

RADIO TEST REPORT

Test Report No.: 27GE0097-YK-A

Applicant : Alps Electric Co., Ltd.

Type of Equipment : Bluetooth Transceiver Module

Model No. : UGPZ6

FCC ID : CWTUGPZ6


Test Item & Standard: Conducted Emissions
Out of Band Emissions (Radiated)
FCC Part15 Subpart C,
Section 15.207, Section 15.209, Section 15.247: 2006

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 the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test: March 5, 2007

Tested by: 
Fumiaki Matsuo

Approved by: 
Osamu Watatani
Manager of Yamakita EMC Lab.

UL Apex Co., Ltd.

YAMAKITA EMC LAB.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

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MF060b (14.06.06)

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1 Applicant Information

Company Name : Alps Electric Co., Ltd.
Address : 1-7, Yukigaya, Otsuka-cho, Ota-ku, Tokyo, 145-8501 JAPAN
Telephone Number : +81 244 35 1207
Facsimile Number : +81 244 35 1602
Contact Person : Masaaki Ueki

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

2.1 Identification of E.U.T.

Type of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Rating : DC 3.3V
Country of Manufacture : Japan
Receipt Date of Sample : December 29, 2006 (Module), February 10, 2007 (Antenna)
Condition of EUT : Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.

2.2 Product Description

Model: UGPZ6 (referred to as the EUT in this report) is a Bluetooth Transceiver Module.

Equipment type : Transceiver
Frequency of operation : 2402-2480MHz
Clock frequency : 26MHz
Bandwidth & channel spacing : 79MHz & 1MHz
Type of modulation : FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK)
Antenna model & type : 1981566-1 (inverted F)
Antenna gain with cable loss : +1.30dBi
Antenna connector type : U. FL (Hirose)
ITU code : F1D
Operation temperature range : 15 to 35 deg.C.

FCC Part15.31 (e)

Host device (ex. PC) provides the Bluetooth Transceiver Module with stable power supply (DC1.8V), and the power is not changed when voltage of the device is varied. Therefore, the equipment complies power supply regulation.

FCC Part15.203 Antenna requirement

Bluetooth Transceiver Module complies with the requirement. When it is put up for sale, one of the antennas is attached and the antenna is with a unique coupling to the intentional radiator.

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3 Test Specification, Procedures and Results

3.1 Test specification

Test specification : FCC Part15 Subpart C: 2006
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
and 5725-5850MHz

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	7.9dB (0.1596MHz, AV, Tx 2402MHz)	Complied
Carrier Frequency Separation	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)	Conducted	Excluded *1	*See data.	N/A
20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)	Conducted	Excluded *1		N/A
Number of Hopping Frequency	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)(iii)	Conducted	Excluded *1		N/A
Dwell time	ANSI C63.4:2003 13.Measurement of intentional radiators	Section15.247 (a)(1)(iii)	Conducted	Excluded *1		N/A
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (b)(1)	Conducted	Excluded *1		N/A
Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.209 Section15.247 (d)	Conducted / Radiated	N/A	6.2dB (2483.50MHz, AV, Horizontal, Tx 2480MHz)	Complied

The measurements also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

*1) Results for these test items are described in the test reports, 25JE0028-YK-1 and 27DE0019-YK-A. The Module has been certificated with other type antennas.

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

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3.3 Uncertainty

Conducted emission

The measurement uncertainty (with 95% confidence level) for this test is ± 2.7 dB.

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

Spurious emission test (Radiated)

The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is ± 4.5 dB.

The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is ± 4.3 dB.

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

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

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 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	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5	Semi-anechoic chamber	
No.3 shielded room	4.0 x 5.0 x 2.7		

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4 System Test Configuration

4.1 Justification

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

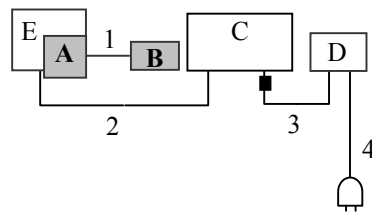
Test mode: Transmitting (Packet size: DH5)
 - Low channel : 2402MHz
 - Middle channel : 2441MHz
 - High channel : 2480MHz

*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

However, the limit level 125mW of AFH mode was used for the test.

4.2 Configuration of Tested System

■: Ferrite core



* Test data was taken under worse case conditions.

AC120V/60Hz

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remarks)
A	Bluetooth Transceiver Module	UGPZ6	4C4E20	ALPS	CWTUGPZ6 (EUT)
B	Antenna	1981566-1	-	Tyco Electronics AMP CO., LTD.	EUT
C	Notebook PC	2626-20J	AA-D1HVZ98/11	IBM	-
D	AC Adapter	83H6340	J14HC56211S	IBM	-
E	Testing Board	-	-	-	-(Test jig)

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Antenna cable	0.08	Shielded	Shielded	-
2	USB cable	1.0	Shielded	Shielded	-
3	DC cable	1.8	Unshielded	Unshielded	-
4	AC cable	1.1	Unshielded	Unshielded	-

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5 Conducted Emissions

5.1 Operating environment

The test was carried out in No.1 shielded room.

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.8m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN) and excess AC cable was bundled in center. 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 hung 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.

An overview sweep with peak detection has been performed.

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

Detector: QP/AV
IF Bandwidth: 9kHz

5.5 Results

Summary of the test results : Pass

Date: March 5, 2007 Test engineer : Fumiaki Matsuo

6 Out of Band Emissions (Radiated)

6.1 Operating environment

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

6.2 Test configuration

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

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.

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

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

The equipment and its antenna were previously checked at each position of three axes X, Y and Z. The position in which the maximum noise occurred was chosen to put into measurement. See the table below and photographs in page 12 to 13. With the position, the noise levels of all the frequencies were measured.

