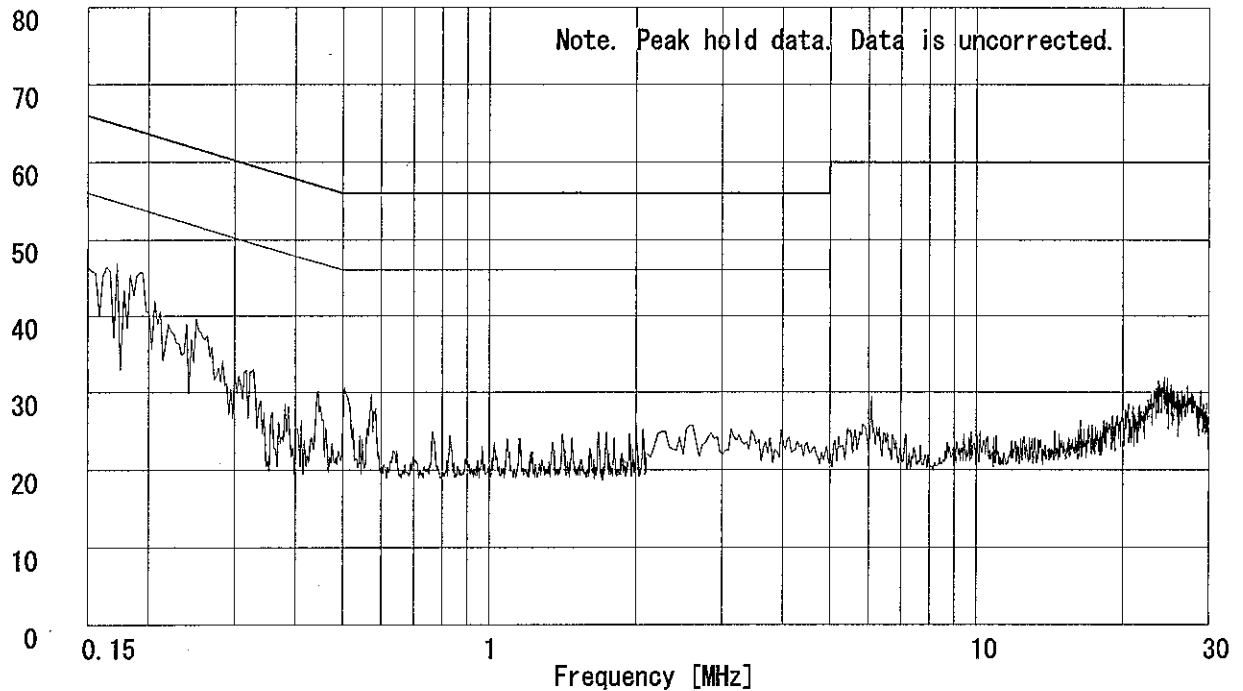
Report No. : 251E0043-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : AC120V/60Hz
Mode : Transmitting:ch6 (2437MHz)
Remarks :
Date : 5/6/2005
Phase : Single Phase
Temperature : 22 °C
Humidity : 47 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Toyokazu Imamura

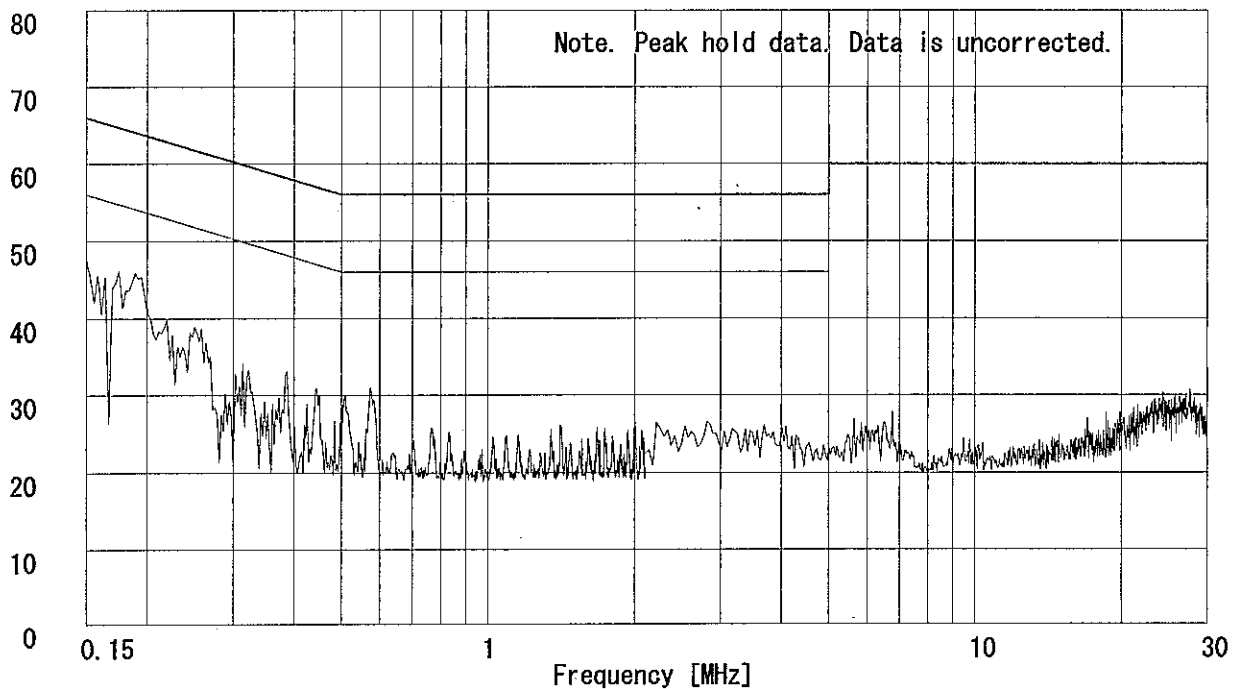
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

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YAMAKITA No.1 SHIELD TEST ROOM

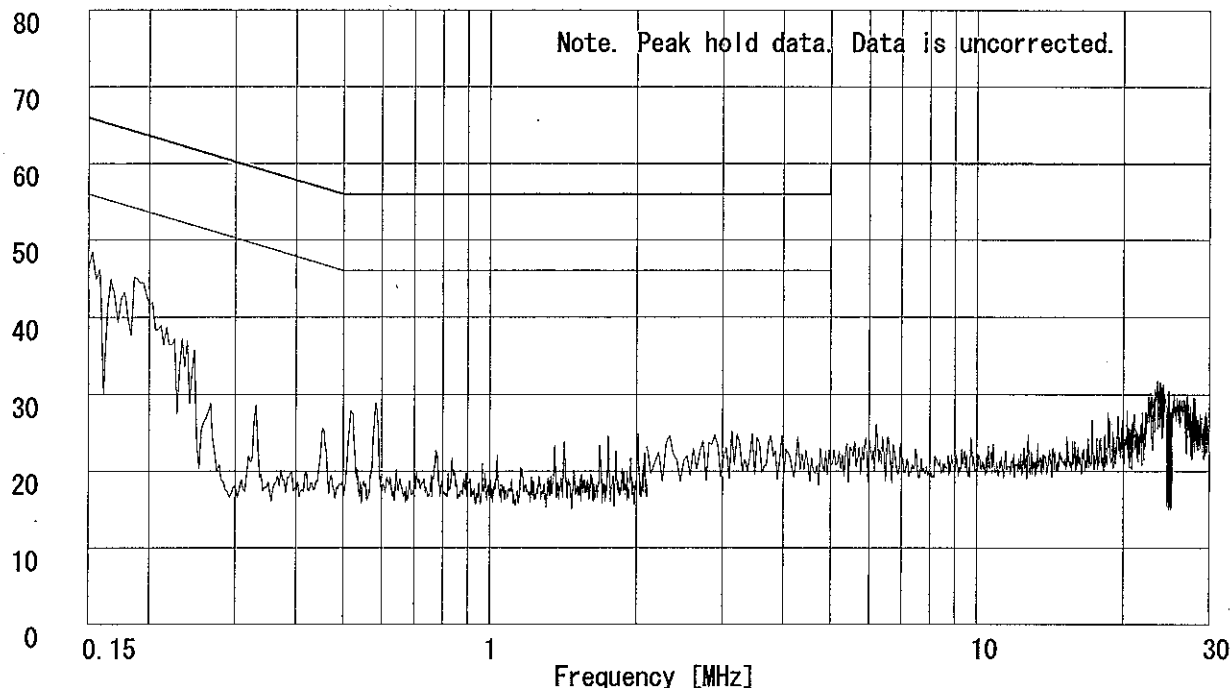
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Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : AC120V/60Hz
Mode : Transmitting:ch11 (2462MHz)
Remarks :
Date : 5/6/2005
Phase : Single Phase
Temperature : 22 °C
Humidity : 47 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Toyokazu Imamura

