EMI TEST REPORT

Test Report No. : 26BE0140-YK-1

Applicant	:	**TOYOTA INDUSTRIES CORPORATION**
Type of Equipment	:	**Wireless LAN Module**
Model No.	:	**6180110**
FCC ID	:	**M4B6180210**
Test Item & Standard:		**Conducted Emissions** **Out of Band Emissions (Radiated)** **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: September 22, 2005

Tested by: Takahiro Suzuki

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

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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 : +81-3-5401-0575

Contact Person : Hideki Fujii

2 Product Description

Type of Equipment : Wireless LAN Module

Model No. : 6180110

Serial No. : ES0081

Rating : DC3.3V

Country of Manufacture : Japan

Receipt Date of Sample : September 21, 2005

Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

Model: 6180110 (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	:	2.4GHz small built-in antenna with a ground
Antenna connector type	:	U. FL-LP-040
Antenna gain	:	7.0dBi (Max.) *included cable loss
Mode of operation	:	Simplex
Emission Designation	:	G1D
Operation temperature range:		-20 ~ 60 deg. C.

*FCC Part15.31 (e)

Host devise (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.

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	16.1dB (0.1938MHz, QP, Transmitting 2412MHz)	Complied
6dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (a)(2)	Conducted	Excluded *1	-	N/A
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (b)(3)	Conducted	Excluded *1 *2		N/A
Spurious Emission & Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (d)	Radiated	N/A	1.0dB (187.00MHz, QP, Horizontal Tx 2412MHz,2462MHz)	Complied
Power Density	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247 (e)	Conducted	Excluded *1	-	N/A

Note: UL Apex's EMI Work Procedures No.QPM05.
These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".

*1 Results for these test items are described in the test report 25IE0043-YK-1. The Module has been certificated with other type of antenna.

*2 Since the transmitting antenna of directional gain is greater than 6dBi, the limit value is reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi in accordance with FCC Part 15.247 (b)(4). Therefore, the data of maximum peak output power meets the limit.

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

3.3 Uncertainty

Conducted emission
The measurement uncertainty (with a 95% confidence level) for this test was ±1.3dB.
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 ±4.8dB.
The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is ±5.2dB.
The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is ±6.6dB.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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. : IC3489A

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. : IC3489A-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. : IC3489A-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		

4 System Test Configuration

4.1 Justification

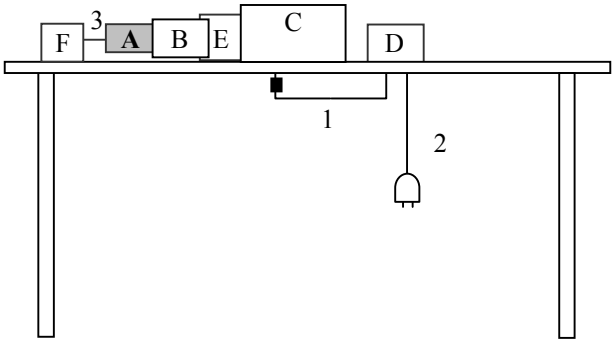
The system was configured in typical fashion (as a customer would normally use it) for testing.

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

4.2 Configuration of Tested System

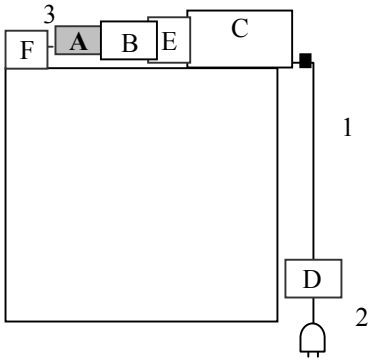
■: Ferrite core (Standard attachment of PC)

Front View (Conducted emission)



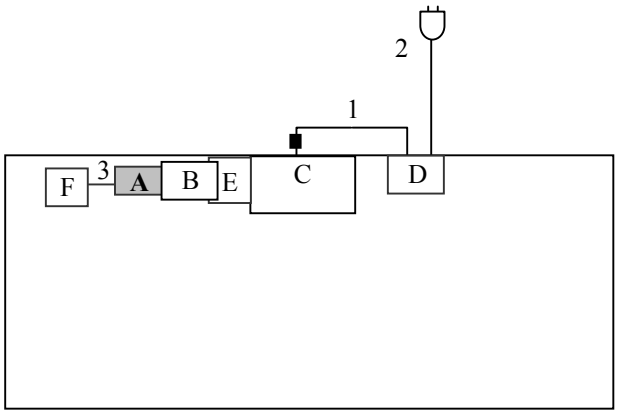
AC120V/60Hz

Front View (Radiated emission)

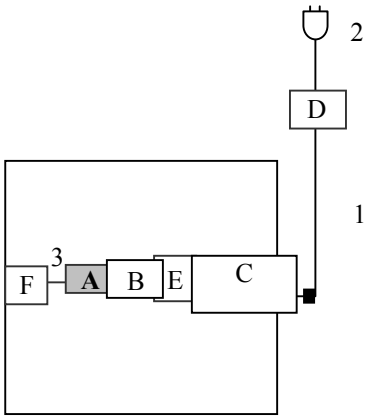


AC120V/60Hz

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	6180110	ES0081	TOYOTA INDUSTRIES CORPORATION	M4B6180210 (EUT)
B	PC Card Adapter	WLI-CF-OP	E30507	BUFFALO	-
C	Notebook PC	X30 2672-12J	99TAH27	IBM	-
D	AC Adapter	02K6808	11S02K6808Z1Z3BG342MHT	IBM	-
E	Extend Board	-	-	-	(Test jig)
F	Antenna	ANTB24-043A0	-	TOYOTA INDUSTRIES CORPORATION	(EUT)

List of cables used

No.	Name	Length (m)	Shield	Remark
1	DC cable	1.9	Unshielded	-
2	AC cable	1.0	Unshielded	-
3	Antenna cable	0.08	Shielded	-

5 Conducted Emissions

5.1 Operating environment

The test was carried out in No.3 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 15 to 19

Date : September 22, 2005 Test engineer : Takahiro Suzuki

6 Out of Band Emissions (Radiated)

6.1 Operating environment

The test was carried out in No.2 open site.

6.2 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.

6.3 Test conditions

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

6.4 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 IF Bandwidth	QP: BW 120kHz	PK: RBW: 1MHz/VBW: 1MHz AV: RBW: 1MHz/VBW: 10Hz

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

The antenna of 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 14.
With the position, the noise levels of all the frequencies were measured.

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

* Position of PC was set in reference to the test report 25IE0043-YK-1.