Combinations of the worst case

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

6.5 Results

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

Date: March 5, 2007 Test engineer : Fumiaki Matsuo

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APPENDIX 1: Photographs of test setup

Page 10 : Conducted emission
Page 11 : Radiated emission
Page 12 - 13 : Pre check of worse-case position

APPENDIX 2: Test Data

Page 14 - 18 : Conducted emission
Page 19 - 27 : Out of Band Emissions (Radiated)

APPENDIX 3: Test instruments

Page 28 : Test instruments

Conducted emission



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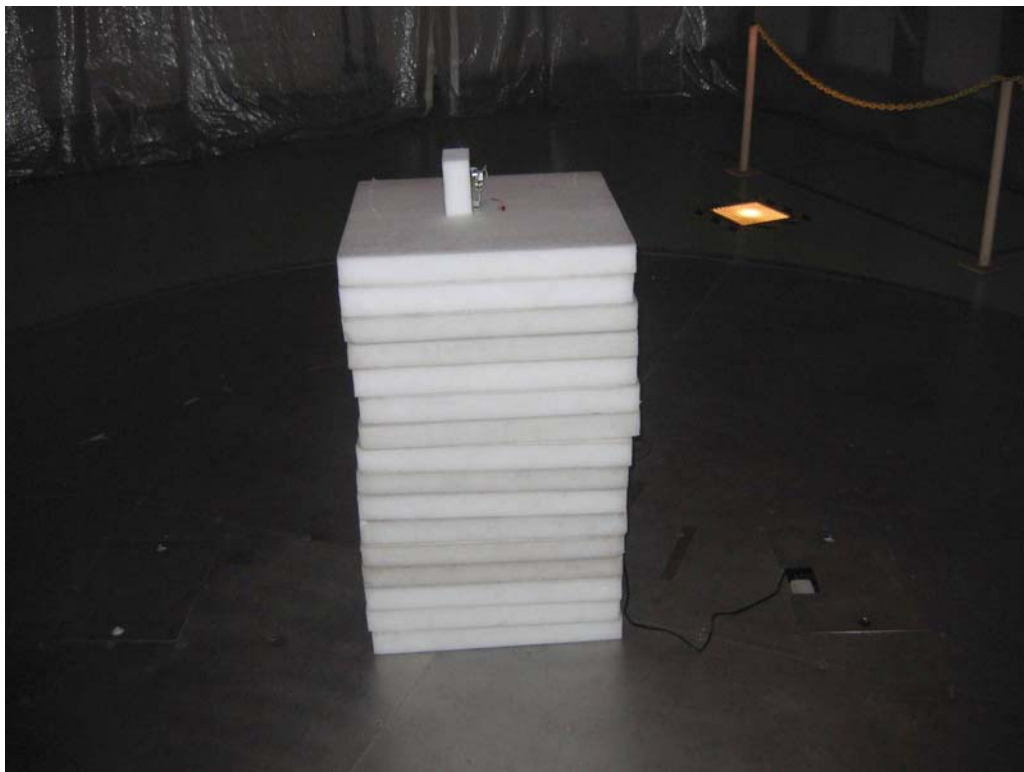
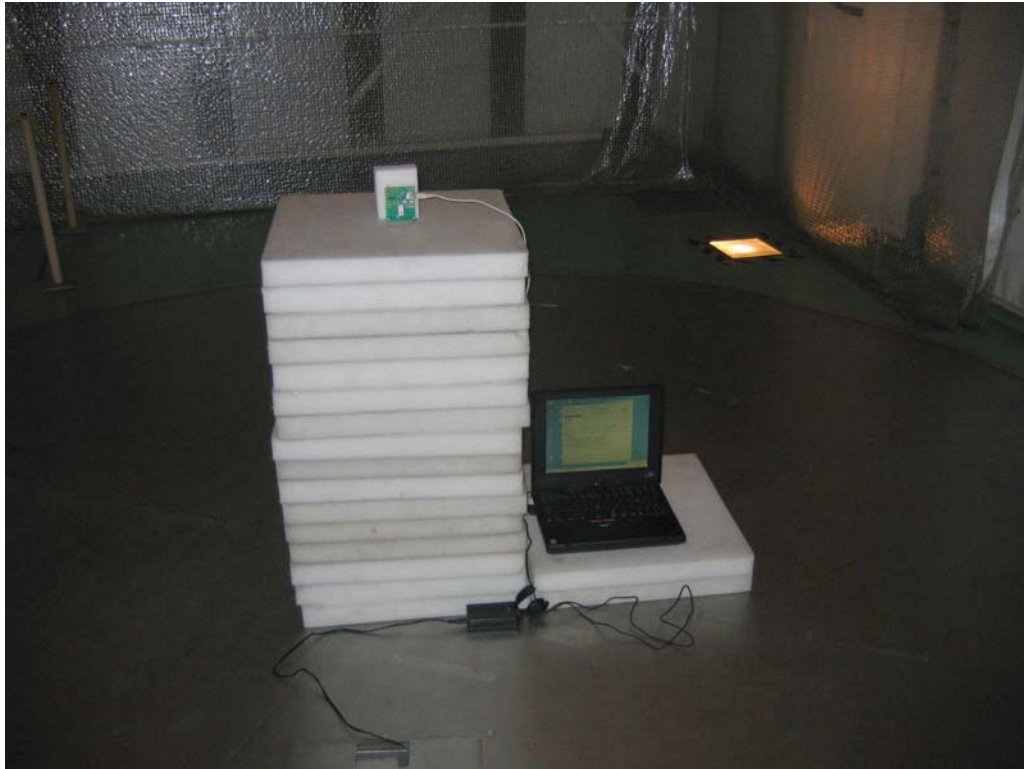
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Radiated emission



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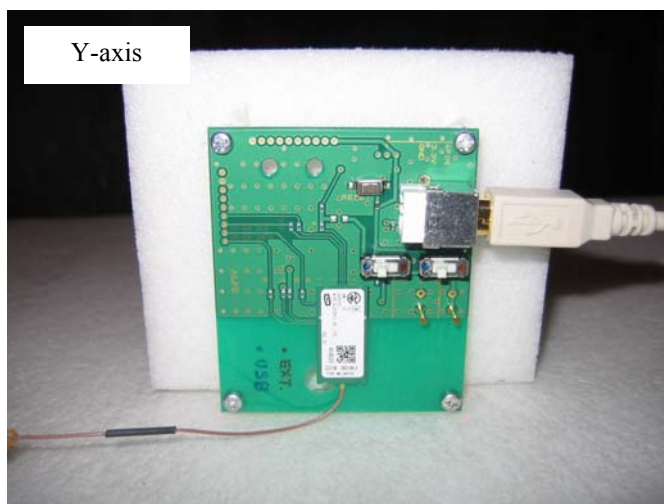
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Pre check of worse-case position (Module)

