



RADIO TEST REPORT


Test Report No. : 28IE0228-YK-01-A


Applicant : Alps Electric Co., Ltd.
Type of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
FCC ID : CWTUGPZ6-C3
Test regulation : FCC Part15 Subpart C: 2008
Section 15.207 Conducted emission
Section 15.209, Section 15.247
Out of Band emissions (Radiated)
Test result : Complied

1. This test report shall not be reproduced except in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test: May 16 and 19, 2008

Tested by: 
Go Ishiwata

& 
Tatsuya Arai

Approved by: 
Toyokazu Imamura
Engineer of Yamakita EMC Lab.

UL Japan, Inc.

YAMAKITA EMC LAB.

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MF060b (18.06.07)

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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-C3
Serial No. : 0002c752d0e6
Rating : DC 3.3V
Country of Manufacture : Japan
Receipt Date of Sample : May 15, 2008
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-C3 (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 : HFS37-NE01 (PIFA)
Antenna gain with cable loss : -3.0dBi
Antenna connector type : U. FL (Hirose)
ITU code : F1D, G1D
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: 2008, final revised on May 19, 2008
 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

*The revision on May 19, 2008 does not influence the test specification applied to the EUT.

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	10.0dB (0.1585MHz, AV, N, Tx 2402MHz, 3DH5)	Complied
Carrier Frequency Separation	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)	Conducted	Excluded *1	N/A	N/A
20dB Bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)	Conducted	Excluded *1		N/A
Number of Hopping Frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)(iii)	Conducted	Excluded *1		N/A
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)(iii)	Conducted	Excluded *1		N/A
Maximum Peak Output Power	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (b)(1)	Conducted	Excluded *1		N/A
Band edge compliance	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (d)	Radiated	N/A	See data	Complied
Spurious Emission	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.209 Section15.247 (d)	Conducted / Radiated	N/A	3.6dB (4804.00MHz, AV, Horizontal, Tx 2402MHz DH5)	Complied

Note: UL Japan's EMI Work Procedures No.QPM05 and QPM15.

*1) Results for these test items are described in the test reports, 28DE0007-YK-01-A. The Module has been certificated with other type antenna.

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

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3.3 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

	No.1 open site (±)	No.2 open site (±)	No.1 anechoic chamber (±)
Conducted emission			
150kHz-30MHz	2.8 dB	2.8 dB	2.8 dB
Radiated emission (3m)			
30-300MHz	4.5 dB	4.4 dB	4.5 dB
300-1000MHz	4.3 dB	4.3 dB	4.3 dB
1GHz<	5.7 dB	5.7 dB	5.7 dB

Conducted Emission Test

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

Radiated Emission Test

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

3.4 Test Location

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 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. : 2973B-1

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on February 27, 2008 (Registration No.: 466226).
 IC Registration No. : 2973B-3

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. : 2973B-2

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 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		

Open test site	Maximum measurement distance
No.1 open test site	30m
No.2 open test site	10m

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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 item	Operating mode	Tested frequency
Conducted emission	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping OFF	2402MHz, 2441MHz, 2480MHz
Spurious emission & Band edge compliance (Radiated)	Transmitting (DH5/3DH5), Payload: PRBS9 -Hopping OFF	2402MHz, 2441MHz, 2480MHz

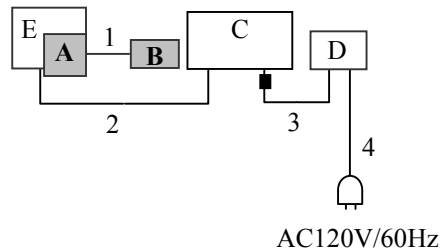
*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload.

*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 due to the overlap of the bandwidth.

4.2 Configuration of Tested System

■ : Ferrite core (Standard attachment)



* 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	Bluetooth Transceiver Module	UGPZ6-C3	0002c752d0e6	ALPS	CWTUGPZ6-C3 (EUT)
B	Antenna	HFS37-NE01	-	Hitachi cable	EUT
C	Notebook PC	Type 2662	FX-R2619	IBM	-
D	AC Adapter	83H6340	J14HC56211V	IBM	-
E	Testing Board	-	-	-	-(Test jig)

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Antenna cable	0.15	Shielded	Shielded	-
2	USB cable	0.9	Shielded	Shielded	-
3	DC cable	1.8	Unshielded	Unshielded	-
4	AC cable	1.0	Unshielded	Unshielded	-

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5 Conducted Emissions

5.1 Operating environment

The test was carried out in No.2 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. A drawing of the set up is shown in the photos of Appendix 1.

5.3 Test conditions

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

5.4 Test procedure

The host device, PC 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: 9kHz

5.5 Results

Summary of the test results : Pass

Date : May 16, 2008 Test engineer : Tatsuya Arai

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6 Out of Band Emissions (Radiated)

6.1 Operating environment

The test was carried out in No.1 anechoic chamber.