6.5 Results

Summary of the test results : Pass
Test data : APPENDIX 2 Page 20 to 22 (30 - 1000MHz)
: APPENDIX 2 Page 23 to 28 (1 - 26GHz)

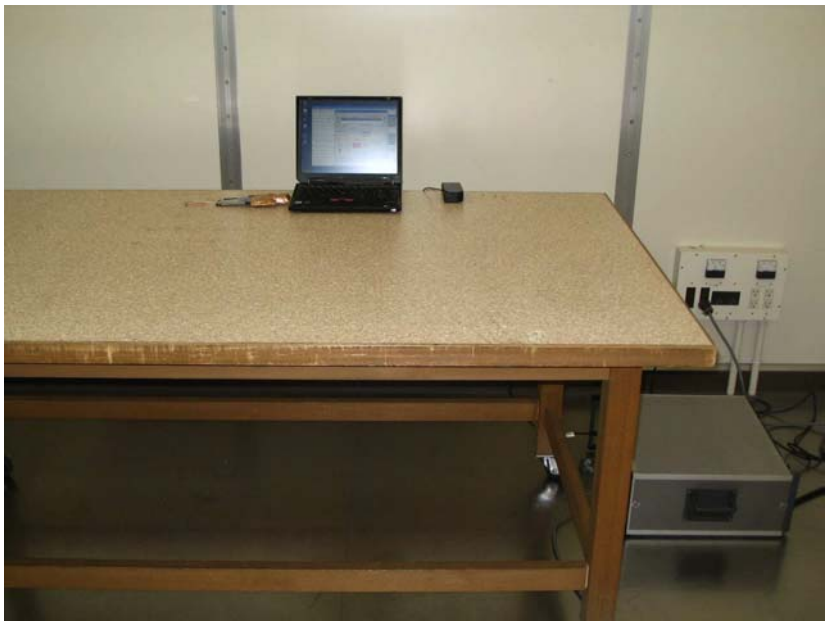
Date : September 22, 2005 Test engineer : Takahiro Suzuki

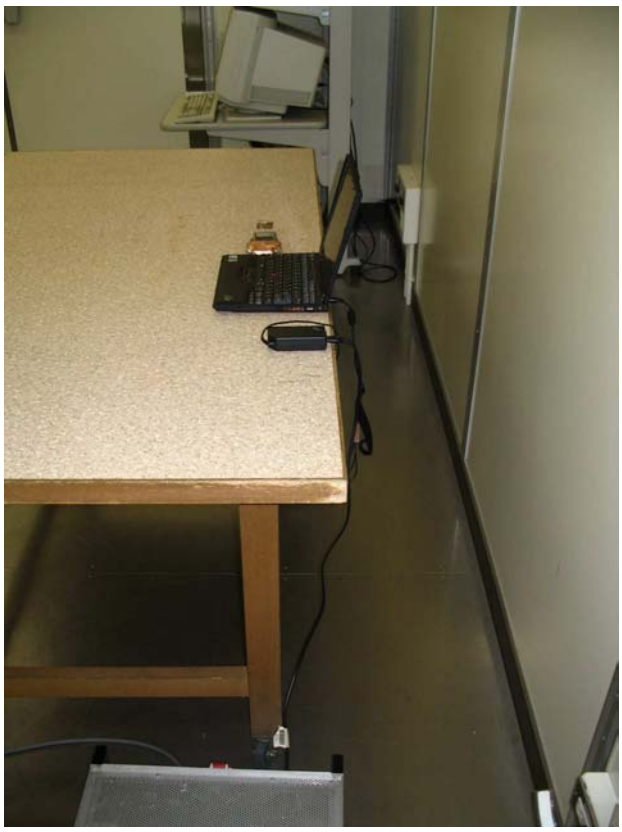
APPENDIX 1: Photographs of test setup

APPENDIX 2: Test Data

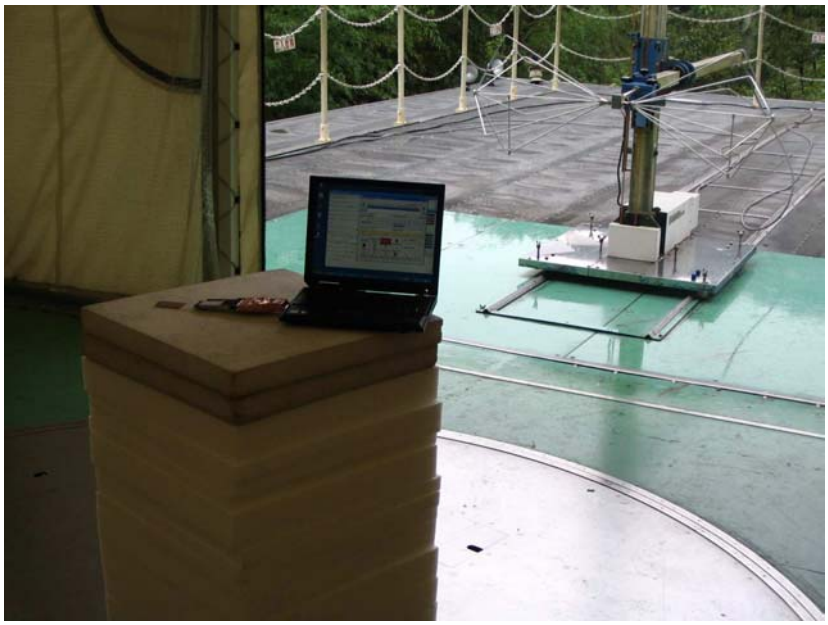
APPENDIX 3: Test instruments

Conducted emission

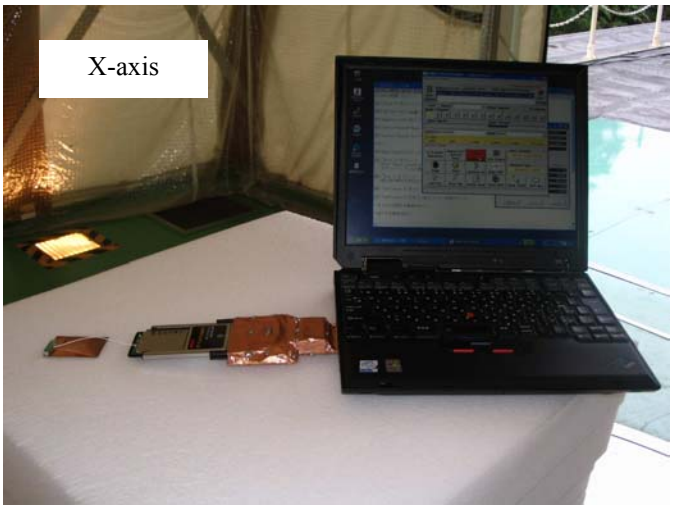




Radiated emission



Pre check of worse-case position



DATA OF CONDUCTION TEST

UL Apex Co.,Ltd.
YAMAKITA No.3 SHIELD TEST ROOM
Report No. : 26BE0140-YK-1

Applicant	: TOYOTA INDUSTRIES CORPORATION		
Kind of Equipment	: Wireless LAN Module		
Model No.	: 6180110		
Serial No.	: ES0081		
Power	: AC120V/60Hz		
Mode	: Transmitting:ch1(2412MHz)		
Remarks	: ANTB24-043A0		
Date	: 9/22/2005		
Phase	: Single Phase		
Temperature	: 23 ℃	Engineer	: Takahiro Suzuki
Humidity	: 64 %		
Regulation	: FCC Part15C §15.207.(CISPR Pub.22)		

No.	FREQ.	READING(N) QP	READING(N) AV	READING(L1) QP	READING(L1) AV	LISN FACTOR	CABLE LOSS	ATTEN.	RESULT QP	RESULT AV	LIMITS QP	LIMITS AV	MARGIN QP	MARGIN AV
	[MHz]	[dBμV]		[dBμV]		[dB]	[dB]	[dB]	[dB]		[dBμV]		[dBμV]	[dB]
1.	0.1938	47.0	-	47.6	-	0.1	0.1	0.0	47.8	-	63.9	53.9	16.1	-
2.	0.2587	38.7	-	39.6	-	0.1	0.1	0.0	39.8	-	61.5	51.5	21.7	-
3.	0.3246	32.6	-	33.9	-	0.1	0.2	0.0	34.2	-	59.6	49.6	25.4	-
4.	0.5159	31.0	-	30.6	-	0.1	0.2	0.0	31.3	-	56.0	46.0	24.7	-
5.	1.7525	23.0	-	22.6	-	0.1	0.4	0.0	23.5	-	56.0	46.0	32.5	-
6.	2.2710	23.6	-	22.8	-	0.1	0.4	0.0	24.1	-	56.0	46.0	31.9	-