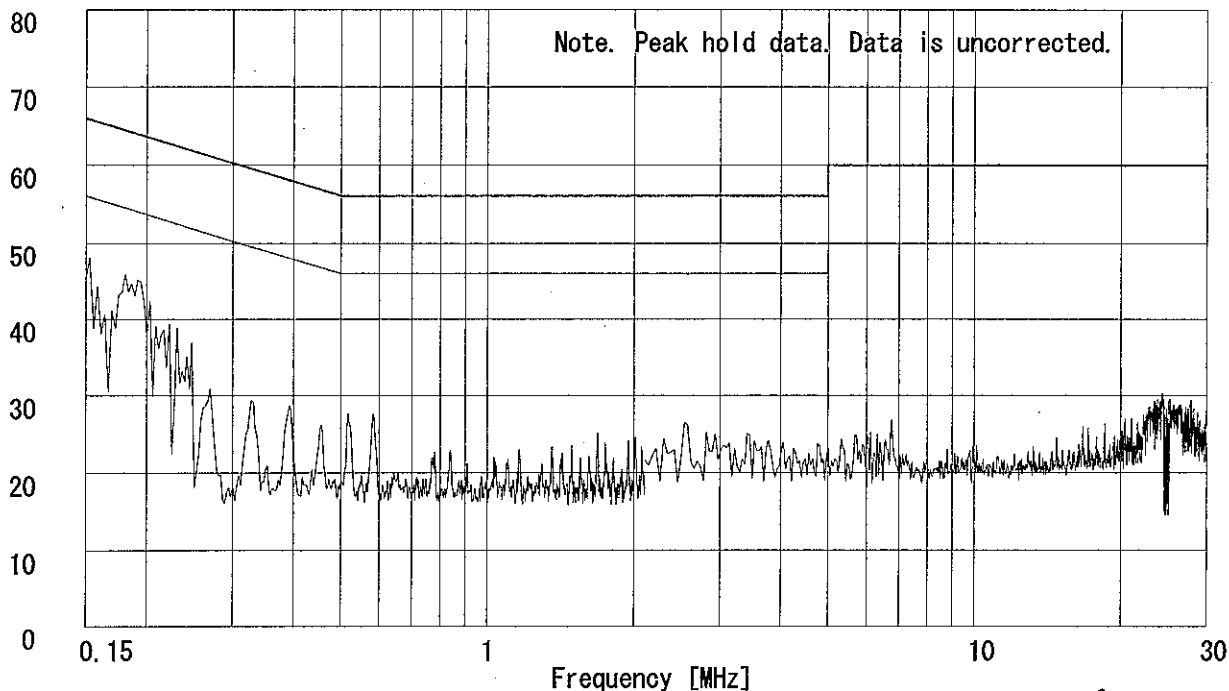
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



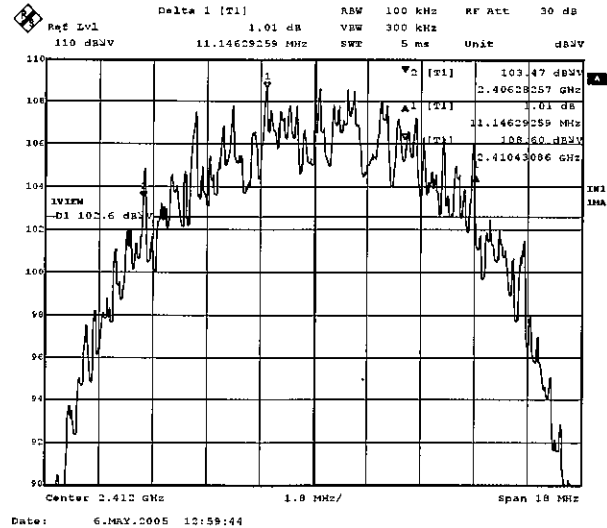
6dB Bandwidth: FCC 15.247(a)(2)

COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)

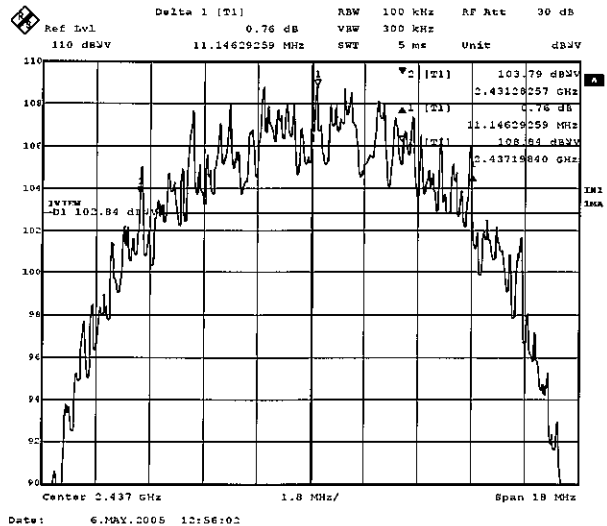
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(a)(2)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[IEEE802.11b(11Mbps)]

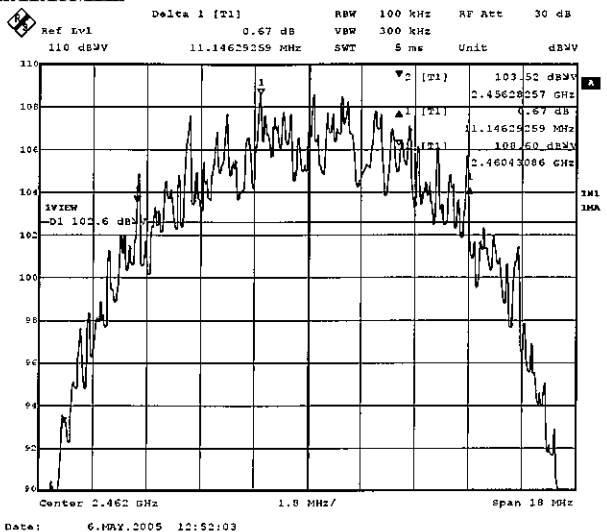
1. ch 1: 2412MHz/6dB Bandwidth:11.15MHz



2. ch 6: 2437MHz/6dB Bandwidth:11.15MHz



3. ch 11: 2462MHz/6dB Bandwidth:11.15MHz



Maximum Peak Conducted Output Power

UL Apex Co.,Ltd

YAMAKITA NO.2 Shielded Room

COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER : 6180210
SERIAL NUMBER : ES0021
FCC ID : M4B6180210
POWER : DC3.3V(PC:AC120V/60Hz)
TEST MODE : Transmitting

REPORT NO : 25IE0043-YK-1
REGULATION : Fcc Part15SubpartC 247(b)(3)
DATE : 2004/5/6
TEMP./HUMI : 25°C/46%

ENGINEER : Toyokazu Imamura

IEEE802.11b(11Mbps)

CH	FREQ [GHz]	S/A Reading [dBm]	Cable Loss [dB]	Results [dBm]	Limit (1W) [dBm]	MARGIN [dB]
Low	2412.00	18.32	0.60	18.92	30.0	11.08
Mid	2437.00	18.32	0.60	18.92	30.0	11.08
High	2462.00	18.61	0.60	19.21	30.0	10.79

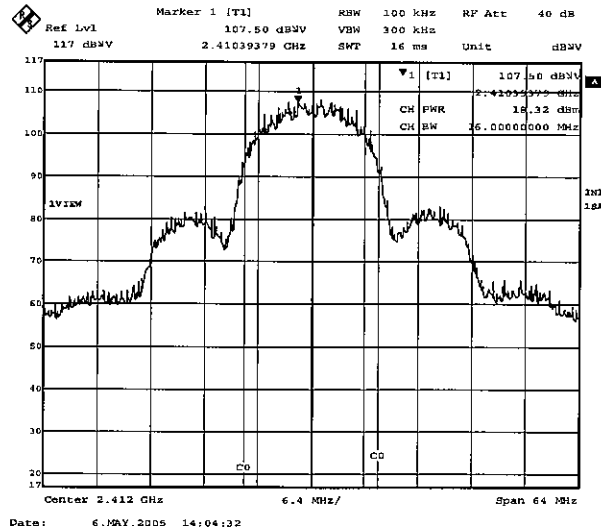
Maximum Peak Conducted Output Power: FCC 15.247(b)(3)

COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)

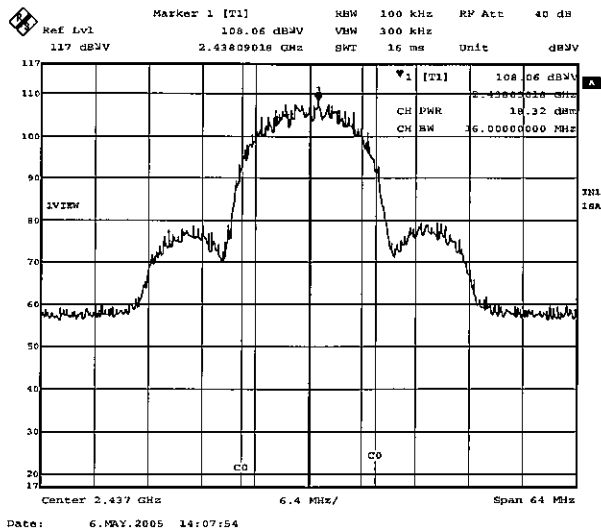
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 25IE0043-YK-1
REGULATION : Fcc Part15SubpartC 247(b)(3)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[Spectrum Analyzer data]

