EMI TEST REPORT

Test Report No. : 26GE0141-YK

Applicant	:	**Alps Electric Co., Ltd.**
Type of Equipment	:	**Passive Entry System (Tuner)**
Model No.	:	**TWC1U240**
FCC ID	:	**CWTWCU240**
Test Standard	:	**FCC Part15 Subpart B**
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: February 22, 2006

Tested by: T. Imamura
Toyokazu Imamura

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

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1 Applicant Information

Company Name	:	Alps Electric Co., Ltd.
Address	:	6-3-36 Nakazato, Furukawa-shi, Miyagi-ken, 989-6181 JAPAN
Telephone Number	:	+81-229-23-5111
Facsimile Number	:	+81-229-23-3755
Contact Person	:	Katsuhiro Seino

2 Product Description

Type of Equipment	:	Passive Entry System (Tuner)
Model No.	:	TWC1U240
Serial No.	:	512AB33A
Rating :	:	DC12V (Car Battery)
Country of Manufacture	:	Japan
Receipt Date of Sample	:	February 20, 2006
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)

Model: TWC1U240 (referred to as the EUT in this report) is a RF signal tuner unit. The Passive Entry System is a system which locks, unlocks and can start engine only with the intelligent-key of the vehicle.

Frequency of operation	:	315MHz
Intermediate frequency	:	10.7MHz
Local frequency	:	325.7MHz
Other clock frequency	:	65.14MHz (Crystal)
Type of receiver	:	Super Heterodyne
Antenna type	:	Internal Bar antenna
Antenna connector type	:	None
Operation temperature range	:	-40 ~ +80 deg. C.

3 Test Specification, Procedures and Results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2006
Title : FCC 47CFR Part 15 Radio Frequency Device Subpart B Unintentional Radiators

3.2 Procedures & Results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	CISPR 22	N/A *1	N/A	N/A
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	FCC §15.109(a)	N/A	16.1dB (651.40MHz, Horizontal)	Complied
Antenna power conduction for receivers	ANSI C63.4: 2003 12.1.5 Antenna-conducted power measurements	FCC §15.111(a)	N/A *2	N/A	N/A

*1) The test is not applicable since the EUT has no AC mains.
*2) The test is not applicable to the EUT since the EUT does not have antenna port.

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

3.3 Addition to standard

No addition, deviation or exclusion has been made from the standard.

3.4 Uncertainty

Radiated emission
The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is ±4.5dB.
The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is ±4.3dB.
The data listed in this test report has enough margin, more than site margin.

3.5 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 August 26, 2005 (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 2, 2005 (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

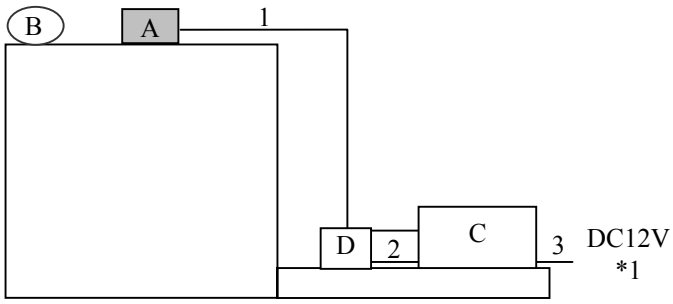
4.1 Justification

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

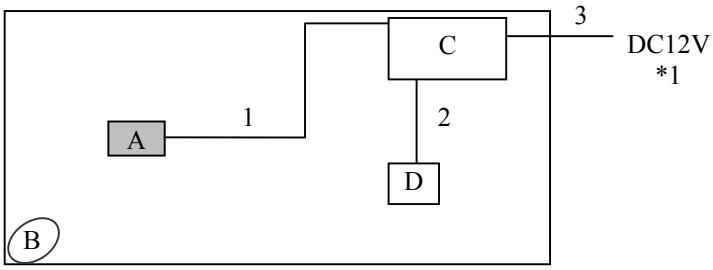
Test mode: Receiving mode

4.2 Configuration of Tested System

Front View



Top View



* 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	Passive Entry System (Tuner)	TWC1U240	512AB33A	Alps Electric Co., Ltd.	CWTWCU240 (EUT)
B	Passive Entry System (Hand Unit)	TWB1U735	-	Alps Electric Co., Ltd.	-
C	Checker Box	-	-	Alps Electric Co., Ltd.	-
D	Passive Entry System (Control Unit)	TWD1U630	WD1U630A	Alps Electric Co., Ltd.	-

*1) DC Power Supply (Model No.: PAN35-10A) was used for DC 12V input.