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

■LISN:KLS-05(NSLK8126) ■COAXIAL CABLE:KCC-24/25/26/28
■PULSE LIMITTER:KPL-02 ■EMI RECEIVER:KTR-03(ESHS10)

DATA OF CONDUCTION TEST

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Humidity	: 64 %		
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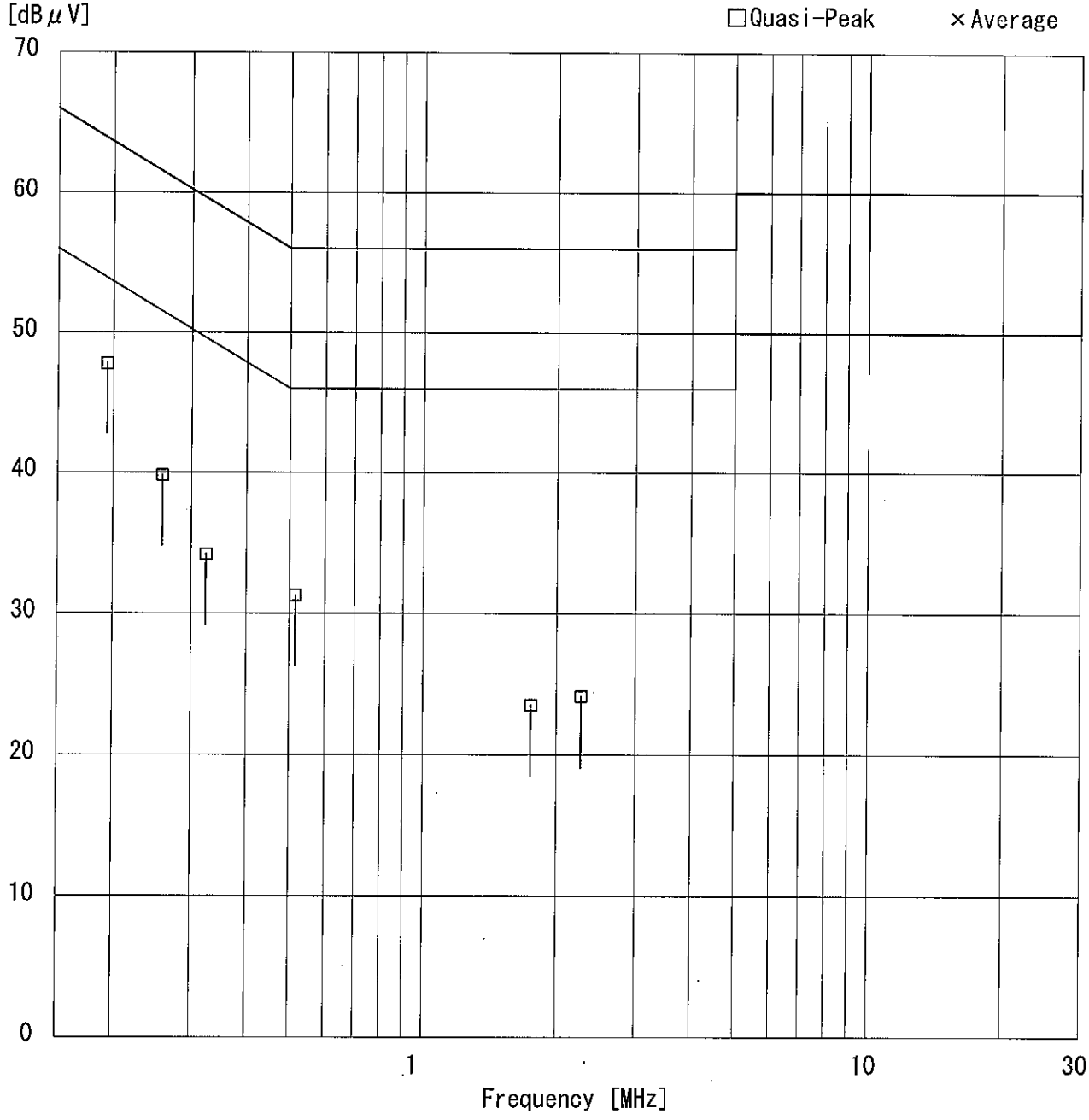

DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.
YAMAKITA No.3 SHIELD TEST ROOM
Report No. : 26BE0140-YK - 1

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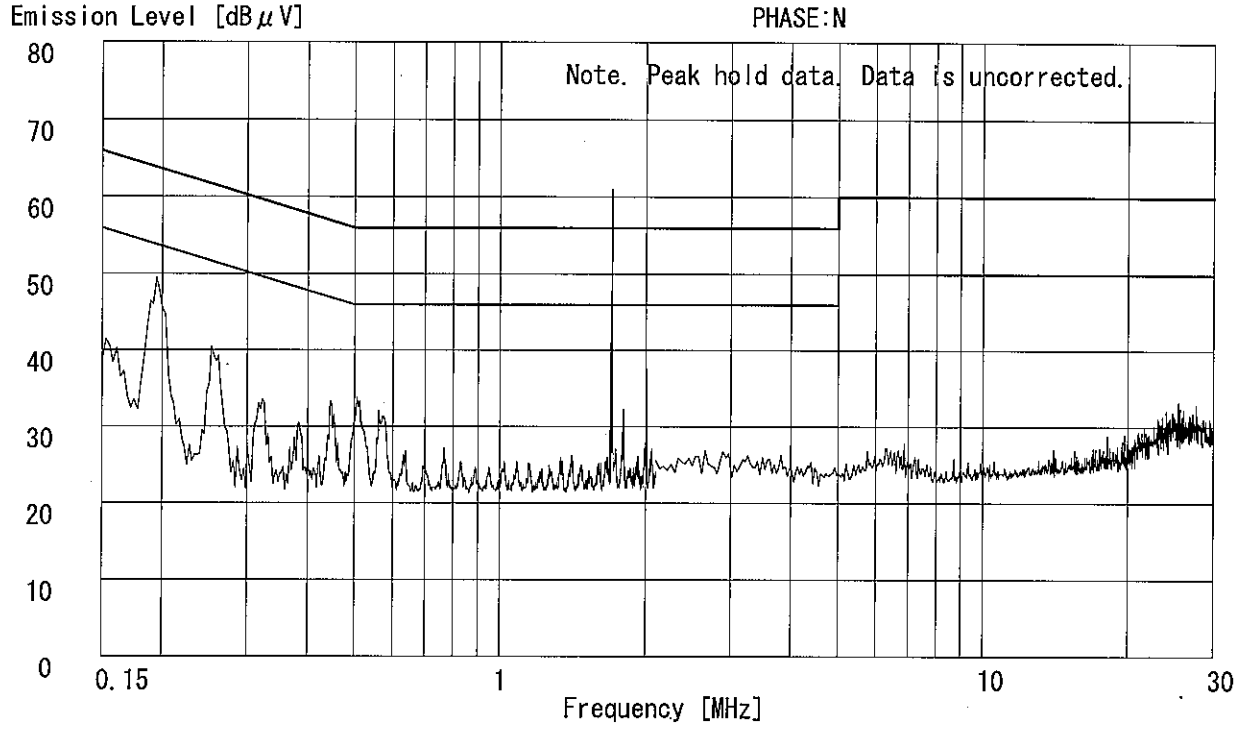
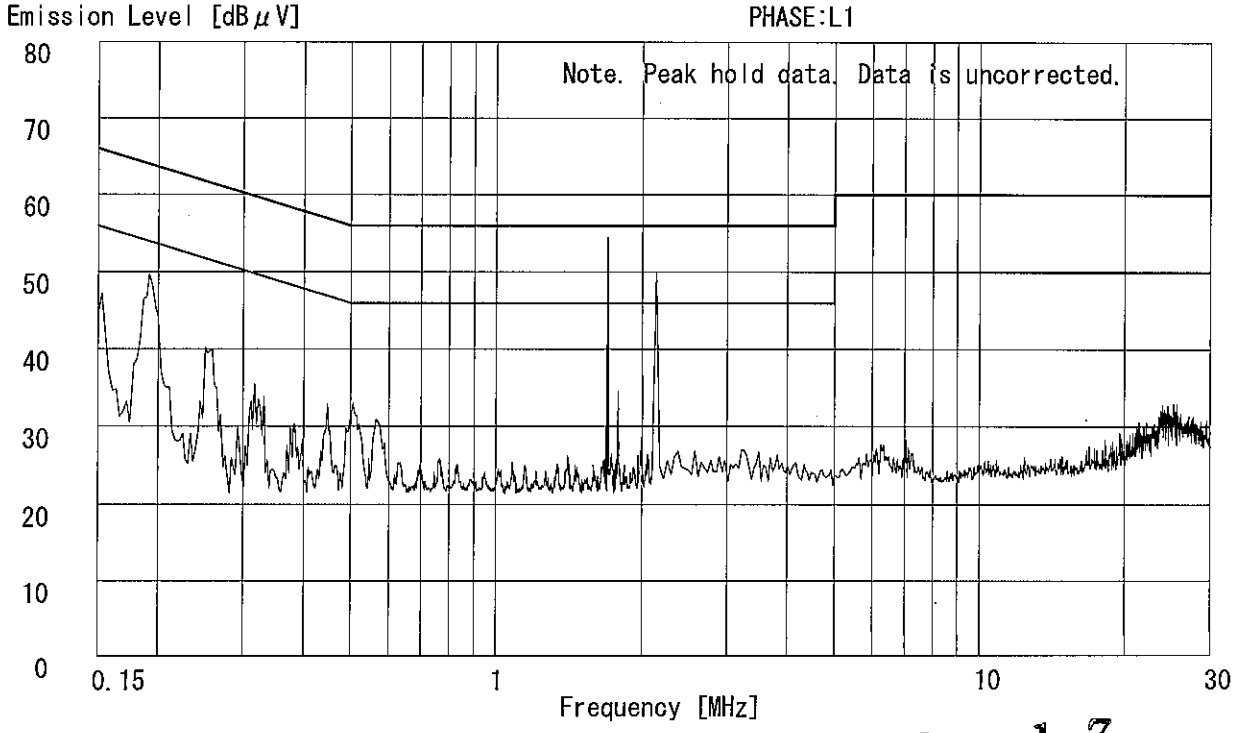
Temperature	: 23 ℃	Engineer	: Takahiro Suzuki
Humidity	: 64 %		
Regulation 1	: FCC Part15C §15.207.(CISPR Pub.22)		
Regulation 2	: FCC Part15C §15.207.(CISPR Pub.22)		