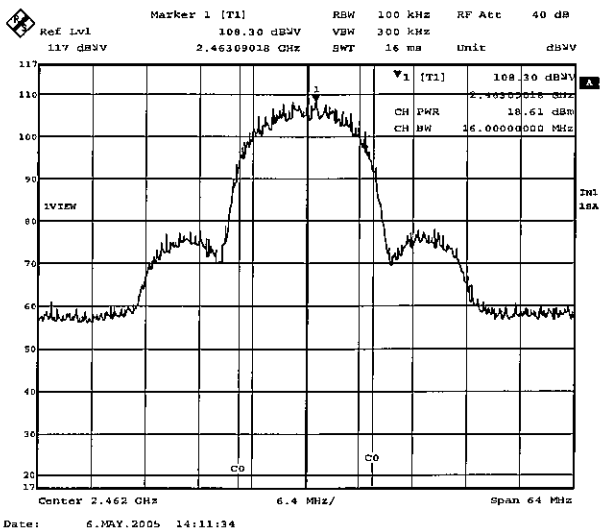
1. ch : 2412MHz



2. ch : 2437MHz



3. ch : 2462MHz



Out of Band Emission(Antenna Terminal Conducted): FCC 15.247(d)

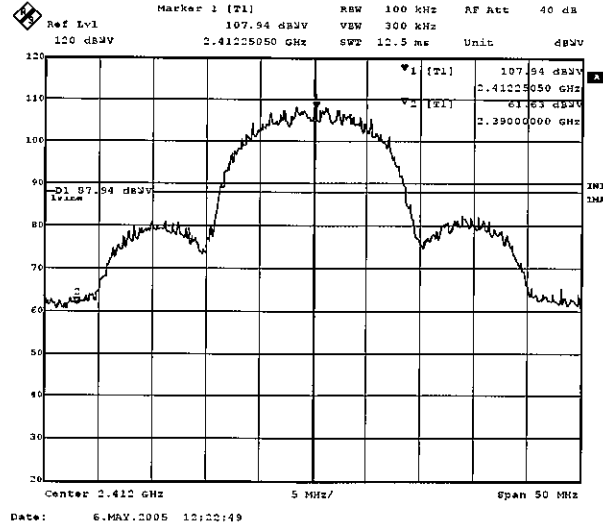
COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)

REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

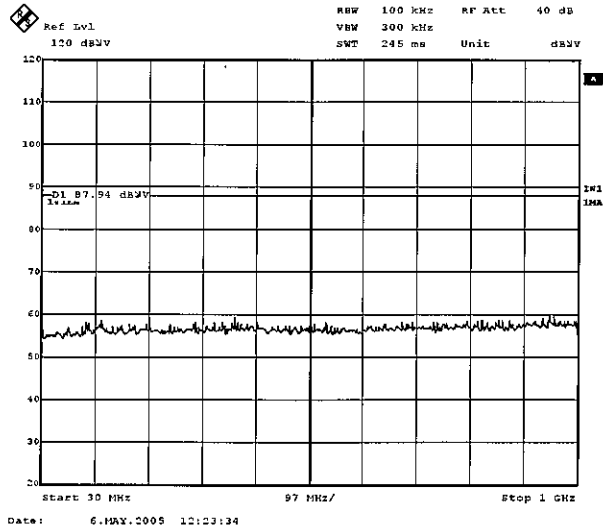
[IEEE802.11b(11Mbps)]

Ch1:2412MHz

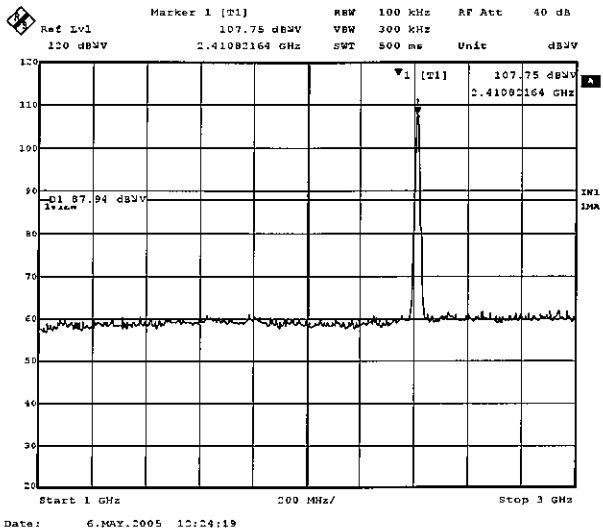
1.



2.



3.

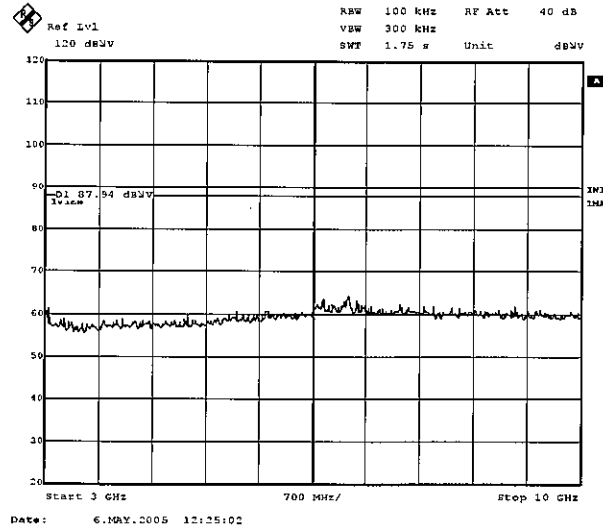


Out of Band Emission(Antenna Terminal Conducted): FCC 15.247(d)

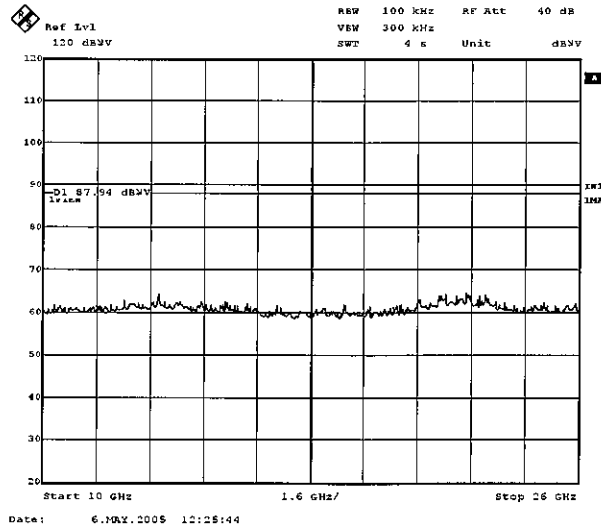
COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)
[IEEE802.11b(11Mbps)]
Ch1:2412MHz

REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

4.



5.

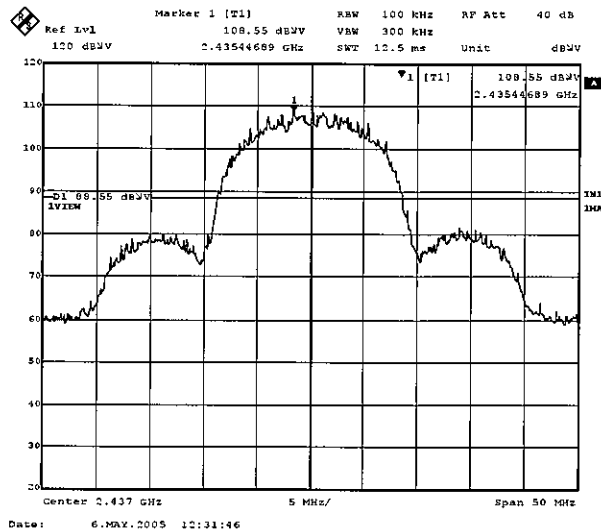


Out of Band Emission(Antenna Terminal Conducted): FCC 15.247(d)

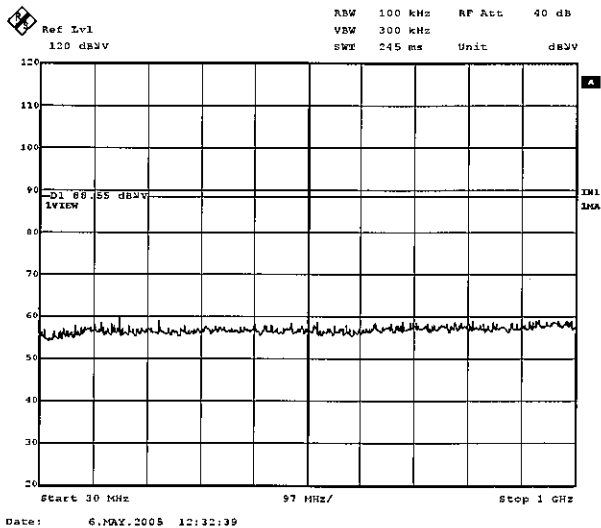
COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)
[IEEE802.11b(11Mbps)]
Ch6:2437MHz

REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

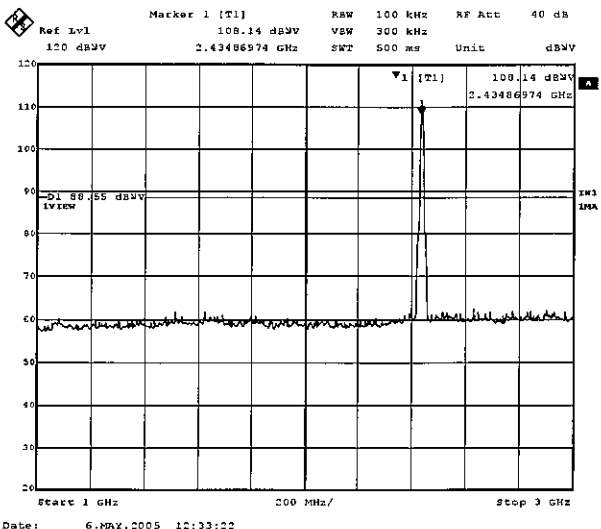
1.