List of cables used

No.	Name	Length (m)	Shield	Remark
1	Tuner Signal and DC cable	1.0	Unshielded	-
2	Cable for Control Unit	2.0	Shielded	-
3	DC cable	1.9	Unshielded	-

5 Radiated Emissions

5.1 Operating environment

The test was carried out in No.1 open site.

5.2 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.

5.3 Test conditions

Frequency range : 30MHz - 1GHz
Test distance : 3m
EUT operation mode : Receiving

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on an open test site with a ground plane and at a distance of 3m. Pre check measurements were performed in a screened room with a search coil at 30-1000MHz to distinguish disturbances of EUT from the ambient noise. Measurements were performed with a quasi-peak detector. 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.
The radiated emission measurements were made with the following detector function of the test receiver.

Detector Type : Quasi-Peak
IF Bandwidth : 120kHz

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 10.
With the position, the noise levels of all the frequencies were measured.

Antenna: Horizontal	Z
Antenna: Vertical	Z

5.5 Results

Summary of the test results : Pass
Test data : APPENDIX 2 Page 11 to 12

Date : February 22, 2006 Test engineer : Toyokazu Imamura

APPENDIX 1: Photographs of test setup

Page 9 : Radiated emission

Page 10 : Pre-check of the worst position

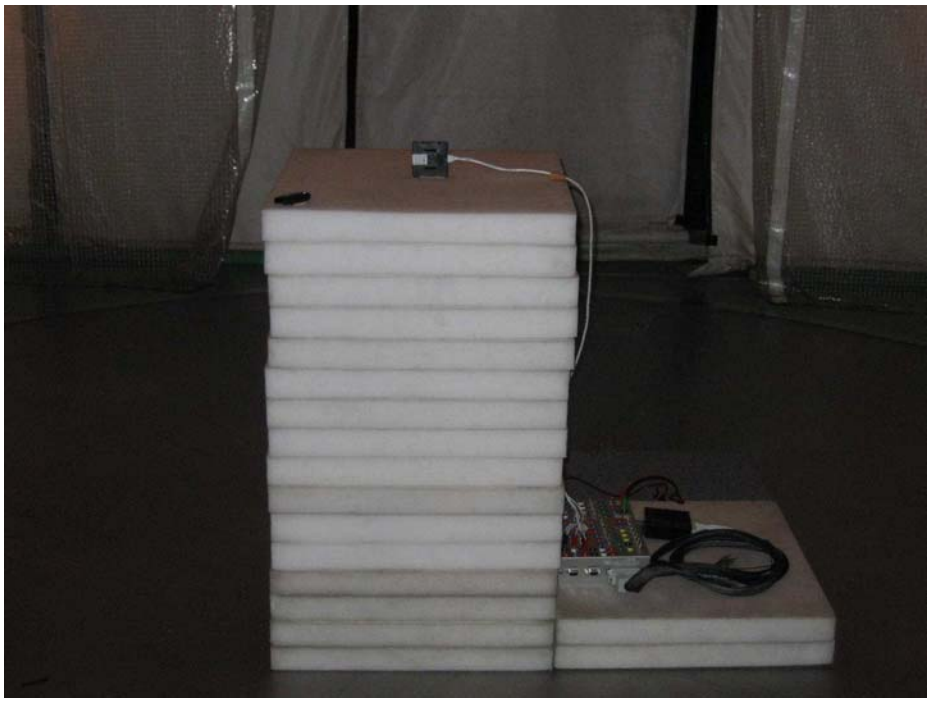
APPENDIX 2: Test Data

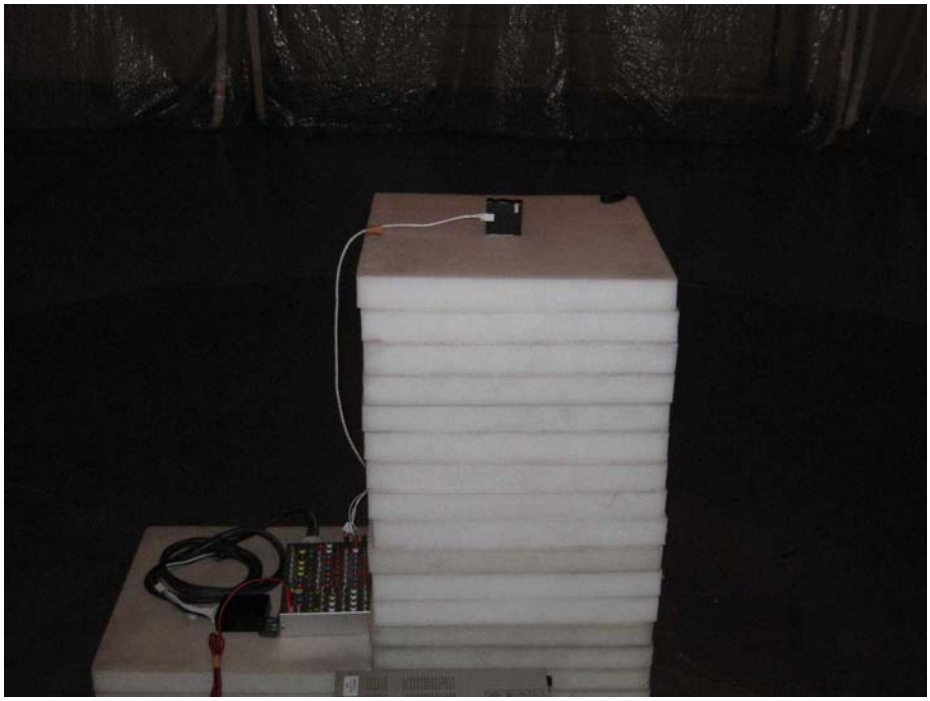
Page 11 - 12 : Radiated emission

APPENDIX 3: Test instruments

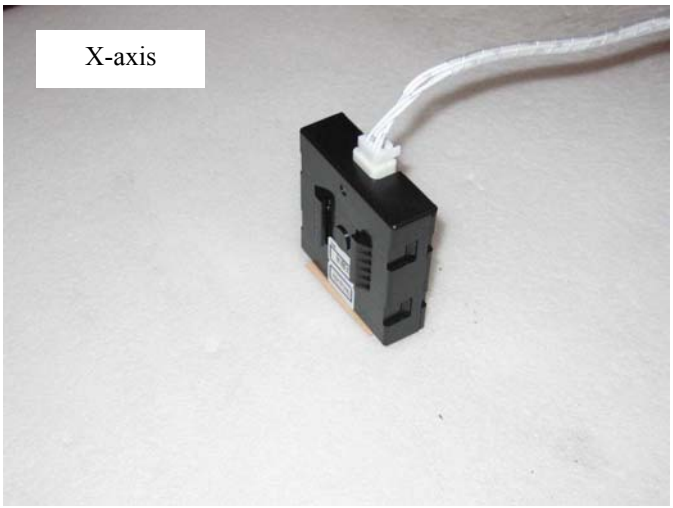
Page 13 : Test instruments

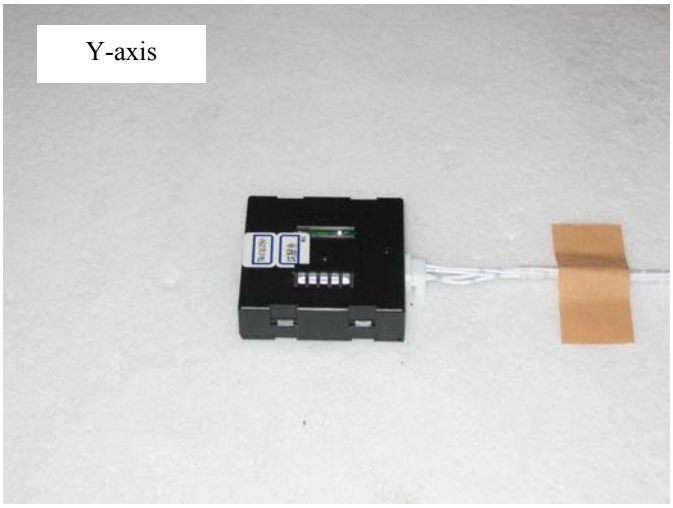
Radiated emission

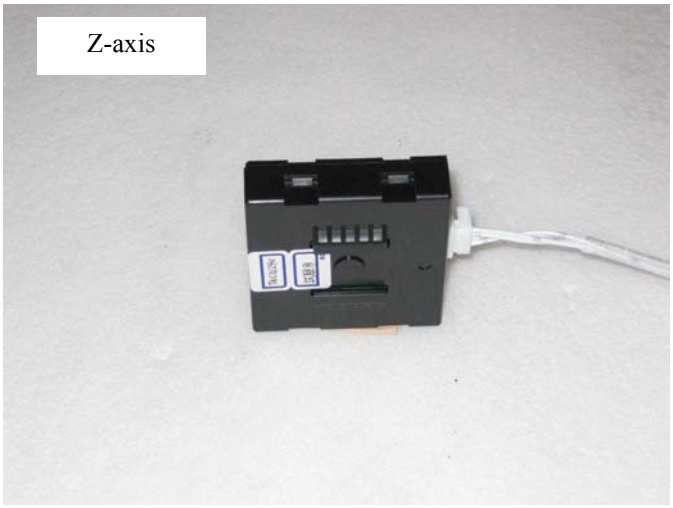




Pre-check of worst position







DATA OF RADIATION TEST

UL Apex Co.,Ltd.
YAMAKITA No.1 OPEN TEST SITE
Report No.: 26GE0141-YK

Applicant	:	Alps Electric CO., Ltd.	