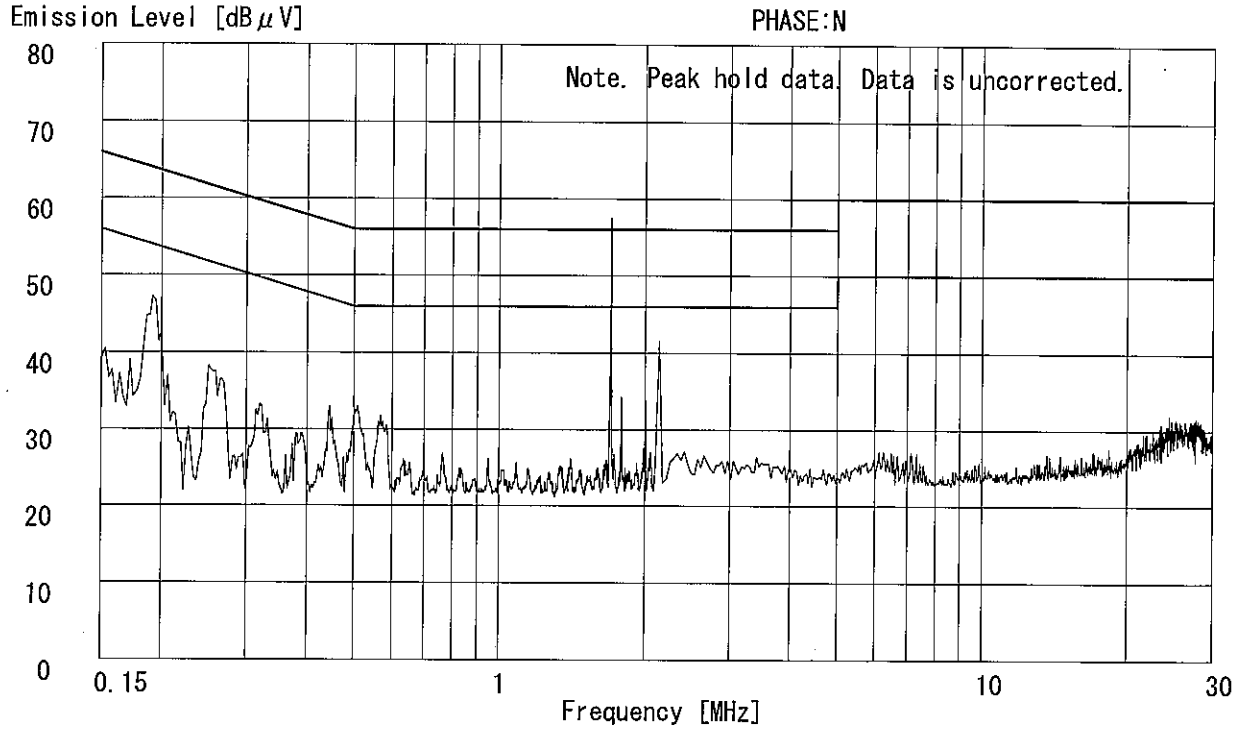


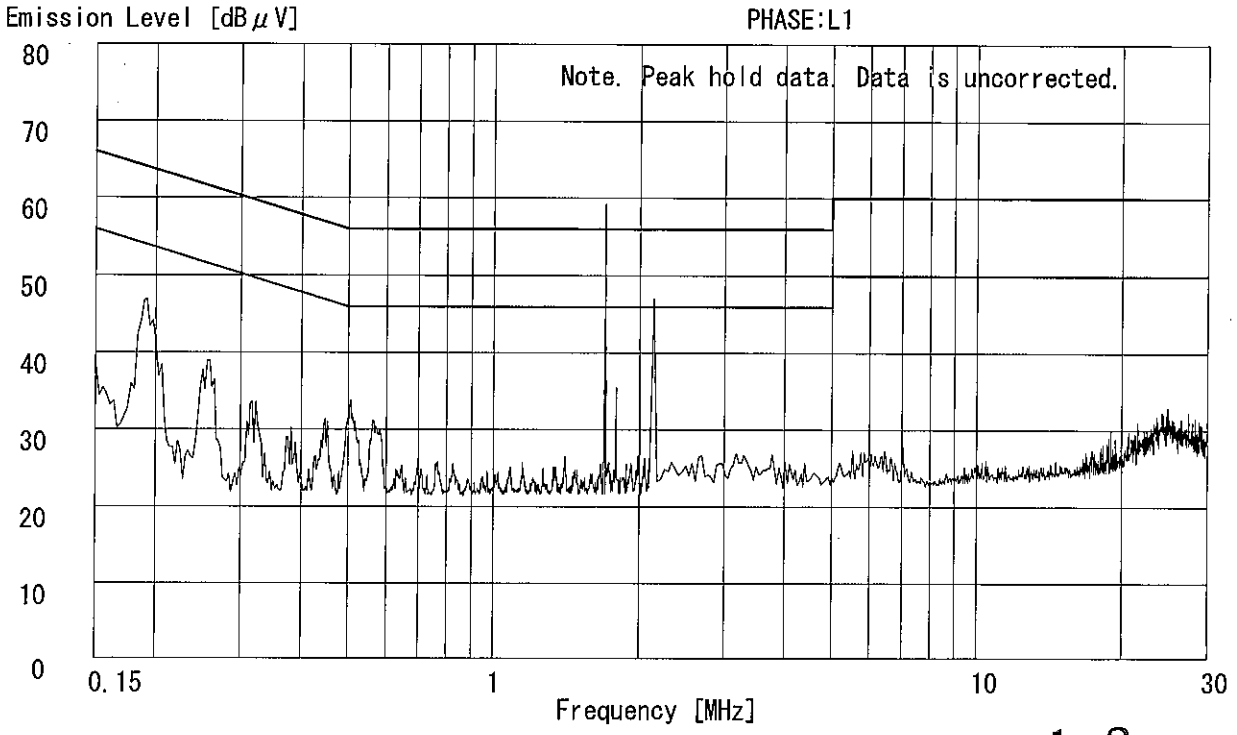


DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.
YAMAKITA No.3 SHIELD TEST ROOM
Report No. : 26BE0140-YK = 1

Applicant	: TOYOTA INDUSTRIES CORPORATION		
Kind of Equipment	: Wireless LAN Module		
Model No.	: 6180110		
Serial No.	: ES0081		
Power	: AC120V/60Hz		
Mode	: Transmitting:ch6(2437MHz)		
Remarks	: ANTB24-043A0		
Date	: 9/22/2005		
Phase	: Single Phase		