2.



3.

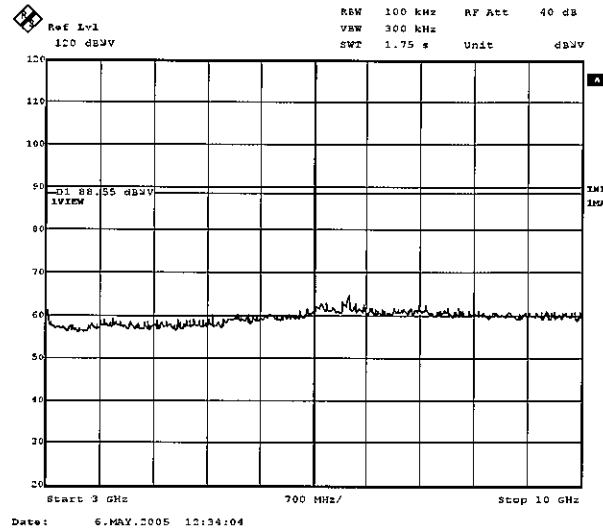


Out of Band Emission(Antenna Terminal Conducted): FCC 15.247(d)

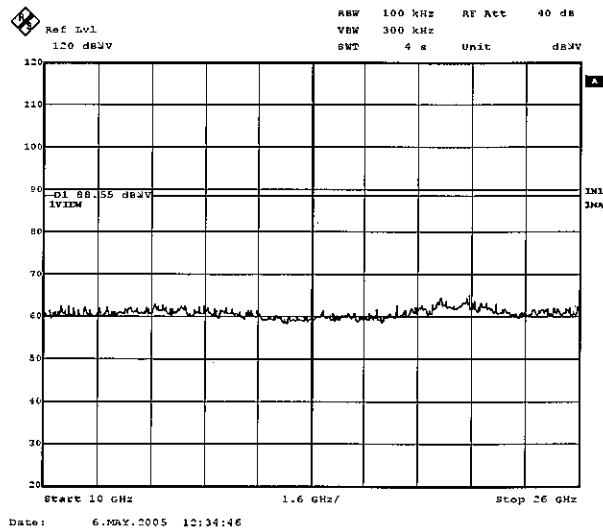
COMPANY : TOYOTA INDUSTRIES CORPORATION
 EQUIPMENT : Wireless LAN Module
 MODEL NUMBER: 6180210
 SERIAL NUMBER: ES0021
 FCC ID : M4B6180210
 POWER : DC3.3V(AC120V/60Hz)
 [IEEE802.11b(11Mbps)]
Ch6:2437MHz

REPORT NO : 25IE0043-YK-1
 REGULATION : FCC Part15SubpartC 247(d)
 DATE : 2005/5/6
 TEMP./HUMI : 25°C/46%
 TEST MODE : Transmitting
 ENGINEER : Toyokazu Imamura

4.



5.



Out of Band Emission(Antenna Terminal Conducted): FCC 15.247(d)

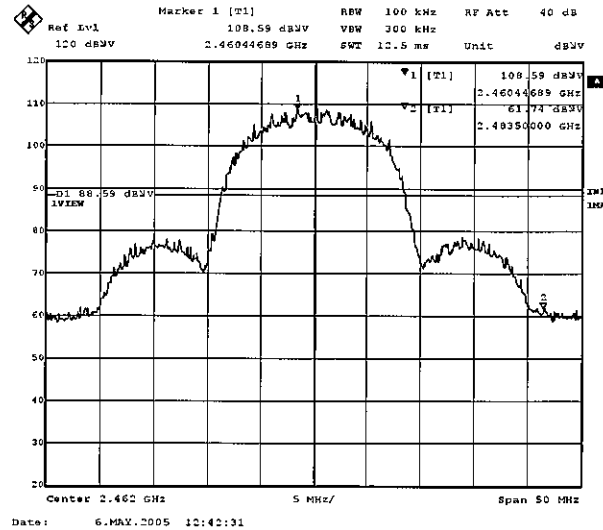
COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)

REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

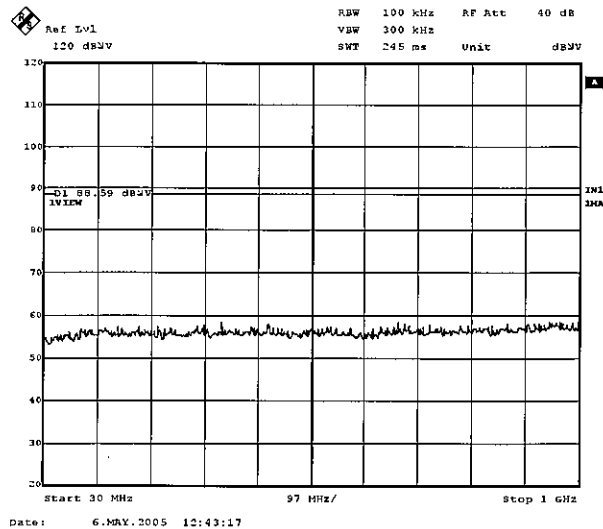
[IEEE802.11b(11Mbps)]

Ch11:2462MHz

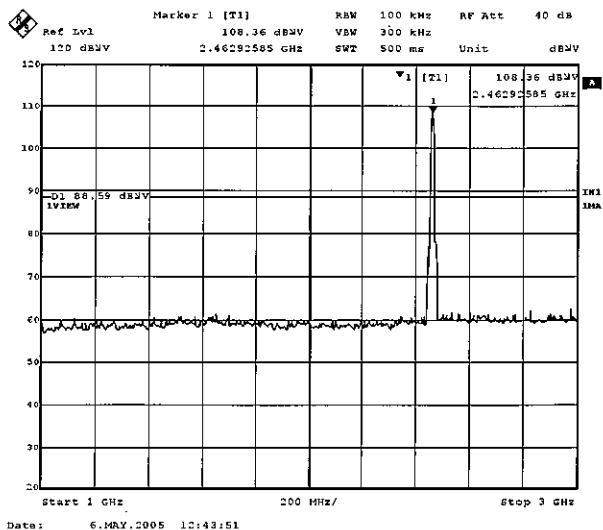
1.



2.



3.

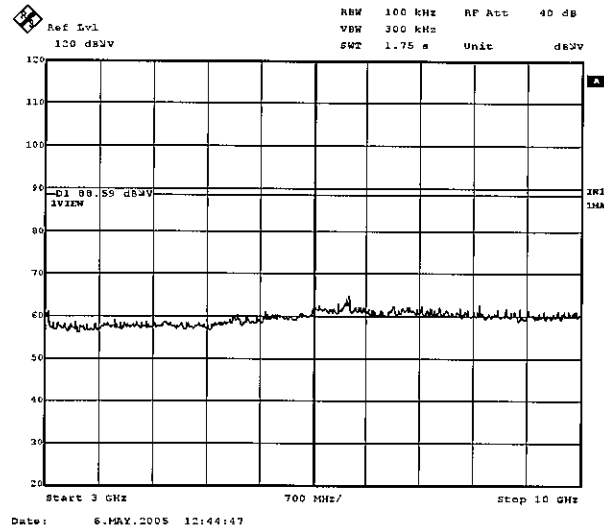


Out of Band Emission(Antenna Terminal Conducted): FCC 15.247(d)

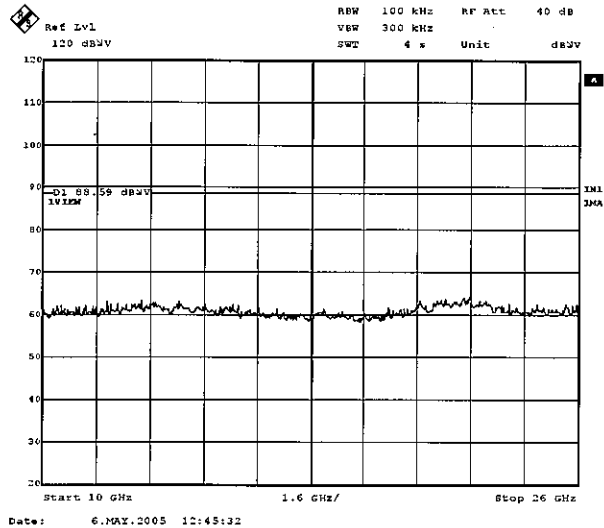
COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)
[IEEE802.11b(11Mbps)]
Ch11:2462MHz

REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

4.