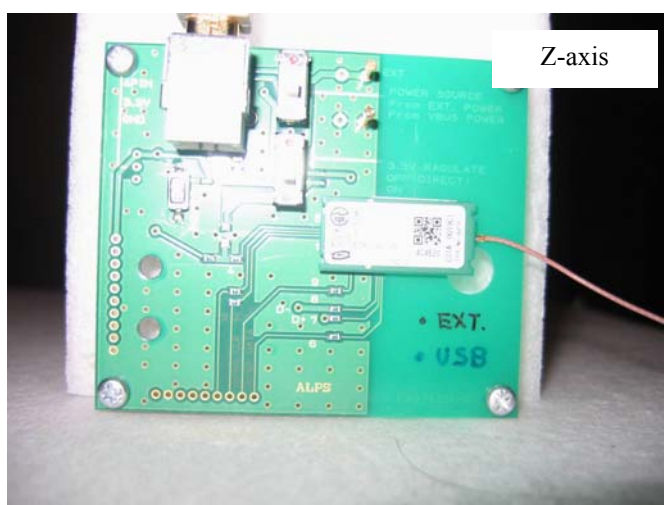
X-axis



Y-axis

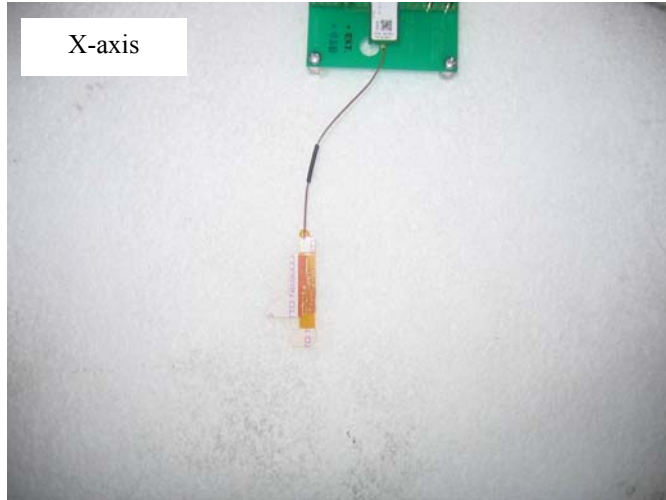


Z-axis

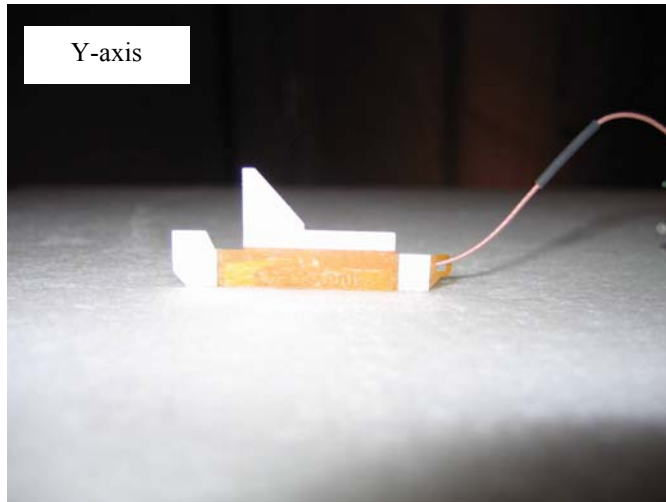


Pre check of worse-case position (Antenna)

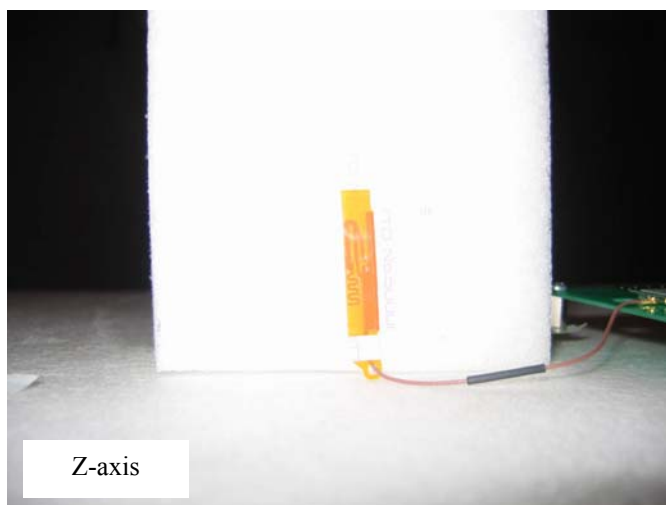
X-axis



Y-axis



Z-axis



DATA OF CONDUCTION TEST

UL Apex Co.,Ltd.
YAMAKITA No.1 SHIELD ROOM
Report No. : 27GE0097-YK - A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz
Remarks : Ant:1981566-1
Date : 3/5/2007
Phase : Single Phase
Temperature : 22 °C
Humidity : 50 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)
Engineer : Fumiaki Matsuo

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μV]	AV [dB μV]	QP [dB μV]	AV [dB μV]				QP [dB]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]
1.	0.1596	51.0	44.9	51.1	47.4	0.1	0.1	0.0	51.3	47.6	65.5	55.5	14.2	7.9
2.	0.2115	44.4	31.3	44.5	31.9	0.1	0.1	0.0	44.7	32.1	63.1	53.1	18.4	21.0
3.	0.3155	36.8	-	36.5	-	0.1	0.1	0.0	37.0	-	59.8	49.8	22.8	-
4.	1.1269	28.8	-	28.0	-	0.1	0.3	0.0	29.2	-	56.0	46.0	26.8	-
5.	2.5260	30.8	-	29.6	-	0.1	0.4	0.0	31.3	-	56.0	46.0	24.7	-
6.	15.8861	28.5	-	28.7	-	0.4	1.5	0.0	30.6	-	60.0	50.0	29.4	-

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

■ LISN: KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-14/15/16/18
■ PULSE LIMITER: KPL-01 ■ EMI RECEIVER: KTR-02 (ESCS30)