Temperature	: 23 ℃	Engineer	: Takahiro Suzuki
Humidity	: 64 %		
Regulation 1	: FCC Part15C §15.207.(CISPR Pub.22)		
Regulation 2	: FCC Part15C §15.207.(CISPR Pub.22)		





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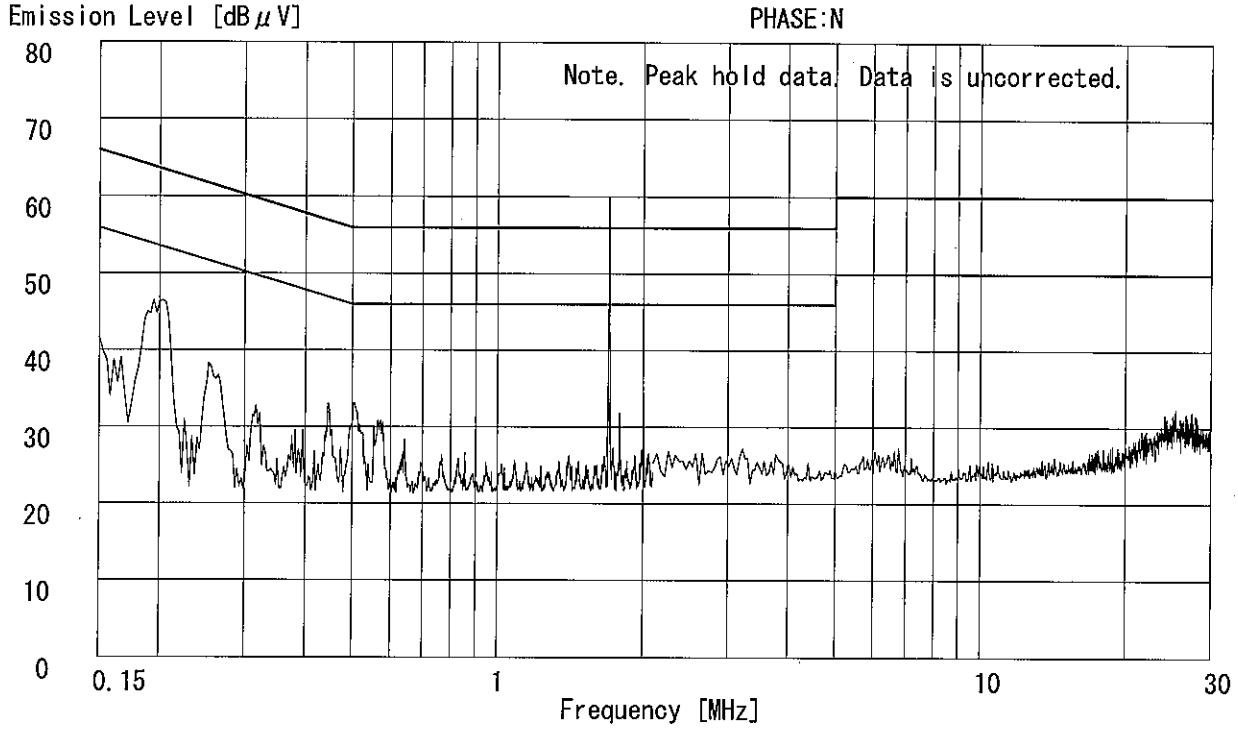
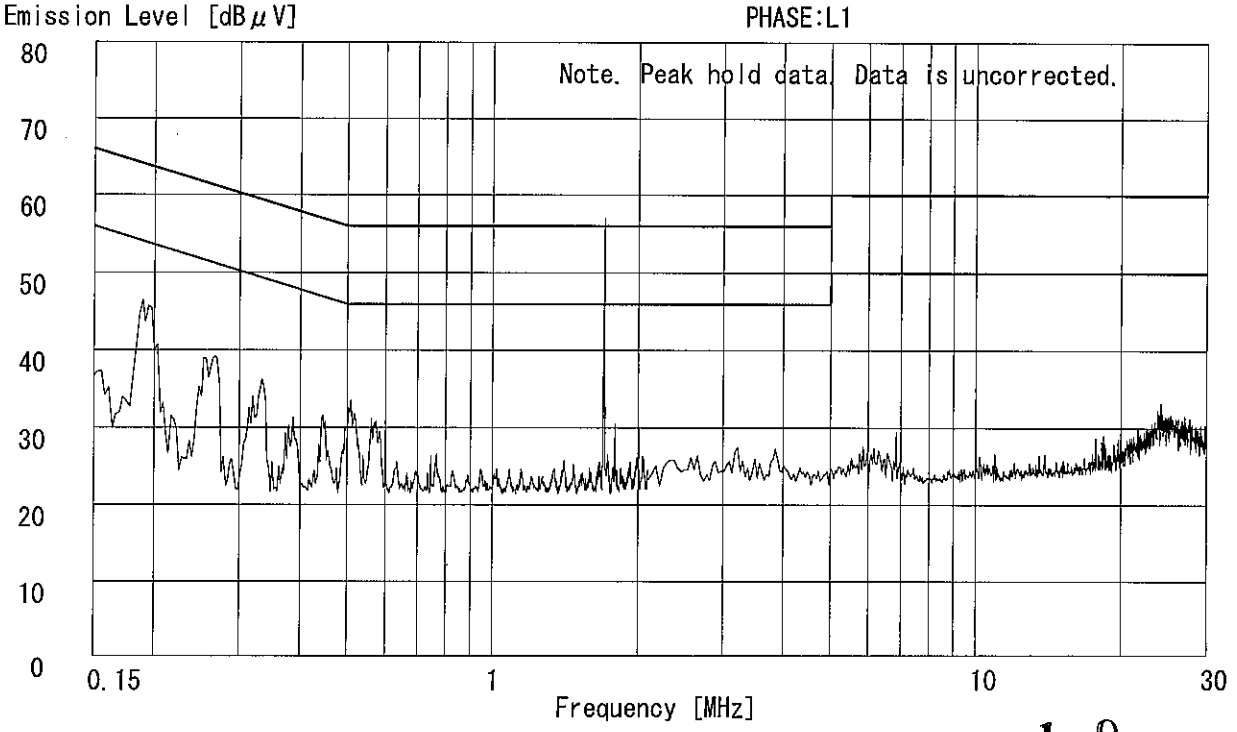
Temperature	: 23 ℃	Engineer	: Takahiro Suzuki
Humidity	: 64 %		
Regulation 1	: FCC Part15C §15.207.(CISPR Pub.22)		
Regulation 2	: FCC Part15C §15.207.(CISPR Pub.22)		





DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No. : 26BE0140-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180110
Serial No. : ES0081
Power : DC3.3V
Mode : Transmitting:ch1(2412MHz)
Remarks : ANTB24-043A0
Date : 9/22/2005
Test Distance : 3 m
Temperature : 22 ℃ Engineer : Takahiro Suzuki
Humidity : 69 %
Regulation : FCC Part15C §15.209

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	176.00	BB	42.0	34.1	16.3	27.6	2.8	6.0	39.5	31.6	43.5	4.0	11.9
2.	187.00	BB	44.5	38.1	16.7	27.6	2.9	6.0	42.5	36.1	43.5	1.0	7.4
3.	209.02	BB	39.7	32.5	17.2	27.5	3.0	6.0	38.4	31.2	43.5	5.1	12.3
4.	220.02	BB	43.1	35.1	17.2	27.4	3.1	6.0	42.0	34.0	46.0	4.0	12.0
5.	240.00	BB	35.7	28.5	17.3	27.0	3.3	6.0	35.3	28.1	46.0	10.7	17.9
6.	308.01	BB	41.4	38.2	14.6	27.4	3.8	6.0	38.4	35.2	46.0	7.6	10.8
7.	332.97	BB	36.0	42.1	15.3	27.5	4.0	6.0	33.8	39.9	46.0	12.2	6.1
8.	432.00	BB	40.9	41.4	17.5	28.1	4.6	6.0	40.9	41.4	46.0	5.1	4.6
9.	499.62	BB	35.2	41.6	18.5	28.4	5.0	6.0	36.3	42.7	46.0	9.7	3.3
10.	665.72	BB	37.4	30.7	20.2	28.7	5.8	6.0	40.7	34.0	46.0	5.3	12.0
11.	734.38	BB	30.8	29.2	20.4	28.9	6.1	6.0	34.4	32.8	46.0	11.6	13.2

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

■ANTENNA:KBA-02(BBA9106)30-299MHz/KLA-02(USLP9143)300-1000MHz
■AMP:KAF-03(8447D) ■RECEIVER:KTR-04(ESVS10) ■CABLE:KCC-20/21/22/23/29

DATA OF RADIATION TEST

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Test Distance	: 3 m		
Temperature	: 22 ℃	Engineer	: Takahiro Suzuki
Humidity	: 69 %		
Regulation	: FCC Part15C §15.209		

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	176.00	BB	42.1	33.8	16.3	27.6	2.8	6.0	39.6	31.3	43.5	3.9	12.2
2.	187.00	BB	44.3	37.8	16.7	27.6	2.9	6.0	42.3	35.8	43.5	1.2	7.7
3.	209.02	BB	39.8	32.6	17.2	27.5	3.0	6.0	38.5	31.3	43.5	5.0	12.2
4.	220.02	BB	43.0	34.7	17.2	27.4	3.1	6.0	41.9	33.6	46.0	4.1	12.4
5.	240.00	BB	35.7	28.6	17.3	27.0	3.3	6.0	35.3	28.2	46.0	10.7	17.8
6.	308.01	BB	41.4	38.0	14.6	27.4	3.8	6.0	38.4	35.0	46.0	7.6	11.0
7.	332.97	BB	35.9	42.2	15.3	27.5	4.0	6.0	33.7	40.0	46.0	12.3	6.0
8.	432.00	BB	40.8	41.4	17.5	28.1	4.6	6.0	40.8	41.4	46.0	5.2	4.6
9.	499.62	BB	35.3	41.2	18.5	28.4	5.0	6.0	36.4	42.3	46.0	9.6	3.7
10.	665.72	BB	37.4	30.8	20.2	28.7	5.8	6.0	40.7	34.1	46.0	5.3	11.9
11.	734.38	BB	30.6	29.8	20.4	28.9	6.1	6.0	34.2	33.4	46.0	11.8	12.6

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

■ANTENNA:KBA-02(BBA9106)30-299MHz/KLA-02(USLP9143)300-1000MHz
■AMP:KAF-03(8447D) ■RECEIVER:KTR-04(ESVS10) ■CABLE:KCC-20/21/22/23/29

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No. : 26BE0140-YK-1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180110
Serial No. : ES0081
Power : DC3.3V
Mode : Transmitting:ch11(2462MHz)
Remarks : ANTB24-043A0
Date : 9/22/2005
Test Distance : 3 m
Temperature : 22 ℃ Engineer : Takahiro Suzuki
Humidity : 69 %
Regulation : FCC Part15C §15.209

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	176.00	BB	41.9	34.2	16.3	27.6	2.8	6.0	39.4	31.7	43.5	4.1	11.8
2.	187.00	BB	44.5	39.4	16.7	27.6	2.9	6.0	42.5	37.4	43.5	1.0	6.1
3.	209.02	BB	39.8	32.6	17.2	27.5	3.0	6.0	38.5	31.3	43.5	5.0	12.2
4.	220.02	BB	43.2	34.6	17.2	27.4	3.1	6.0	42.1	33.5	46.0	3.9	12.5
5.	240.00	BB	35.6	29.1	17.3	27.0	3.3	6.0	35.2	28.7	46.0	10.8	17.3
6.	308.01	BB	41.3	38.4	14.6	27.4	3.8	6.0	38.3	35.4	46.0	7.7	10.6
7.	332.97	BB	36.1	42.2	15.3	27.5	4.0	6.0	33.9	40.0	46.0	12.1	6.0
8.	432.00	BB	40.7	41.5	17.5	28.1	4.6	6.0	40.7	41.5	46.0	5.3	4.5
9.	499.62	BB	35.4	41.0	18.5	28.4	5.0	6.0	36.5	42.1	46.0	9.5	3.9
10.	665.72	BB	37.6	30.9	20.2	28.7	5.8	6.0	40.9	34.2	46.0	5.1	11.8
11.	734.38	BB	30.5	29.7	20.4	28.9	6.1	6.0	34.1	33.3	46.0	11.9	12.7

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

■ANTENNA:KBA-02(BBA9106)30-299MHz/KLA-02(USLP9143)300-1000MHz
■AMP:KAF-03(8447D) ■RECEIVER:KTR-04(ESVS10) ■CABLE:KCC-20/21/22/23/29

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No.: 26BE0140-YK - 1

Applicant	: TOYOTA INDUSTRIES CORPORATION		
Kind of Equipment	: Wireless LAN Module		
Model No.	: 6180110		
Serial No.	: ES0081		
Power	: DC3.3V		
Mode	: Transmitting:ch1(2412MHz)		
Remarks	: ANTB24-043A0		
Date	: 9/22/2005		
Test Distance	: 3 m		
Temperature	: 22 ℃	Engineer	: Takahiro Suzuki
Humidity	: 69 %		
Regulation	: FCC Part15C §15.209(PK Detection)		