5.



DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK **1**

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : DC3.3V
Mode : Transmitting:ch1 (2412MHz)
Remarks :
Date : 4/19/2005
Test Distance : 3 m
Temperature : 22 °C
Humidity : 45 %
Regulation : FCC Part15C § 15.209

Engineer : Toyokazu Imamura

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.	166.40	BB	35.7	31.1	15.7	28.3	2.5	6.0	31.6	27.0	43.5	11.9	16.5
2.	176.00	BB	37.6	31.9	16.3	28.3	2.6	6.0	34.2	28.5	43.5	9.3	15.0
3.	187.00	BB	42.5	37.5	16.8	28.3	2.7	6.0	39.7	34.7	43.5	3.8	8.8
4.	240.00	BB	38.4	35.1	17.5	28.0	3.1	6.0	37.0	33.7	46.0	9.0	12.3
5.	266.45	BB	38.2	33.5	18.5	28.1	3.3	6.0	37.9	33.2	46.0	8.1	12.8
6.	308.01	BB	38.0	34.6	14.4	27.9	3.6	6.0	34.1	30.7	46.0	11.9	15.3
7.	499.59	BB	32.5	39.6	18.3	29.2	4.6	6.0	32.2	39.3	46.0	13.8	6.7
8.	665.96	BB	41.7	36.2	20.4	29.4	5.3	6.0	44.0	38.5	46.0	2.0	7.5
9.	792.00	BB	32.0	29.4	21.5	29.2	5.9	6.0	36.2	33.6	46.0	9.8	12.4
10.	880.00	BB	32.9	31.5	22.8	29.0	6.2	6.0	38.9	37.5	46.0	7.1	8.5

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

■ ANTENNA: KBA-03 (BBA9106) 30-299MHz/KLA-03 (USLP9143) 300-1000MHz

■ AMP: KAF-05 (8447D) ■ RECEIVER: KTR-01 (ESI40) ■ KCC-30_31_32_34 (RE)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : DC3.3V
Mode : Transmitting:ch6 (2437MHz)
Remarks :
Date : 4/19/2005
Test Distance : 3 m
Temperature : 22 °C
Humidity : 45 %
Regulation : FCC Part15C § 15.209

Engineer : Toyokazu Imamura

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.	166.40	BB	37.4	31.9	15.7	28.3	2.5	6.0	33.3	27.8	43.5	10.2	15.7
2.	176.00	BB	37.7	31.0	16.3	28.3	2.6	6.0	34.3	27.6	43.5	9.2	15.9
3.	187.00	BB	41.4	37.1	16.8	28.3	2.7	6.0	38.6	34.3	43.5	4.9	9.2
4.	240.00	BB	36.9	30.7	17.5	28.0	3.1	6.0	35.5	29.3	46.0	10.5	16.7
5.	266.45	BB	36.9	32.8	18.5	28.1	3.3	6.0	36.6	32.5	46.0	9.4	13.5
6.	308.01	BB	37.2	33.8	14.4	27.9	3.6	6.0	33.3	29.9	46.0	12.7	16.1
7.	499.59	BB	36.4	36.5	18.3	29.2	4.6	6.0	36.1	36.2	46.0	9.9	9.8
8.	665.89	BB	36.5	32.7	20.4	29.4	5.3	6.0	38.8	35.0	46.0	7.2	11.0
9.	792.00	BB	37.1	33.6	21.5	29.2	5.9	6.0	41.3	37.8	46.0	4.7	8.2
10.	880.00	BB	32.2	31.4	22.8	29.0	6.2	6.0	38.2	37.4	46.0	7.8	8.6

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

■ ANTENNA: KBA-03 (BBA9106) 30-299MHz/KLA-03 (USLP9143) 300-1000MHz

■ AMP: KAF-05 (8447D) ■ RECEIVER: KTR-01 (ESI40) ■ KCC-30_31_32_34 (RE)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : DC3.3V
Mode : Transmitting:ch11(2462MHz)
Remarks :
Date : 4/19/2005
Test Distance : 3 m
Temperature : 22 °C
Humidity : 45 %
Regulation : FCC Part15C § 15.209

Engineer : Toyokazu Imamura

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.	166.40	BB	38.0	31.9	15.7	28.3	2.5	6.0	33.9	27.8	43.5	9.6	15.7
2.	176.00	BB	37.4	31.0	16.3	28.3	2.6	6.0	34.0	27.6	43.5	9.5	15.9
3.	187.00	BB	41.6	36.9	16.8	28.3	2.7	6.0	38.8	34.1	43.5	4.7	9.4
4.	240.00	BB	36.7	28.9	17.5	28.0	3.1	6.0	35.3	27.5	46.0	10.7	18.5
5.	266.45	BB	35.3	31.4	18.5	28.1	3.3	6.0	35.0	31.1	46.0	11.0	14.9
6.	308.01	BB	36.9	33.9	14.4	27.9	3.6	6.0	33.0	30.0	46.0	13.0	16.0
7.	499.59	BB	39.6	33.3	18.3	29.2	4.6	6.0	39.3	33.0	46.0	6.7	13.0
8.	665.70	BB	37.2	33.3	20.4	29.4	5.3	6.0	39.5	35.6	46.0	6.5	10.4
9.	792.00	BB	35.3	32.2	21.5	29.2	5.9	6.0	39.5	36.4	46.0	6.5	9.6
10.	880.00	BB	30.5	30.3	22.8	29.0	6.2	6.0	36.5	36.3	46.0	9.5	9.7

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

■ ANTENNA: KBA-03 (BBA9106) 30-299MHz/KLA-03 (USLP9143) 300-1000MHz

■ AMP: KAF-05 (8447D) ■ RECEIVER: KTR-01 (ESI40) ■ KCC-30_31_32_34 (RE)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK **1**

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : DC3.3V
Mode : Transmitting:ch1 (2412MHz)
Remarks :
Date : 4/28/2005
Test Distance : 3 m
Temperature : 20 °C Engineer : Toyokazu Imamura
Humidity : 40 %
Regulation : FCC Part15C § 15.209 (PK Detection)

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.	2390.00	BB	49.3	49.4	31.5	37.5	4.0	10.0	57.3	57.4	74.0	16.7	16.6
2.	4824.00	BB	49.0	48.3	35.4	37.0	5.5	0.5	53.4	52.7	74.0	20.6	21.3
3.	7236.00	BB	45.2	45.5	37.9	37.0	6.6	0.2	52.9	53.2	74.0	21.1	20.8
4.	9648.00	BB	47.2	47.8	39.0	37.1	7.4	0.4	56.9	57.5	74.0	17.1	16.5
5.	12060.00	BB	45.2	45.0	43.2	36.1	8.2	0.0	60.5	60.3	74.0	13.5	13.7
6.	14472.00	BB	44.8	44.8	41.5	35.0	8.9	0.3	60.5	60.5	74.0	13.5	13.5
7.	16884.00	BB	45.0	45.2	42.5	34.7	9.6	0.6	63.0	63.2	74.0	11.0	10.8
8.	19296.00	BB	44.7	45.7	40.3	34.4	10.3	0.0	60.9	61.9	74.0	13.1	12.1
9.	21708.00	BB	44.9	45.3	39.1	34.5	10.7	0.0	60.2	60.6	74.0	13.8	13.4
10.	24120.00	BB	45.6	45.7	39.9	34.1	11.1	0.0	62.5	62.6	74.0	11.5	11.4

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

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : DC3.3V
Mode : Transmitting:ch1 (2412MHz)
Remarks :
Date : 4/28/2005
Test Distance : 3 m
Temperature : 20 °C
Humidity : 40 %
Regulation : FCC Part15C § 15.209 (AV Detection)
Engineer : Toyokazu Imamura