DATA OF CONDUCTION TEST

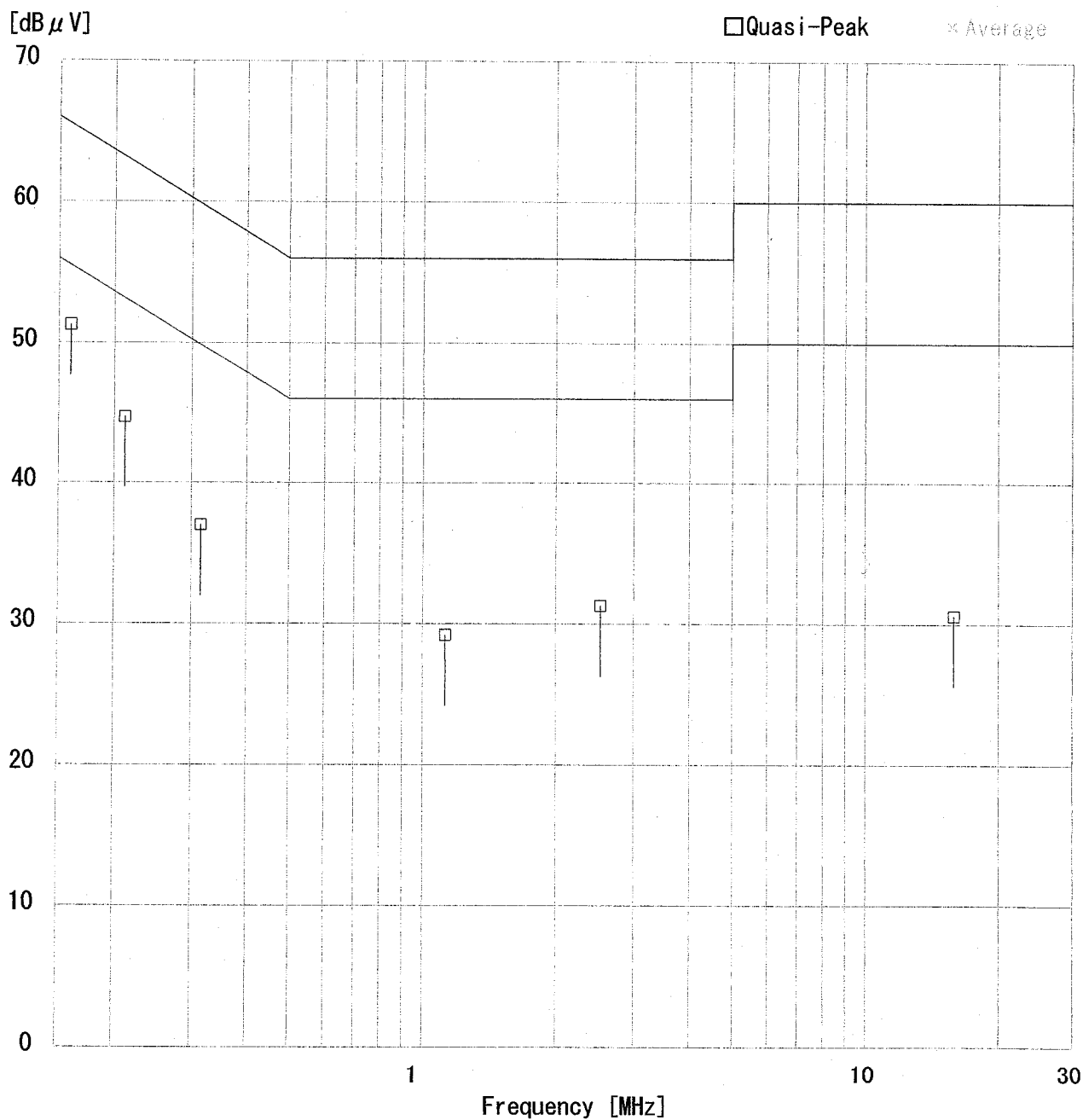
UL Apex Co.,Ltd.

YAMAKITA No.1 SHIELD ROOM

Report No. : 27GE0097-YK - A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz
Remarks : Ant:1981566-1
Date : 3/5/2007
Phase : Single Phase
Temperature : 22 °C
Humidity : 50 %
Regulation : FCC Part15C § 15.207. (CISPR Pub.22)

Engineer : Fumiaki Matsuo



Page:

DATA OF CONDUCTION TEST CHART

UL Apex Co.,Ltd.

YAMAKITA No.1 SHIELD ROOM

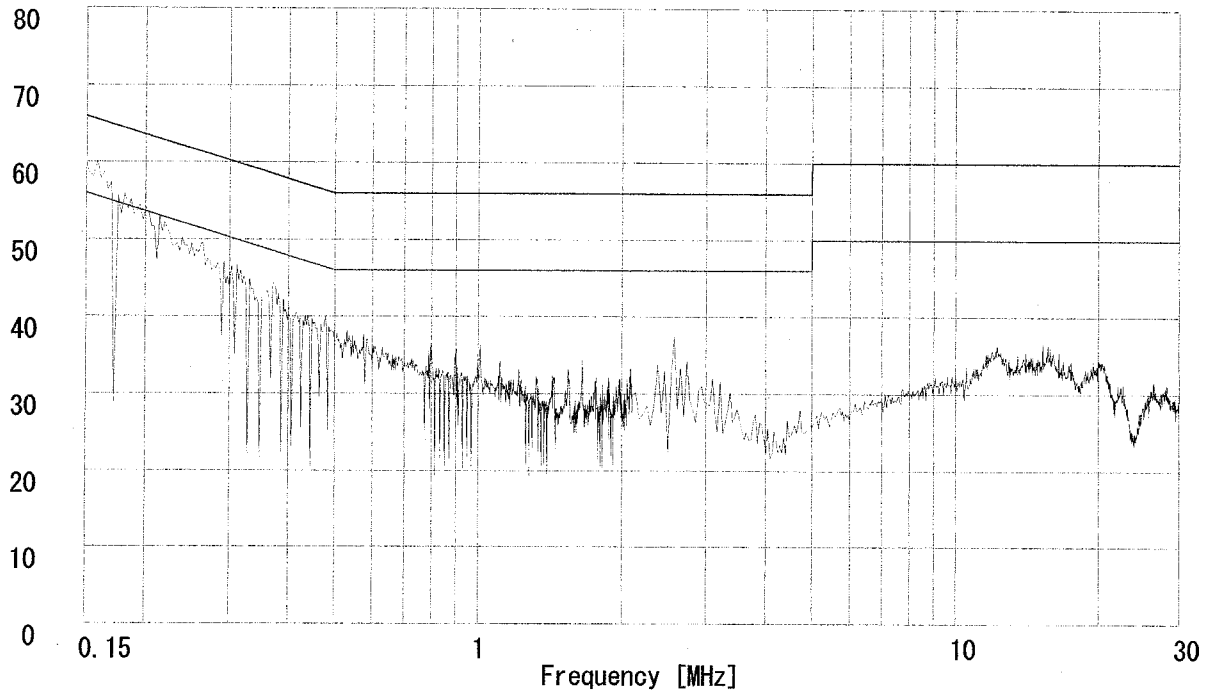
Report No. : 27GE0097-YK-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz
Remarks : Ant:1981566-1
Date : 3/5/2007
Phase : Single Phase
Temperature : 22 °C
Humidity : 50 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Fumiaki Matsuo