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	1199.00	BB	49.3	49.6	25.3	35.9	2.9	10.1	51.7	52.0	74.0	22.3	22.0
2.	2390.00	BB	45.5	46.1	27.7	34.6	4.0	10.0	52.6	53.2	74.0	21.4	20.8
3.	4824.00	BB	45.0	45.1	32.1	34.0	5.5	0.5	49.1	49.2	74.0	24.9	24.8
4.	7236.00	BB	39.8	39.5	36.6	34.3	6.6	0.2	48.9	48.6	74.0	25.1	25.4
5.	9648.00	BB	43.6	43.2	38.9	34.9	7.4	0.4	55.4	55.0	74.0	18.6	19.0
6.	12060.00	BB	40.8	40.9	39.8	34.3	8.2	0.0	54.5	54.6	74.0	19.5	19.4
7.	14472.00	BB	41.7	41.3	42.4	33.9	8.9	0.3	59.4	59.0	74.0	14.6	15.0
8.	16884.00	BB	42.5	42.6	40.7	34.6	9.6	0.6	58.8	58.9	74.0	15.2	15.1
9.	19296.00	BB	43.8	44.1	38.6	33.8	10.3	0.0	58.9	59.2	74.0	15.1	14.8
10.	21708.00	BB	43.2	44.1	39.0	34.1	10.7	0.0	58.8	59.7	74.0	15.2	14.3
11.	24120.00	BB	42.7	42.5	39.3	31.9	11.1	0.0	61.2	61.0	74.0	12.8	13.0

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

■ANTENNA:KHA-02(1-18GHz)/KHA-04(18-26GHz)
■AMP:KAF-04(8449B) ■SPECTRUM ANALYZER:KSA-04(R3371A) ■CABLE:KCC-D3/D7

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No.: 26BE0140-YK - 1

Applicant	:	TOYOTA INDUSTRIES CORPORATION	
Kind of Equipment	:	Wireless LAN Module	
Model No.	:	6180110	
Serial No.	:	ES0081	
Power	:	DC3.3V	
Mode	:	Transmitting:ch1(2412MHz)	
Remarks	:	ANTB24-043A0	
Date	:	9/22/2005	
Test Distance	:	3 m	
Temperature	:	22 ℃	Engineer : Takahiro Suzuki
Humidity	:	69 %	
Regulation	:	FCC Part15C §15.209(AV Detection)	

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	1199.00	BB	36.6	36.7	25.3	35.9	2.9	10.1	39.0	39.1	54.0	15.0	14.9
2.	2390.00	BB	34.6	35.5	27.7	34.6	4.0	10.0	41.7	42.6	54.0	12.3	11.4
3.	4824.00	BB	39.8	40.3	32.1	34.0	5.5	0.5	43.9	44.4	54.0	10.1	9.6
4.	7236.00	BB	28.1	27.8	36.6	34.3	6.6	0.2	37.2	36.9	54.0	16.8	17.1
5.	9648.00	BB	34.8	33.6	38.9	34.9	7.4	0.4	46.6	45.4	54.0	7.4	8.6
6.	12060.00	BB	28.6	28.9	39.8	34.3	8.2	0.0	42.3	42.6	54.0	11.7	11.4
7.	14472.00	BB	29.7	29.8	42.4	33.9	8.9	0.3	47.4	47.5	54.0	6.6	6.5
8.	16884.00	BB	30.8	30.7	40.7	34.6	9.6	0.6	47.1	47.0	54.0	6.9	7.0
9.	19296.00	BB	32.6	31.7	38.6	33.8	10.3	0.0	47.7	46.8	54.0	6.3	7.2
10.	21708.00	BB	32.5	33.7	39.0	34.1	10.7	0.0	48.1	49.3	54.0	5.9	4.7
11.	24120.00	BB	32.2	32.0	39.3	31.9	11.1	0.0	50.7	50.5	54.0	3.3	3.5

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

■ANTENNA:KHA-02(1-18GHz)/KHA-04(18-26GHz)
■AMP:KAF-04(8449B) ■SPECTRUM ANALYZER:KSA-04(R3371A) ■CABLE:KCC-D3/D7

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No. : 26BE0140-YK-1

Applicant	: TOYOTA INDUSTRIES CORPORATION		
Kind of Equipment	: Wireless LAN Module		
Model No.	: 6180110		
Serial No.	: ES0081		
Power	: DC3.3V		
Mode	: Transmitting:ch6(2437MHz)		
Remarks	: ANTB24-043A0		
Date	: 9/22/2005		
Test Distance	: 3 m		
Temperature	: 22 ℃	Engineer	: Takahiro Suzuki
Humidity	: 69 %		
Regulation	: FCC Part15C §15.209(PK Detection)		

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	1199.00	BB	49.2	49.3	25.3	35.9	2.9	10.1	51.6	51.7	74.0	22.4	22.3
2.	4874.00	BB	44.4	43.6	32.2	34.0	5.5	0.5	48.6	47.8	74.0	25.4	26.2
3.	7311.00	BB	39.9	39.1	36.7	34.3	6.7	0.2	49.2	48.4	74.0	24.8	25.6
4.	9748.00	BB	42.8	42.0	39.0	34.9	7.4	0.3	54.6	53.8	74.0	19.4	20.2
5.	12185.00	BB	39.2	39.1	39.6	34.2	8.2	0.0	52.8	52.7	74.0	21.2	21.3
6.	14622.00	BB	40.7	41.6	42.1	34.0	8.9	0.4	58.1	59.0	74.0	15.9	15.0
7.	17059.00	BB	40.9	40.8	41.1	34.6	9.7	0.6	57.7	57.6	74.0	16.3	16.4
8.	19496.00	BB	42.5	41.7	38.4	34.3	10.5	0.0	57.1	56.3	74.0	16.9	17.7
9.	21933.00	BB	43.1	43.1	39.1	33.9	10.8	0.0	59.1	59.1	74.0	14.9	14.9
10.	24370.00	BB	42.3	42.6	39.4	32.9	11.1	0.0	59.9	60.2	74.0	14.1	13.8

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

■ANTENNA:KHA-02(1-18GHz)/KHA-04(18-26GHz)
■AMP:KAF-04(8449B) ■SPECTRUM ANALYZER:KSA-04(R3371A) ■CABLE:KCC-D3/D7

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No.: 26BE0140-YK ~ 1

Applicant	: TOYOTA INDUSTRIES CORPORATION		
Kind of Equipment	: Wireless LAN Module		
Model No.	: 6180110		
Serial No.	: ES0081		
Power	: DC3.3V		
Mode	: Transmitting:ch6(2437MHz)		
Remarks	: ANTB24-043A0		
Date	: 9/22/2005		
Test Distance	: 3 m		
Temperature	: 22 ℃	Engineer	: Takahiro Suzuki
Humidity	: 69 %		
Regulation	: FCC Part15C §15.209(AV Detection)		

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	1199.00	BB	36.4	36.8	25.3	35.9	2.9	10.1	38.8	39.2	54.0	15.2	14.8
2.	4874.00	BB	39.9	38.5	32.2	34.0	5.5	0.5	44.1	42.7	54.0	9.9	11.3
3.	7311.00	BB	28.2	27.9	36.7	34.3	6.7	0.2	37.5	37.2	54.0	16.5	16.8
4.	9748.00	BB	33.6	33.4	39.0	34.9	7.4	0.3	45.4	45.2	54.0	8.6	8.8
5.	12185.00	BB	29.1	29.2	39.6	34.2	8.2	0.0	42.7	42.8	54.0	11.3	11.2
6.	14622.00	BB	29.6	29.6	42.1	34.0	8.9	0.4	47.0	47.0	54.0	7.0	7.0
7.	17059.00	BB	29.4	29.4	41.1	34.6	9.7	0.6	46.2	46.2	54.0	7.8	7.8
8.	19496.00	BB	32.2	31.6	38.4	34.3	10.5	0.0	46.8	46.2	54.0	7.2	7.8
9.	21933.00	BB	33.4	33.6	39.1	33.9	10.8	0.0	49.4	49.6	54.0	4.6	4.4
10.	24370.00	BB	32.0	32.1	39.4	32.9	11.1	0.0	49.6	49.7	54.0	4.4	4.3