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.	2390.00	BB	38.5	38.2	31.5	37.5	4.0	10.0	46.5	46.2	54.0	7.5	7.8
2.	4824.00	BB	42.5	41.8	35.4	37.0	5.5	0.5	46.9	46.2	54.0	7.1	7.8
3.	7236.00	BB	32.6	32.7	37.9	37.0	6.6	0.2	40.3	40.4	54.0	13.7	13.6
4.	9648.00	BB	36.9	36.4	39.0	37.1	7.4	0.4	46.6	46.1	54.0	7.4	7.9
5.	12060.00	BB	32.4	32.3	43.2	36.1	8.2	0.0	47.7	47.6	54.0	6.3	6.4
6.	14472.00	BB	31.8	31.7	41.5	35.0	8.9	0.3	47.5	47.4	54.0	6.5	6.6
7.	16884.00	BB	32.2	32.3	42.5	34.7	9.6	0.6	50.2	50.3	54.0	3.8	3.7
8.	19296.00	BB	32.1	32.1	40.3	34.4	10.3	0.0	48.3	48.3	54.0	5.7	5.7
9.	21708.00	BB	32.3	32.4	39.1	34.5	10.7	0.0	47.6	47.7	54.0	6.4	6.3
10.	24120.00	BB	32.6	32.6	39.9	34.1	11.1	0.0	49.5	49.5	54.0	4.5	4.5

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

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : DC3.3V
Mode : Transmitting:ch6 (2437MHz)
Remarks :
Date : 4/28/2005
Test Distance : 3 m
Temperature : 20 °C
Humidity : 40 %
Regulation : FCC Part15C § 15.209 (PK Detection)

Engineer : Toyokazu Imamura

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.	4874.00	BB	49.9	49.4	35.7	37.0	5.5	0.5	54.6	54.1	74.0	19.4	19.9
2.	7311.00	BB	45.7	45.3	38.0	37.0	6.7	0.2	53.6	53.2	74.0	20.4	20.8
3.	9748.00	BB	46.7	47.6	39.0	37.1	7.4	0.3	56.3	57.2	74.0	17.7	16.8
4.	12185.00	BB	45.0	45.5	43.4	35.9	8.2	0.0	60.7	61.2	74.0	13.3	12.8
5.	14622.00	BB	45.2	45.3	42.3	35.1	8.9	0.4	61.7	61.8	74.0	12.3	12.2
6.	17059.00	BB	44.9	44.9	42.6	34.5	9.7	0.6	63.3	63.3	74.0	10.7	10.7
7.	19496.00	BB	45.3	44.7	39.9	34.5	10.5	0.0	61.2	60.6	74.0	12.8	13.4
8.	21933.00	BB	46.1	46.3	39.2	34.3	10.8	0.0	61.8	62.0	74.0	12.2	12.0
9.	24370.00	BB	45.3	46.0	40.2	34.1	11.1	0.0	62.5	63.2	74.0	11.5	10.8

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

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK = 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180210
Serial No. : ES0021
Power : DC3.3V
Mode : Transmitting:ch6(2437MHz)
Remarks :
Date : 4/28/2005
Test Distance : 3 m
Temperature : 20 °C Engineer : Toyokazu Imamura
Humidity : 40 %
Regulation : FCC Part15C § 15.209(AV Detection)

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.	4874.00	BB	43.1	43.0	35.7	37.0	5.5	0.5	47.8	47.7	54.0	6.2	6.3
2.	7311.00	BB	32.6	32.5	38.0	37.0	6.7	0.2	40.5	40.4	54.0	13.5	13.6
3.	9748.00	BB	36.4	36.6	39.0	37.1	7.4	0.3	46.0	46.2	54.0	8.0	7.8
4.	12185.00	BB	32.4	32.4	43.4	35.9	8.2	0.0	48.1	48.1	54.0	5.9	5.9
5.	14622.00	BB	32.2	32.7	42.3	35.1	8.9	0.4	48.7	49.2	54.0	5.3	4.8
6.	17059.00	BB	32.1	32.1	42.6	34.5	9.7	0.6	50.5	50.5	54.0	3.5	3.5
7.	19496.00	BB	32.0	31.9	39.9	34.5	10.5	0.0	47.9	47.8	54.0	6.1	6.2
8.	21933.00	BB	33.5	33.4	39.2	34.3	10.8	0.0	49.2	49.1	54.0	4.8	4.9
9.	24370.00	BB	33.0	33.0	40.2	34.1	11.1	0.0	50.2	50.2	54.0	3.8	3.8

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

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK- 1

Applicant : TOYOTA INDUSTRIES CORPORATION
 Kind of Equipment : Wireless LAN Module
 Model No. : 6180210
 Serial No. : ES0021
 Power : DC3.3V
 Mode : Transmitting:ch11(2462MHz)
 Remarks :
 Date : 4/28/2005
 Test Distance : 3 m
 Temperature : 20 °C
 Humidity : 40 %
 Regulation : FCC Part15C § 15.209(PK Detection)

Engineer : Toyokazu Imamura

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.	2483.50	BB	53.4	50.9	32.0	37.6	4.0	10.0	61.8	59.3	74.0	12.2	14.7
2.	2498.85	BB	50.6	49.7	32.1	37.6	4.0	10.0	59.1	58.2	74.0	14.9	15.8
3.	4924.00	BB	49.9	50.1	36.0	37.0	5.6	0.5	55.0	55.2	74.0	19.0	18.8
4.	7386.00	BB	45.9	45.3	38.2	37.1	6.7	0.2	53.9	53.3	74.0	20.1	20.7
5.	9848.00	BB	46.4	46.5	39.0	37.1	7.4	0.2	55.9	56.0	74.0	18.1	18.0
6.	12310.00	BB	45.3	45.8	43.5	35.7	8.1	0.0	61.2	61.7	74.0	12.8	12.3
7.	14772.00	BB	45.5	45.0	43.1	35.2	9.0	0.6	63.0	62.5	74.0	11.0	11.5
8.	17234.00	BB	44.9	44.1	42.8	34.6	9.6	0.3	63.0	62.2	74.0	11.0	11.8
9.	19696.00	BB	45.5	45.0	39.9	34.7	10.5	0.0	61.2	60.7	74.0	12.8	13.3
10.	22158.00	BB	46.1	45.9	39.6	34.2	11.0	0.0	62.5	62.3	74.0	11.5	11.7
11.	24620.00	BB	46.4	46.7	40.3	34.0	11.3	0.0	64.0	64.3	74.0	10.0	9.7

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

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ESI40)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

Yamakita No.1 Anechoic Chamber

Report No. : 251E0043-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
 Kind of Equipment : Wireless LAN Module
 Model No. : 6180210
 Serial No. : ES0021
 Power : DC3.3V
 Mode : Transmitting:ch11(2462MHz)
 Remarks :
 Date : 4/28/2005
 Test Distance : 3 m
 Temperature : 20 °C
 Humidity : 40 %
 Regulation : FCC Part15C § 15.209(AV Detection)

Engineer : Toyokazu Imamura

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.	2483.50	BB	42.0	39.7	32.0	37.6	4.0	10.0	50.4	48.1	54.0	3.6	5.9
2.	2498.85	BB	40.1	38.0	32.1	37.6	4.0	10.0	48.6	46.5	54.0	5.4	7.5
3.	4924.00	BB	43.5	43.7	36.0	37.0	5.6	0.5	48.6	48.8	54.0	5.4	5.2
4.	7386.00	BB	32.6	32.3	38.2	37.1	6.7	0.2	40.6	40.3	54.0	13.4	13.7
5.	9848.00	BB	34.7	35.5	39.0	37.1	7.4	0.2	44.2	45.0	54.0	9.8	9.0
6.	12310.00	BB	32.4	32.4	43.5	35.7	8.1	0.0	48.3	48.3	54.0	5.7	5.7
7.	14772.00	BB	33.0	32.1	43.1	35.2	9.0	0.6	50.5	49.6	54.0	3.5	4.4
8.	17234.00	BB	31.9	31.9	42.8	34.6	9.6	0.3	50.0	50.0	54.0	4.0	4.0
9.	19696.00	BB	32.1	32.1	39.9	34.7	10.5	0.0	47.8	47.8	54.0	6.2	6.2
10.	22158.00	BB	33.3	33.3	39.6	34.2	11.0	0.0	49.7	49.7	54.0	4.3	4.3
11.	24620.00	BB	33.3	33.4	40.3	34.0	11.3	0.0	50.9	51.0	54.0	3.1	3.0

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

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz

■ CABLE: KCC-D3/D7 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

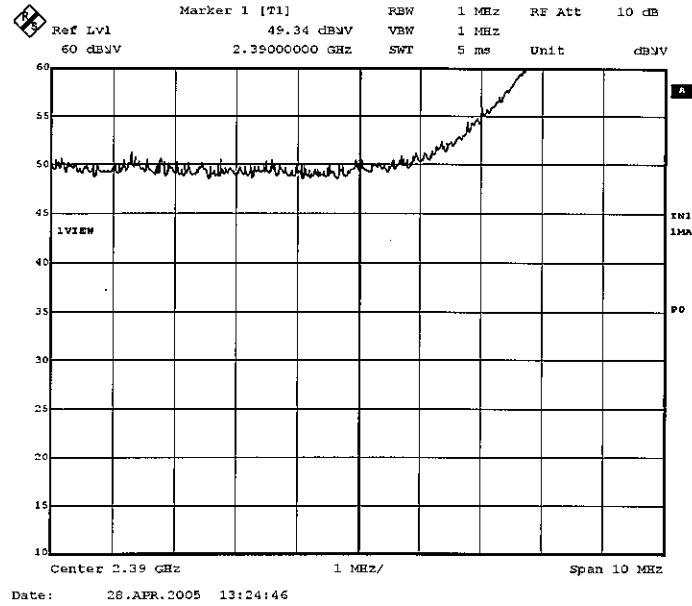
Restricted band edges: FCC 15.247(d)