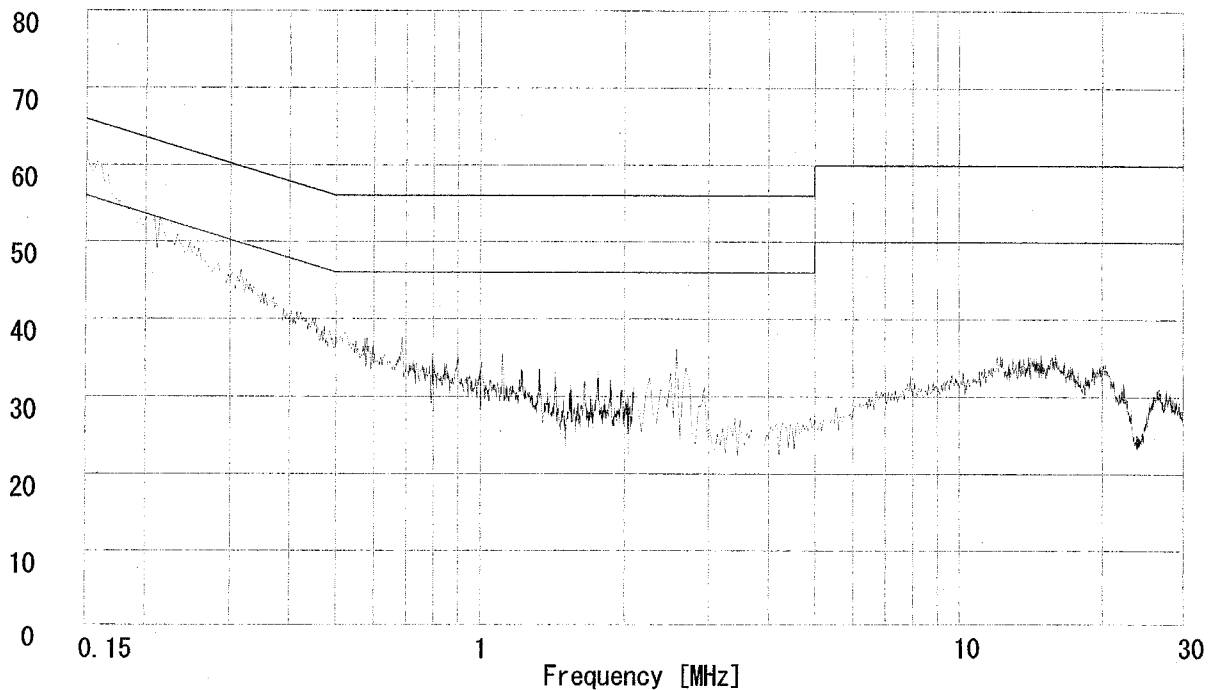
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



Page:

DATA OF CONDUCTION TEST CHART

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YAMAKITA No.1 SHIELD ROOM

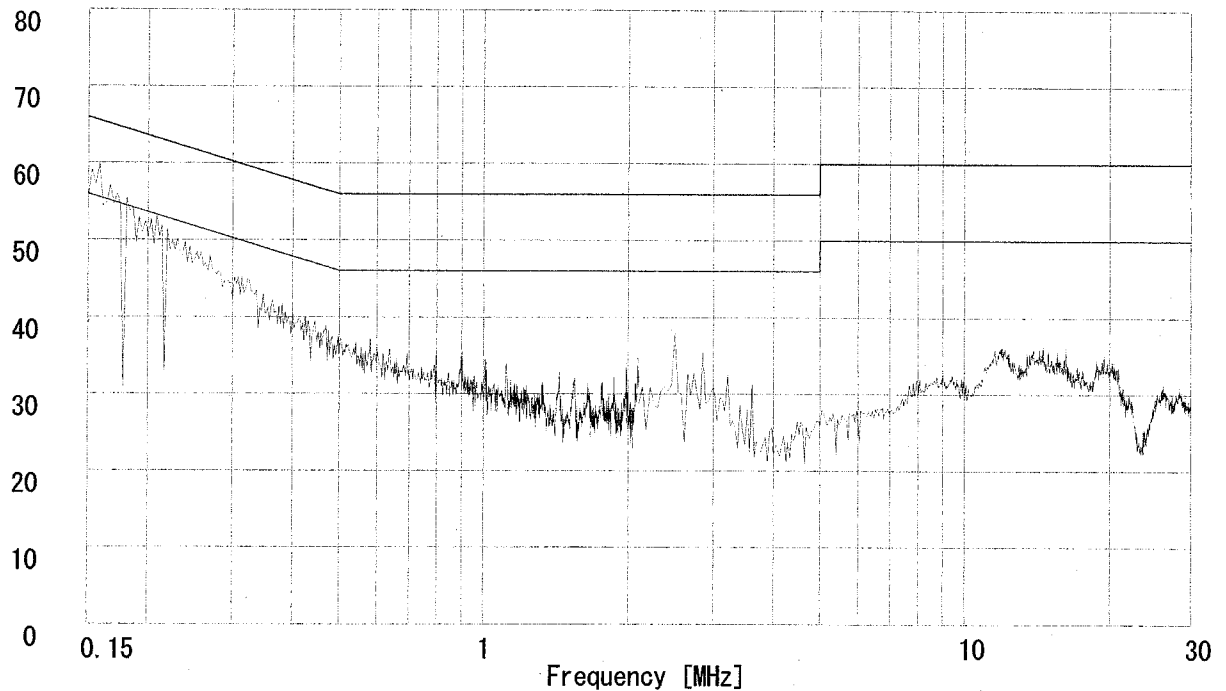
Report No. : 27GE0097-YK-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2441MHz
Remarks : Ant:1981566-1
Date : 3/5/2007
Phase : Single Phase
Temperature : 22 °C
Humidity : 50 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Fumiaki Matsuo