Kind of Equipment	:	Passive Entry System (TUNER)	
Model No.	:	TWCIU240	
Serial No.	:	512AB33A	
Power	:	DC12V	
Mode	:	Receiving	
Remarks	:		
Date	:	2/22/2006	
Test Distance	:	3 m	
Temperature	:	18 ℃	Engineer : Toyokazu Imamura
Humidity	:	46 %	
Regulation	:	FCC Part15B §15.109(a)	

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.	54.60	BB	22.3	32.8	9.0	28.4	1.9	6.0	10.8	21.3	40.0	29.2	18.7
2.	65.14	BB	24.6	28.2	7.2	28.4	2.0	6.0	11.4	15.0	40.0	28.6	25.0
3.	130.28	BB	20.9	21.1	13.7	28.2	3.0	6.0	15.4	15.6	43.5	28.1	27.9
4.	325.71	BB	28.4	25.4	15.3	27.9	5.0	6.0	26.8	23.8	46.0	19.2	22.2
5.	651.40	BB	25.5	22.9	20.2	29.2	7.4	6.0	29.9	27.3	46.0	16.1	18.7
6.	977.10	BB	21.1	21.1	23.1	28.4	9.6	6.0	31.4	31.4	54.0	22.6	22.6

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

■ANTENNA:KBA-01(BBA9106)30-299.99MHz/KLA-01(USLP9143)300-1000MHz
■CABLE:KCC-10/11/12/13/18■PREAMP:KAF-01(8447D) ■EMI RECEIVER:KTR-02(ESCS30)