COMPANY	: TOYOTA INDUSTRIES CORPORATION	REPORT NO	: 25IE0043-YK-1
EQUIPMENT	: Wireless LAN Module	REGULATION	: FCC Part15SubpartC 247(d)
MODEL NUMBER	: 6180210	DATE	: 2005/5/6
SERIAL NUMBER	: ES0021	TEMP/HUMI	: 25°C/46%
FCC ID	: M4B6180210	TEST MODE	: Transmitting
POWER	: DC3.3V(AC120V/60Hz)	ENGINEER	: Toyokazu Imamura

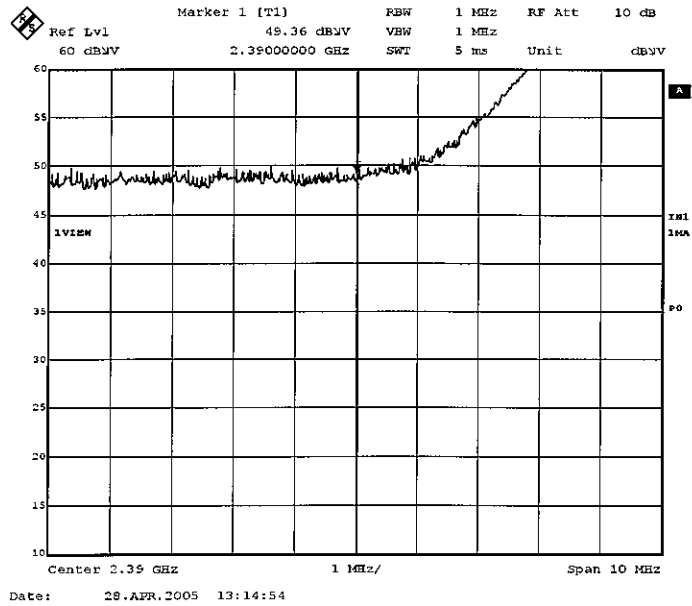
[IEEE802.11b(11Mbps)]

2.39GHz(CH1:2412MHz)

1. Horizontal/PK



2. Vertical/PK



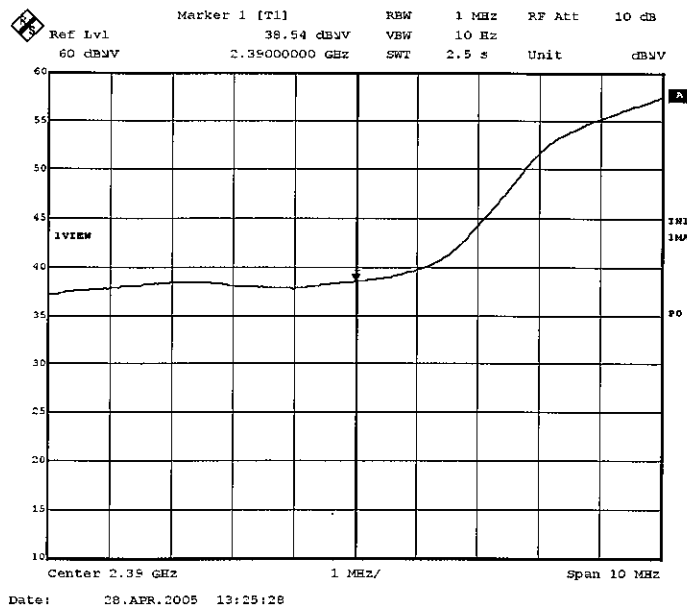
Restricted band edges: FCC 15.247(d)

COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)

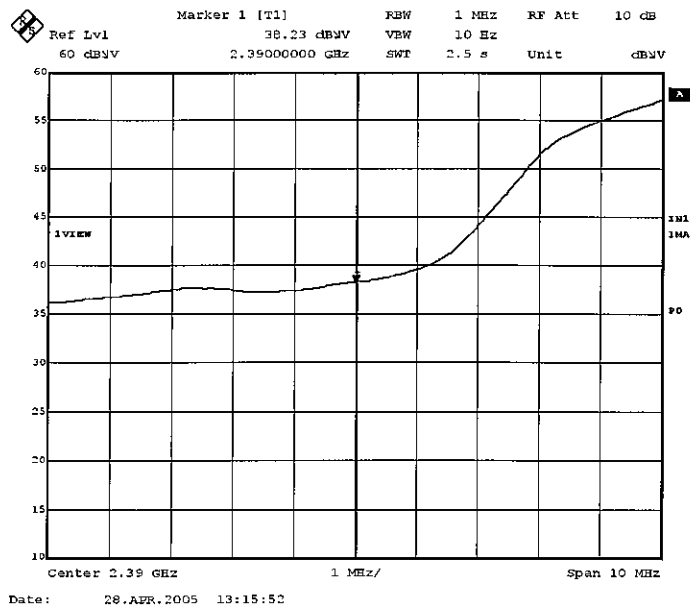
REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[IEEE802.11b(11Mbps)]
2.39GHz(CH1:2412MHz)

1. Horizontal/AV



2. Vertical/AV



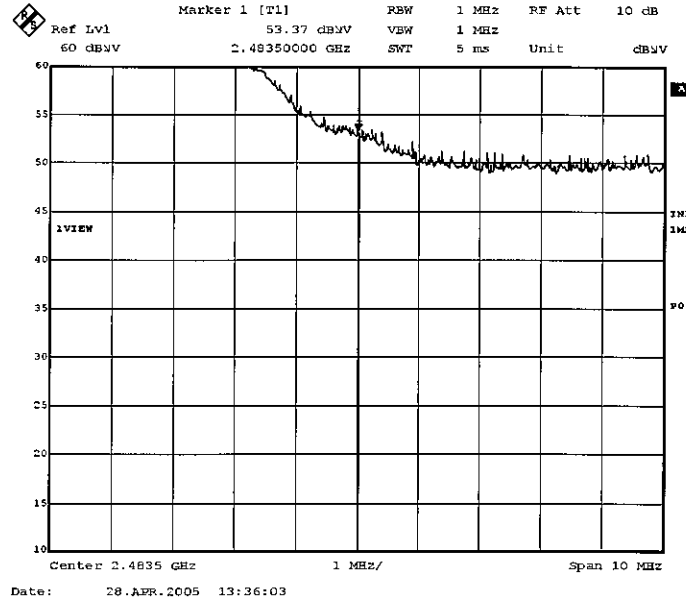
Restricted band edges: FCC 15.247(d)

COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)

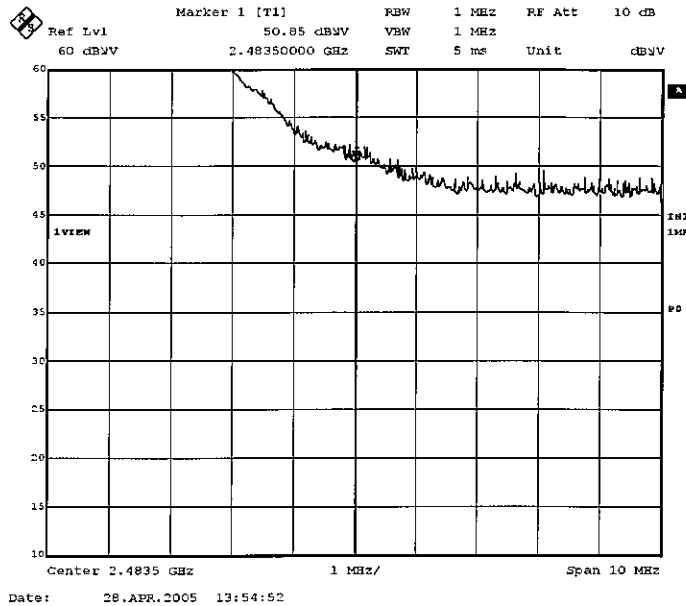
REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[IEEE802.11b(11Mbps)]
2.4835GHz(CH11:2462MHz)

1. Horizontal/PK



2. Vertical/PK



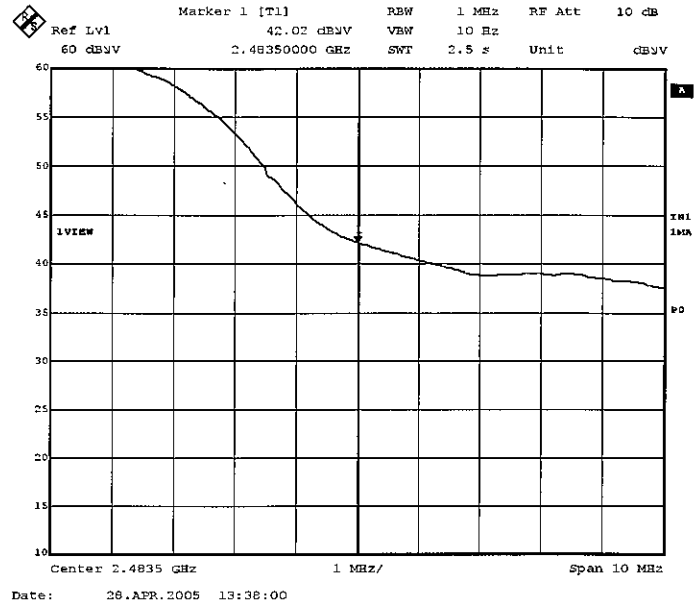
Restricted band edges: FCC 15.247(d)

COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)

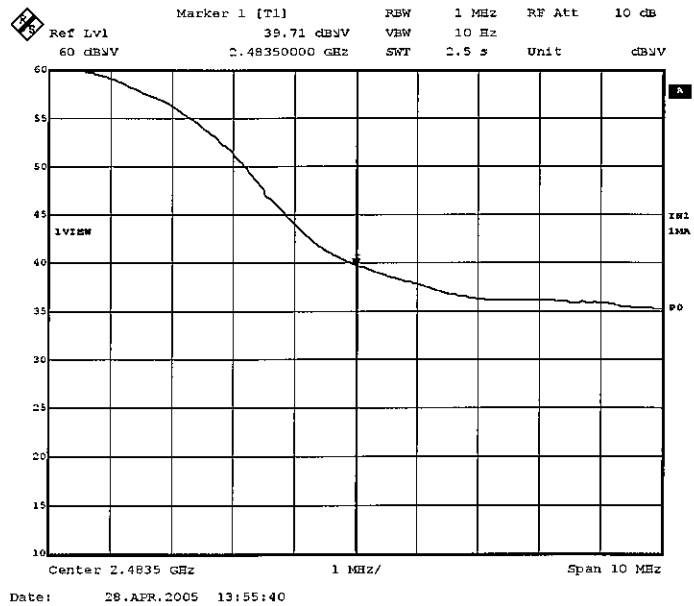
REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(d)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[IEEE802.11b(11Mbps)]
2.4835GHz(CH11:2462MHz)

1. Horizontal/AV



2. Vertical/AV



Power Density (Conducted)

UL Apex Co.,Ltd
YAMAKITA NO.2 Shielded Room

COMPANY : TOYOTA INDUSTRIES CORPORATIC REPORT NO : 25IE0043-YK-1
EQUIPMENT : Wireless LAN Module REGULATION : Fcc Part15SubpartC 247(e)
MODEL NUMBER : 6180210 DATE : 2004/5/6
SERIAL NUMBER : ES0021 TEMP./HUMI : 25°C/46%
FCC ID : M4B6180210
POWER : DC3.3V(PC:AC120V/60Hz)
TEST MODE : Transmitting

ENGINEER : Toyokazu Imamura

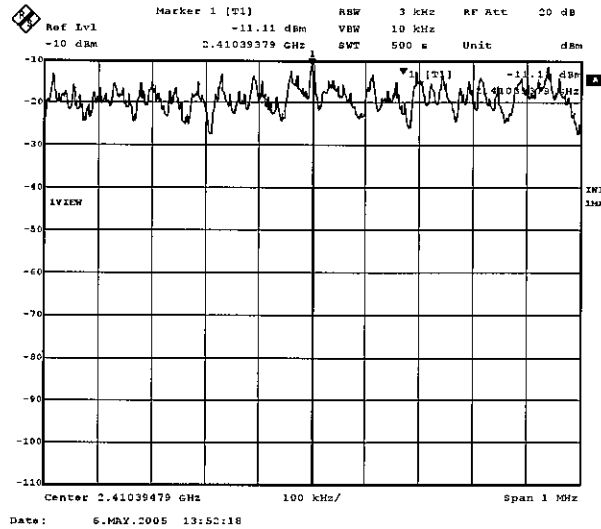
IEEE802.11b(11Mbps)

CH	FREQ	S/A Reading	Cable Loss	Results	Limit	MARGIN
	[GHz]	[dBm]	[dB]	[dBm]	[dBm]	[dB]
Low	2.41039379	-11.11	0.6	-10.51	8.0	18.5
Mid	2.43614679	-11.76	0.6	-11.16	8.0	19.2
High	2.46114629	-12.17	0.6	-11.57	8.0	19.6

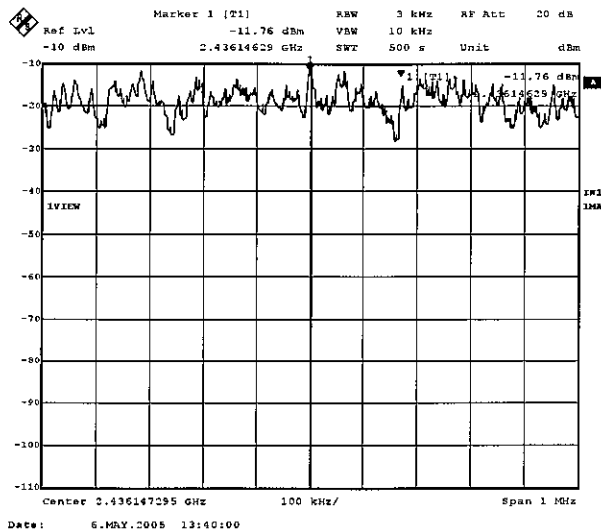
Power Density: FCC 15.247(e)

COMPANY : TOYOTA INDUSTRIES CORPORATION
EQUIPMENT : Wireless LAN Module
MODEL NUMBER: 6180210
SERIAL NUMBER: ES0021
FCC ID : M4B6180210
POWER : DC3.3V(AC120V/60Hz)
[IEEE802.11b(11Mbps)]
1. ch 1: 2412MHz

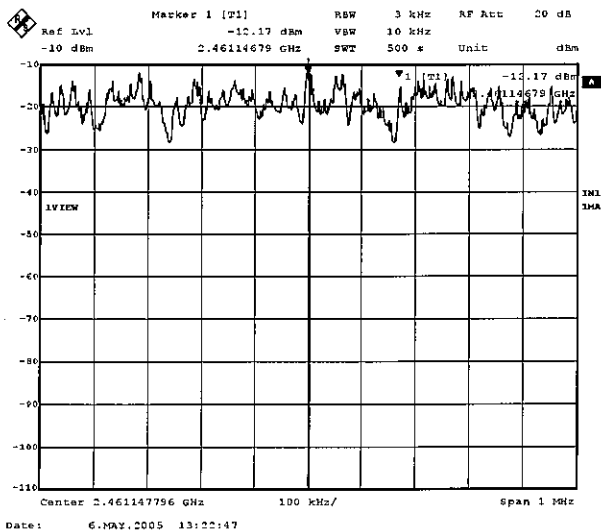
UL Apex Co.,Ltd. Yamakita No.2 Shielded Room
REPORT NO : 25IE0043-YK-1
REGULATION : FCC Part15SubpartC 247(e)
DATE : 2005/5/6
TEMP./HUMI : 25°C/46%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura



2. ch 6: 2437MHz



3. ch 11: 2462MHz



Test Report No :25IE0043-YK-1

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
KAEC-01(NSA)	Anechoic Chamber	JSE	Semi 3m	RE	2004/09/05 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	RE	2005/04/28 * 12
KAF-05	Pre Amplifier	Agilent	8447D	RE	2004/05/26 * 12
KAT10-S1	Attenuator	Agilent	8449D 010	RE	2005/04/12 * 12
KAT6-02	Attenuator	INMET	18N-6dB	RE	2005/04/07 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/01/29 * 12
KCC-14/15/16 /18/KPL-01	Coaxial Cable/Pulse Limiter	Fujikura/Suhner/PMM	5D-2W/8D-2W/S042 72B/S04272B/PL01	CE	2004/07/10 * 12
KCC-30/31/32 /34	Coaxial Cable	Fujikura/Suhner	5D-2W/S04272B	RE	2005/01/06 * 12
KCC-D3/D7	Coaxial Cable	Rosenberger/Advantest	2201/JUN-08-01-06 1	RE	2005/04/12 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2005/04/12 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2004/07/30 * 12
KHA-03	Horn Antenna	EMCO	3160-09	RE	2004/05/01 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/01/29 * 12
KLS-01	LISN(AMN)	Schwarzbeck	NSLK8126	CE	2004/06/23 * 12
KSA-01	Spectrum Analyzer	Advantest	R3365	CE	2004/07/06 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	RE	2004/09/15 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ES140	RE, AT 1,2,3,4	2004/07/28 * 12
KTR-02	Test Receiver	Rohde & Schwarz	ESCS30	CE	2004/11/25 * 12
KCC-D7	Coaxial Cable	Advantest	A01002	AT 1,2,3,4	2005/04/12 * 12

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: 6dB Bandwidth
 - 2: Maximum Peak Output Power
 - 3: Out of Band Emission (Conducted)
 - 4: Peak Power Density