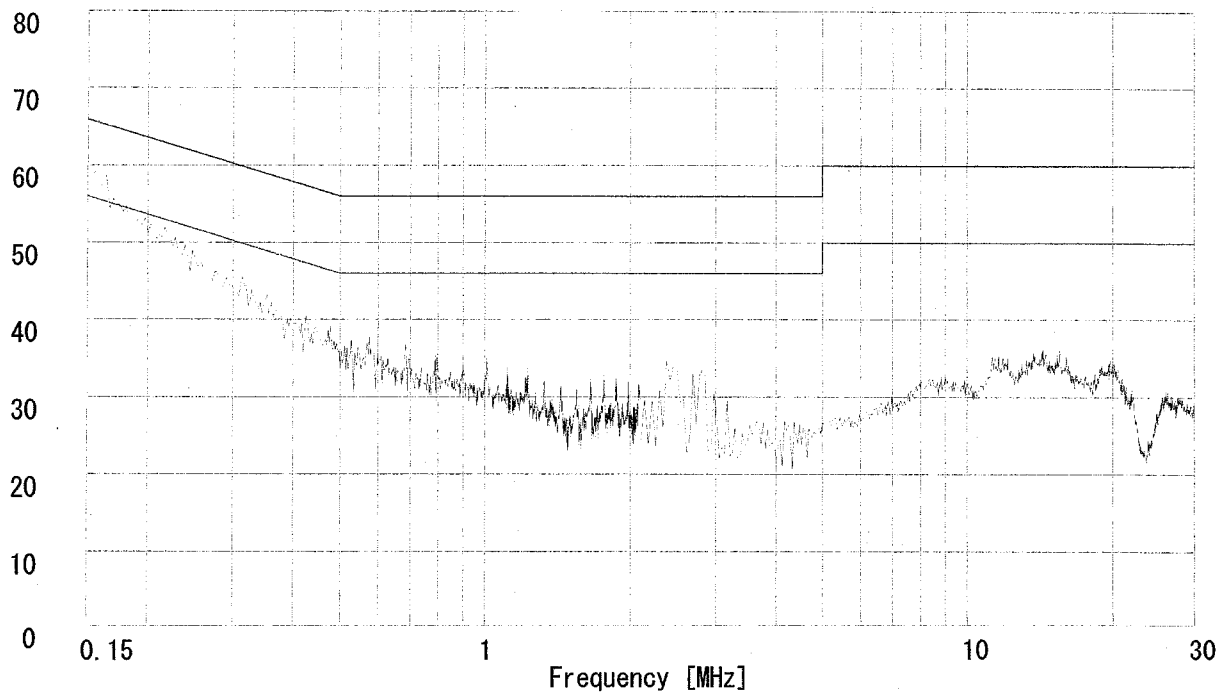
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



Page:

DATA OF CONDUCTION TEST CHART

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YAMAKITA No.1 SHIELD ROOM

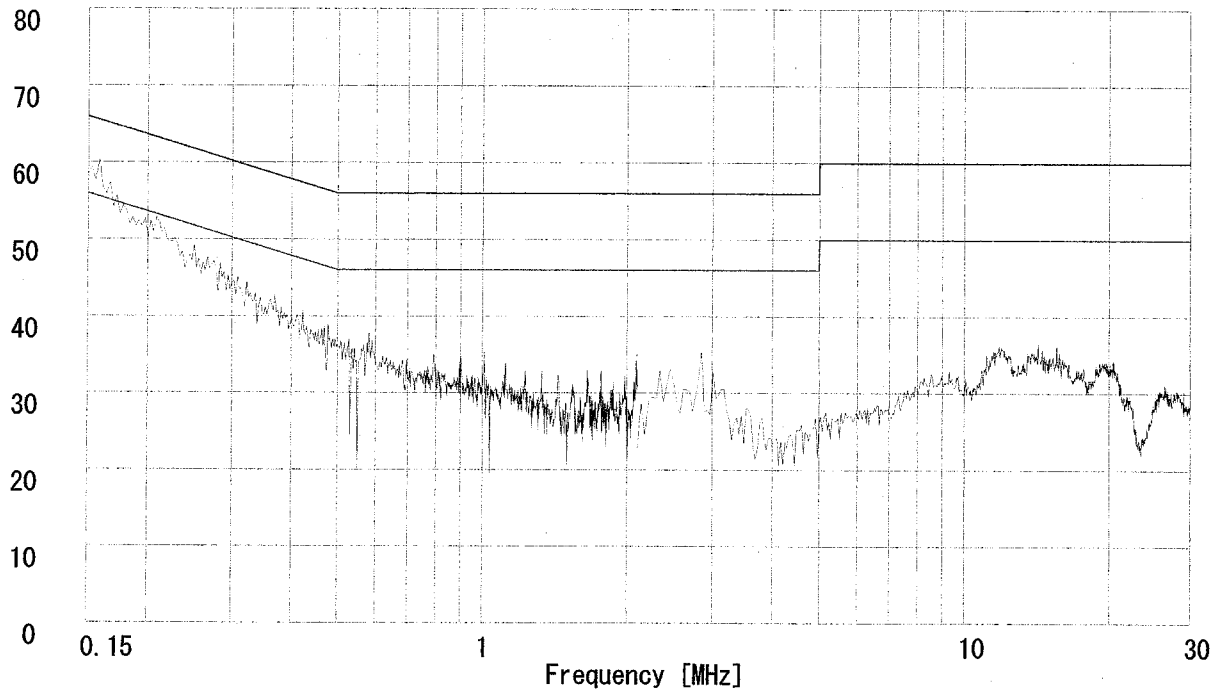
Report No. : 27GE0097-YK - A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2480MHz
Remarks : Ant:1981566-1
Date : 3/5/2007
Phase : Single Phase
Temperature : 22 °C
Humidity : 50 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Fumiaki Matsuo