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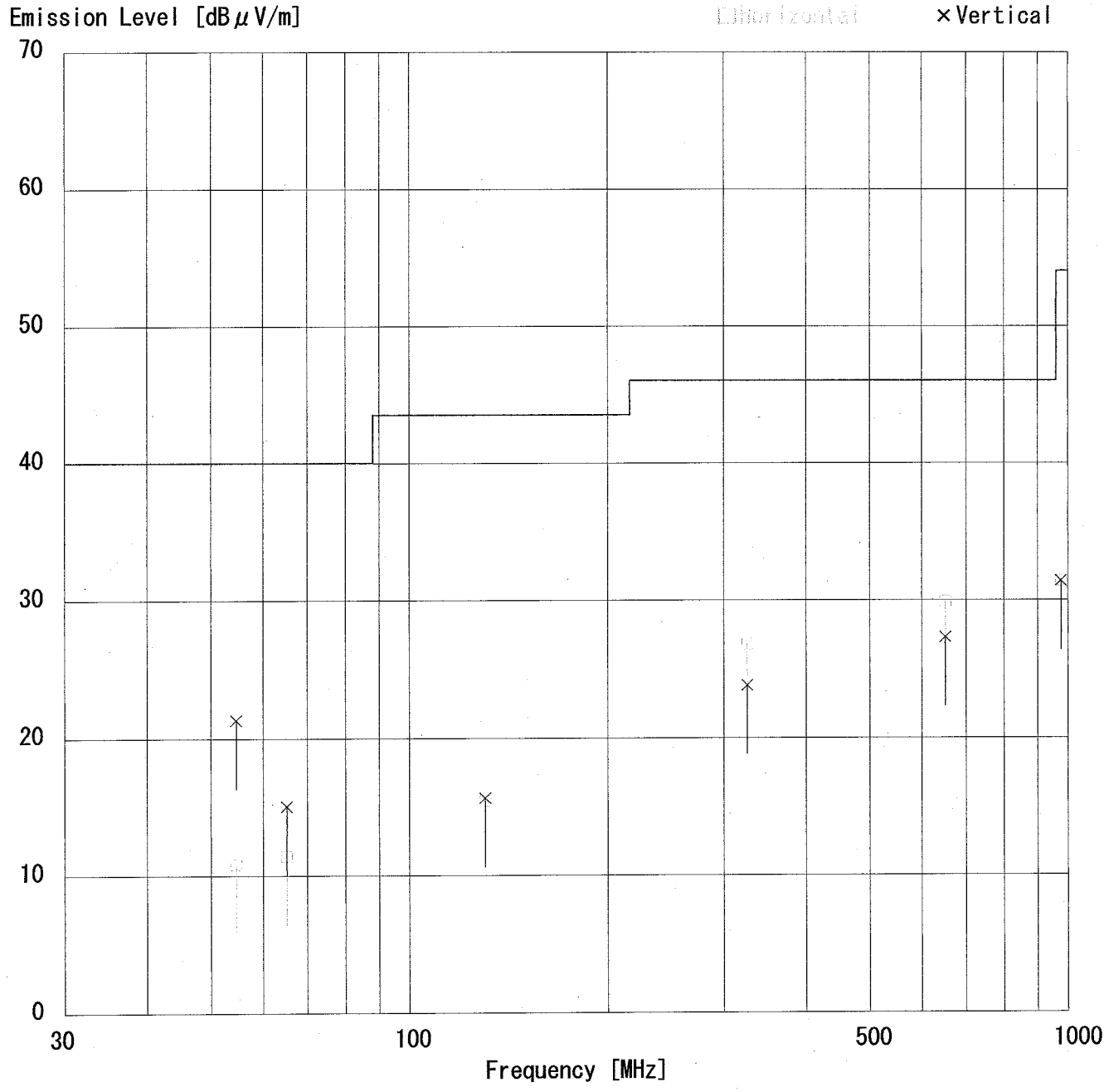
Report No.: 26GE0141-YK

Applicant	: Alps Electric CO., Ltd.		
Kind of Equipment	: Passive Entry System (TUNER)		
Model No.	: TWCIU240		
Serial No.	: 512AB33A		
Power	: DC12V		
Mode	: Receiving		
Remarks	:		
Date	: 2/22/2006		
Test Distance	: 3 m		
Temperature	: 18 ℃	Engineer	: Toyokazu Imamura
Humidity	: 46 %		
Regulation	: FCC Part15B §15.109(a)		



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APPENDIX 3
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
KAF-01	Pre Amplifier	Hewlett Packard	8447D	RE	2005/05/24 * 12
KAT6-02	Attenuator	INMET	18N-6dB	RE	2005/04/07 * 12
KBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/08/04 * 12
KCC-10/11/12/13/18	Coaxial Cable	Fujikura/Suhner	8D-2W/12D-SFA/S04272B/S04272B/S04272B	RE	2005/06/14 * 12
KLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2006/01/17 * 12
KOTS-01	Open Test Site	JSE	30m	RE	2005/08/10 * 12
KSA-01	Spectrum Analyzer	Advantest	R3365	RE	2005/07/06 * 12
KTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2005/11/10 * 12

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