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

■ANTENNA:KHA-02(1-18GHz)/KHA-04(18-26GHz)
■AMP:KAF-04(8449B) ■SPECTRUM ANALYZER:KSA-04(R3371A) ■CABLE:KCC-D3/D7

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No.: 26BE0140-YK-1

Applicant	: TOYOTA INDUSTRIES CORPORATION
Kind of Equipment	: Wireless LAN Module
Model No.	: 6180110
Serial No.	: ES0081
Power	: DC3.3V
Mode	: Transmitting:ch11(2462MHz)
Remarks	: ANTB24-043A0
Date	: 9/22/2005
Test Distance	: 3 m
Temperature	: 22 ℃ Engineer : Takahiro Suzuki
Humidity	: 69 %
Regulation	: FCC Part15C §15.209(PK Detection)

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	1199.00	BB	49.4	49.6	25.3	35.9	2.9	10.1	51.8	52.0	74.0	22.2	22.0
2.	2483.50	BB	46.8	47.9	28.0	34.6	4.0	10.0	54.2	55.3	74.0	19.8	18.7
3.	4924.00	BB	44.1	45.7	32.3	34.0	5.6	0.5	48.5	50.1	74.0	25.5	23.9
4.	7386.00	BB	45.2	39.8	36.8	34.3	6.7	0.2	54.6	49.2	74.0	19.4	24.8
5.	9848.00	BB	44.8	43.7	39.2	34.8	7.4	0.2	56.8	55.7	74.0	17.2	18.3
6.	12310.00	BB	39.9	40.8	39.3	34.1	8.1	0.0	53.2	54.1	74.0	20.8	19.9
7.	14772.00	BB	42.0	40.7	41.6	34.2	9.0	0.6	59.0	57.7	74.0	15.0	16.3
8.	17234.00	BB	42.7	42.1	41.6	34.7	9.6	0.3	59.5	58.9	74.0	14.5	15.1
9.	19696.00	BB	42.8	42.0	38.4	34.2	10.5	0.0	57.5	56.7	74.0	16.5	17.3
10.	22158.00	BB	42.7	43.1	39.2	33.4	11.0	0.0	59.5	59.9	74.0	14.5	14.1
11.	24620.00	BB	42.2	42.5	39.4	33.5	11.3	0.0	59.4	59.7	74.0	14.6	14.3

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

■ANTENNA:KHA-02(1-18GHz)/KHA-04(18-26GHz)
■AMP:KAF-04(8449B) ■SPECTRUM ANALYZER:KSA-04(R3371A) ■CABLE:KCC-D3/D7

DATA OF RADIATION TEST

UL Apex Co.,Ltd.
Yamakita No.2 Open Test Site
Report No.: 26BE0140-YK - 1

Applicant : TOYOTA INDUSTRIES CORPORATION
Kind of Equipment : Wireless LAN Module
Model No. : 6180110
Serial No. : ES0081
Power : DC3.3V
Mode : Transmitting:ch11(2462MHz)
Remarks : ANTB24-043A0
Date : 9/22/2005
Test Distance : 3 m
Temperature : 22 ℃ Engineer : Takahiro Suzuki
Humidity : 69 %
Regulation : FCC Part15C §15.209(AV Detection)

No.	FREQ. [MHz]	ANT TYPE	READING HOR [dBμV]	READING VER [dBμV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR [dBμV/m]	RESULT VER [dBμV/m]	LIMITS [dBμV/m]	MARGIN HOR [dB]	MARGIN VER [dB]
1.	1199.00	BB	36.5	36.7	25.3	35.9	2.9	10.1	38.9	39.1	54.0	15.1	14.9
2.	2483.50	BB	34.2	34.8	28.0	34.6	4.0	10.0	41.6	42.2	54.0	12.4	11.8
3.	4924.00	BB	37.7	40.9	32.3	34.0	5.6	0.5	42.1	45.3	54.0	11.9	8.7
4.	7386.00	BB	39.2	27.6	36.8	34.3	6.7	0.2	48.6	37.0	54.0	5.4	17.0
5.	9848.00	BB	36.2	33.5	39.2	34.8	7.4	0.2	48.2	45.5	54.0	5.8	8.5
6.	12310.00	BB	29.0	28.9	39.3	34.1	8.1	0.0	42.3	42.2	54.0	11.7	11.8
7.	14772.00	BB	29.8	29.7	41.6	34.2	9.0	0.6	46.8	46.7	54.0	7.2	7.3
8.	17234.00	BB	29.7	30.8	41.6	34.7	9.6	0.3	46.5	47.6	54.0	7.5	6.4
9.	19696.00	BB	32.3	31.8	38.4	34.2	10.5	0.0	47.0	46.5	54.0	7.0	7.5
10.	22158.00	BB	32.8	33.2	39.2	33.4	11.0	0.0	49.6	50.0	54.0	4.4	4.0
11.	24620.00	BB	32.2	32.1	39.4	33.5	11.3	0.0	49.4	49.3	54.0	4.6	4.7

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

■ANTENNA:KHA-02(1-18GHz)/KHA-04(18-26GHz)
■AMP:KAF-04(8449B) ■SPECTRUM ANALYZER:KSA-04(R3371A) ■CABLE:KCC-D3/D7

Test Report No :26BE0140-YK-1

APPENDIX 3
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No.	Test Item	Calibration Date * Interval(month)
KAF-03	Pre Amplifier	Hewlett Packard	8447D	RE	2005/09/09 * 12
KAF-04	Pre Amplifier	Agilent	8449B	RE	2005/04/28 * 12
KAT10-S1	Attenuator	Agilent	8449D 010	RE	2005/04/12 * 12
KAT6-04	Attenuator	INMET	18N-6dB	RE	2005/04/07 * 12
KBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/07/29 * 12
KCC-20/21/22/23/29	Coaxial Cable	Fujikura/Suhner	8D-2W/12D-SFA/S04272B/S04272B	RE	2005/09/02 * 12
KCC-24/25/26/28/KPL-02	Coaxial Cable/Pulse Limitter	Fujikura/Suhner/PMM	5D-2W/5D-2W/S04272B/S04272B/PL01	CE	2005/09/02 * 12
KCC-D3/D7	Coaxial Cable	Rosenberger/Advantest	2201/JUN-08-01-061	RE	2005/04/12 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2005/04/12 * 12
KHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/09/25 * 12
KHA-04	Horn Antenna	EMCO	3160-09	RE	2005/05/14 * 12
KLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/07/29 * 12
KLS-05	LISN(AMN)	Schwarzbeck	NSLK8126	CE	2005/09/06 * 12
KOTS-02	Open Test Site	JSE	10m	RE	2005/08/07 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	CE/RE	2005/09/13 * 12
KTR-03	Test Receiver	Rohde & Schwarz	ESHS10	CE	2005/05/11 * 12
KTR-04	Test Receiver	Rohde & Schwarz	ESVS10	RE	2004/10/18 * 12

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

Test Item:

CE: Conducted emission,

RE: Radiated emission