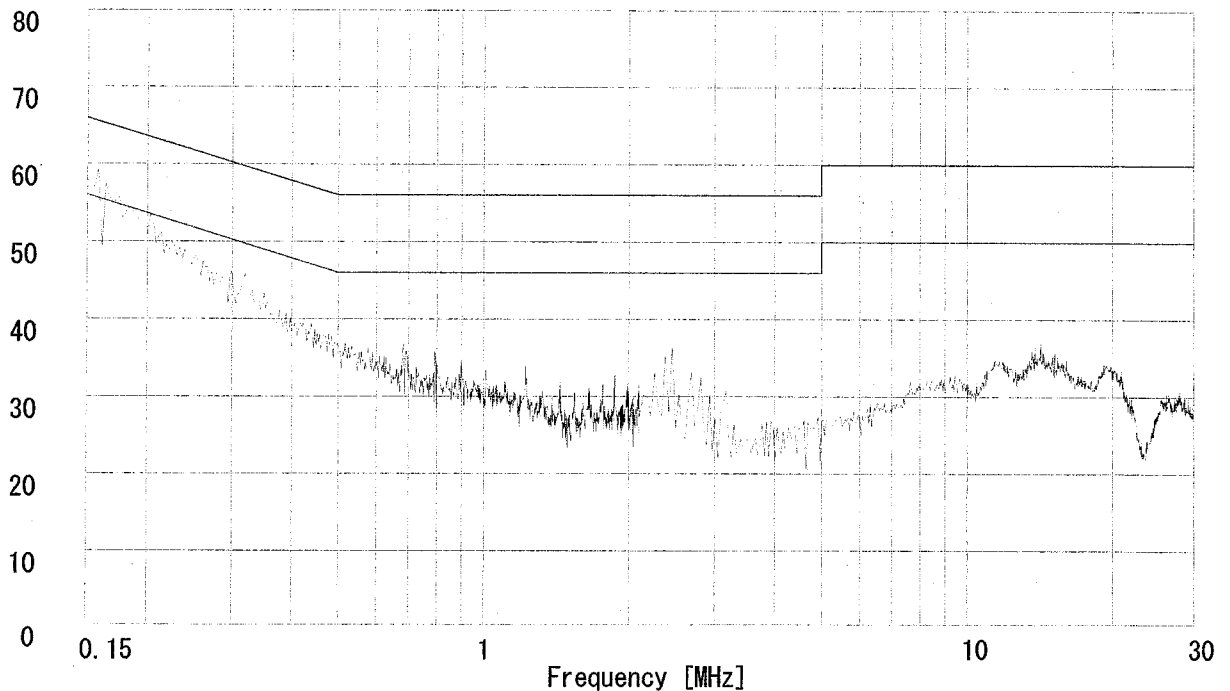
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



Page:

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK- A

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 4C4E20
 Power : DC3.3V
 Mode : Tx:2402MHz
 Remarks : ANT:1981566-1
 Date : 3/5/2007
 Test Distance : 3 m
 Temperature : 22 °C
 Humidity : 50 %
 Regulation : FCC Part15C § 15.209

Engineer : Fumiaki Matsuo

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.	39.50	BB	24.1	34.0	13.3	28.4	1.6	6.0	16.6	26.5	40.0	23.4	13.5
2.	108.01	BB	25.0	36.0	10.9	28.2	2.7	6.1	16.5	27.5	43.5	27.0	16.0
3.	199.96	BB	30.0	37.5	16.6	27.9	3.8	6.0	28.5	36.0	43.5	15.0	7.5
4.	466.55	BB	34.5	30.7	18.0	29.0	6.2	6.0	35.7	31.9	46.0	10.3	14.1

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)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK - A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V
Mode : Tx:2402MHz
Remarks : ANT:1981566-1, PK(RBW:1MHz, VBW:1MHz)
Date : 3/5/2007
Test Distance : 3 m
Temperature : 22 °C Engineer : Fumiaki Matsuo
Humidity : 50 %
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 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.	2390.00	BB	45.0	44.3	29.8	36.8	4.0	9.9	51.9	51.2	74.0	22.1	22.8
2.	4804.00	BB	55.0	54.0	33.8	37.1	5.8	0.5	58.0	57.0	74.0	16.0	17.0
3.	7206.00	BB	44.6	44.3	37.5	36.9	6.6	0.5	52.3	52.0	74.0	21.7	22.0
4.	9608.00	BB	48.0	47.0	38.9	37.0	7.6	1.0	58.5	57.5	74.0	15.5	16.5

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) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK-A

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 4C4E20
 Power : DC3.3V
 Mode : Tx:2402MHz
 Remarks : ANT:1981566-1, AV (RBW:1MHz, VBW:10Hz)
 Date : 3/5/2007
 Test Distance : 3 m
 Temperature : 22 °C Engineer : Fumiaki Matsuo
 Humidity : 50 %
 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.	2390.00	BB	32.5	32.4	29.8	36.8	4.0	9.9	39.4	39.3	54.0	14.6	14.7
2.	4804.00	BB	42.2	42.0	33.8	37.1	5.8	0.5	45.2	45.0	54.0	8.8	9.0
3.	7206.00	BB	32.0	32.0	37.5	36.9	6.6	0.5	39.7	39.7	54.0	14.3	14.3
4.	9608.00	BB	35.2	35.0	38.9	37.0	7.6	1.0	45.7	45.5	54.0	8.3	8.5

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) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK- A

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 4C4E20
 Power : DC3.3V
 Mode : Tx:2441MHz
 Remarks : ANT:1981566-1
 Date : 3/5/2007
 Test Distance : 3 m
 Temperature : 22 °C
 Humidity : 50 %
 Regulation : FCC Part15C § 15.209

Engineer : Fumiaki Matsuo

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.	39.50	BB	24.7	34.2	13.3	28.4	1.6	6.0	17.2	26.7	40.0	22.8	13.3
2.	108.01	BB	24.6	36.0	10.9	28.2	2.7	6.1	16.1	27.5	43.5	27.4	16.0
3.	199.96	BB	29.8	37.4	16.6	27.9	3.8	6.0	28.3	35.9	43.5	15.2	7.6
4.	466.55	BB	34.5	31.0	18.0	29.0	6.2	6.0	35.7	32.2	46.0	10.3	13.8

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)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK- **A**

Applicant	: Alps Electric Co.,Ltd.
Kind of Equipment	: Bluetooth Transceiver Module
Model No.	: UGPZ6
Serial No.	: 4C4E20
Power	: DC3.3V
Mode	: Tx:2441MHz
Remarks	: ANT:1981556-1, PK (RBW:1MHz, VBW:1MHz)
Date	: 3/5/2007
Test Distance	: 3 m
Temperature	: 22 °C
Humidity	: 50 %
Regulation	: FCC Part15C § 15.209 (PK Detection)

Engineer : Fumiaki Matsuo

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					HOR [dB μV/m]	VER		HOR [dB]	VER
1.	4882.00	BB	52.0	49.0	34.0	37.2	5.8	0.5	55.1	52.1	74.0	18.9	21.9
2.	7323.00	BB	44.0	44.2	37.6	37.0	6.7	0.5	51.8	52.0	74.0	22.2	22.0
3.	9764.00	BB	47.2	47.0	38.8	37.0	7.6	0.9	57.5	57.3	74.0	16.5	16.7

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) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK - A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V
Mode : Tx:2441MHz
Remarks : ANT:1981566-1, AV (RBW:1MHz, VBW:10Hz)
Date : 3/5/2007
Test Distance : 3 m
Temperature : 22 °C Engineer : Fumiaki Matsuo
Humidity : 50 %
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.	4882.00	BB	40.0	38.0	34.0	37.2	5.8	0.5	43.1	41.1	54.0	10.9	12.9
2.	7323.00	BB	32.1	32.1	37.6	37.0	6.7	0.5	39.9	39.9	54.0	14.1	14.1
3.	9764.00	BB	35.7	35.6	38.8	37.0	7.6	0.9	46.0	45.9	54.0	8.0	8.1

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) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK A

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 4C4E20
 Power : DC3.3V
 Mode : Tx:2480MHz
 Remarks : ANT:1981566-1
 Date : 3/5/2007
 Test Distance : 3 m
 Temperature : 22 °C
 Humidity : 50 %
 Regulation : FCC Part15C § 15.209

Engineer : Fumiaki Matsuo

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.	39.50	BB	24.5	34.4	13.3	28.4	1.6	6.0	17.0	26.9	40.0	23.0	13.1
2.	108.01	BB	25.2	35.8	10.9	28.2	2.7	6.1	16.7	27.3	43.5	26.8	16.2
3.	199.96	BB	30.2	37.3	16.6	27.9	3.8	6.0	28.7	35.8	43.5	14.8	7.7
4.	466.55	BB	34.0	30.5	18.0	29.0	6.2	6.0	35.2	31.7	46.0	10.8	14.3

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)

Page:

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK - A

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6
 Serial No. : 4C4E20
 Power : DC3.3V
 Mode : Tx:2480MHz
 Remarks : ANT:1981566-1, PK(RBW:1MHz, VBW:1MHz)
 Date : 3/5/2007
 Test Distance : 3 m
 Temperature : 25 °C
 Humidity : 37 %
 Regulation : FCC Part15C § 15.209(PK Detection)

Engineer : Fumiaki Matsuo

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	52.1	50.8	29.7	36.8	4.0	9.9	58.9	57.6	74.0	15.1	16.4
2.	4960.00	BB	51.0	48.2	34.2	37.3	5.8	0.4	54.1	51.3	74.0	19.9	22.7
3.	7440.00	BB	44.0	44.2	37.8	37.0	6.7	0.5	52.0	52.2	74.0	22.0	21.8
4.	9920.00	BB	48.3	48.3	38.7	36.9	7.6	0.8	58.5	58.5	74.0	15.5	15.5

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) ■ SPECTRUMANALYZER: R3271A (KSA-04)

DATA OF RADIATION TEST

UL Apex Co.,Ltd.

YAMAKITA No.1 OPEN TEST SITE

Report No. : 27GE0097-YK - A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6
Serial No. : 4C4E20
Power : DC3.3V
Mode : Tx:2480MHz
Remarks : ANT:1981566-1, AV (RBW:1MHz, VBW:10Hz)
Date : 3/5/2007
Test Distance : 3 m
Temperature : 22 °C Engineer : Fumiaki Matsuo
Humidity : 50 %
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.	2483.50	BB	41.0	40.2	29.7	36.8	4.0	9.9	47.8	47.0	54.0	6.2	7.0
2.	4960.00	BB	39.8	37.1	34.2	37.3	5.8	0.4	42.9	40.2	54.0	11.1	13.8
3.	7440.00	BB	32.1	32.2	37.8	37.0	6.7	0.5	40.1	40.2	54.0	13.9	13.8
4.	9920.00	BB	36.5	36.3	38.7	36.9	7.6	0.8	46.7	46.5	54.0	7.3	7.5

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) ■ SPECTRUMANALYZER: R3271A (KSA-04)

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
YA-CE	Conducted emission(software)	UL-Apex	CE(Ver.1.6)	CE	-
YA-RE	Radiated emission(software)	UL-Apex	RE(Ver.1.5)	RE	-
KAF-01	Pre Amplifier	Hewlett Packard	8447D	RE	2006/05/10 * 12
KAT6-02	Attenuator	INMET	18N-6dB	RE	2006/03/24 * 12
KBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2006/07/22 * 12
KCC-10/11/12 /13/18/KRM-01	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	8D-2W/12D-SFA/S04272B/S04272B/-	RE	2006/05/16 * 12
KCC-14/15/16 /18/KPL-01/KRM-01	Coaxial Cable/Pulse Limiter/RF Relay Matrix	Fujikura/Suhner/PMM/TSJ	5D-2W/8D-2W/S04272B/S04272B/PL01/-	CE	2006/05/16 * 12
KLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2007/01/06 * 12
KLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2006/09/25 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	CE	2006/09/05 * 12
KTM-01	Terminator	TME	CT-01BP	CE	2006/03/24 * 12
KTR-02	Test Receiver	Rohde & Schwarz	ESCS30	CE	2006/11/25 * 12
KOS-03	Humidity Indicator	SATO	PC-5000TRH	RE	2006/07/10 * 24
KOS-04	Humidity Indicator	SATO	PC-5000TRH	CE	2006/07/14 * 24
KJM-03	Measure	TAJIMA	GL19-55	CE/RE	-
KAF-02	Pre Amplifier	Hewlett Packard	8449B	RE	2006/04/24 * 12
KAT10-S1	Attenuator	Agilent	8449D 010	RE	2006/04/11 * 12
KCC-D3/D7	Coaxial Cable	Rosenberger/Advantest	2201/JUN-08-01-061	RE	2006/04/11 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2006/04/11 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2006/08/17 * 12
KHA-03	Horn Antenna	EMCO	3160-09	RE	2006/04/10 * 12

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

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

Test Item :

CE: Conducted Emission

RE: Out of Band Emission (Radiated)