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 - 26.5GHz
 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.

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: 300Hz (See data)
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: X	Horizontal: X, Vertical: Z

6.5 Band edge

Band edge level at 2390MHz and 2483.5MHz is below the limits of FCC 15.209 and band edge level at 2400MHz is below the 20dBc. Refer to the data.

6.6 Results

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

Date : May 16 and 19, 2008

Test engineer : Go Ishiwata and Tatsuya Arai

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APPENDIX 1: Photographs of test setup

Page 10	:	Conducted emission
Page 11	:	Radiated emission
Page 12-13	:	Pre-check of the worst position

APPENDIX 2: Test Data

Page 14 - 23	:	Conducted emission
Page 24 - 41	:	Out of band emissions (Radiated)
Page 42	:	Duty cycle
Page 43 - 44	:	Band Edge (2400MHz)

APPENDIX 3: Test instruments

Page 45	:	Test instruments
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Conducted emission



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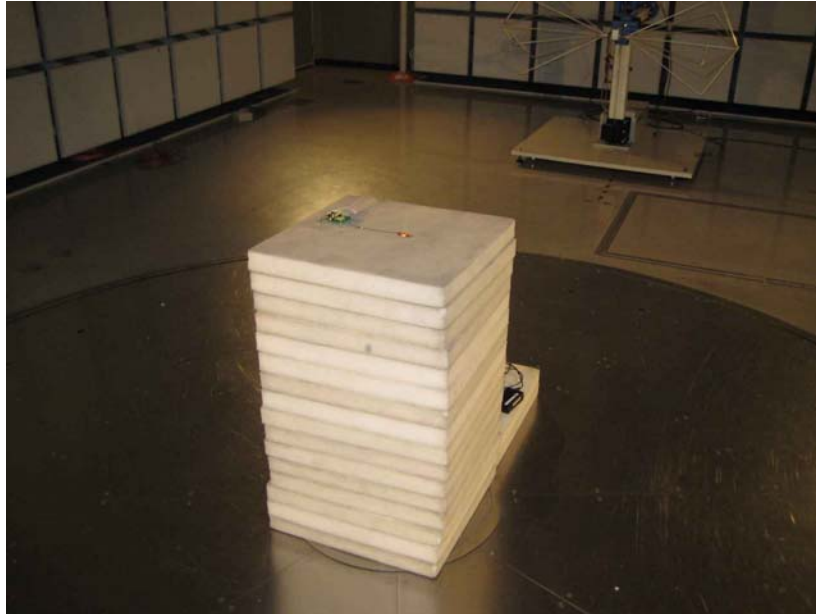
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Radiated emission



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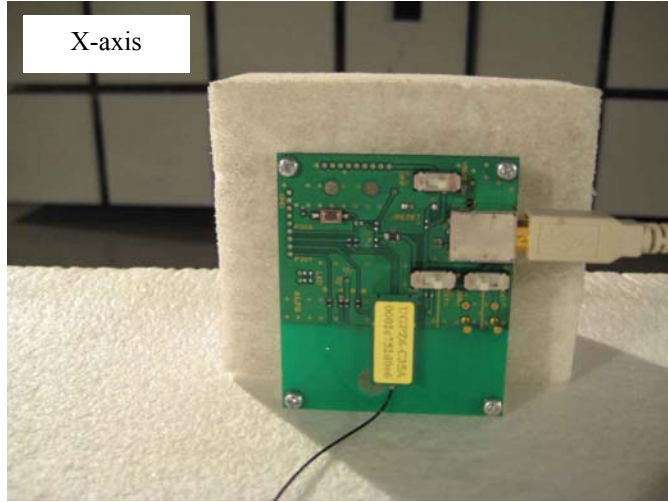
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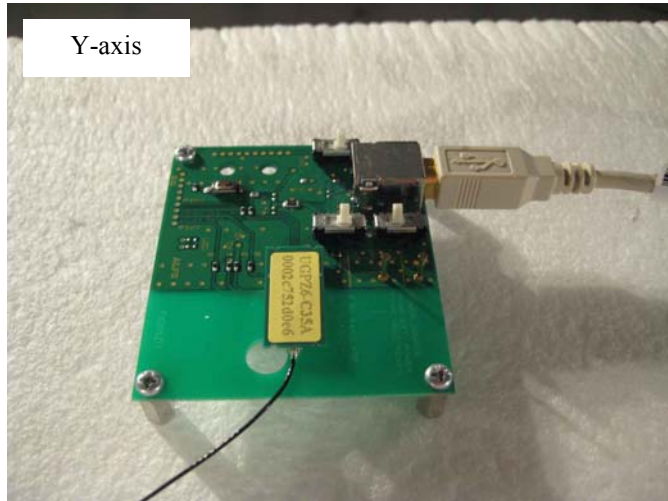
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Pre-check of the worst position (Module)

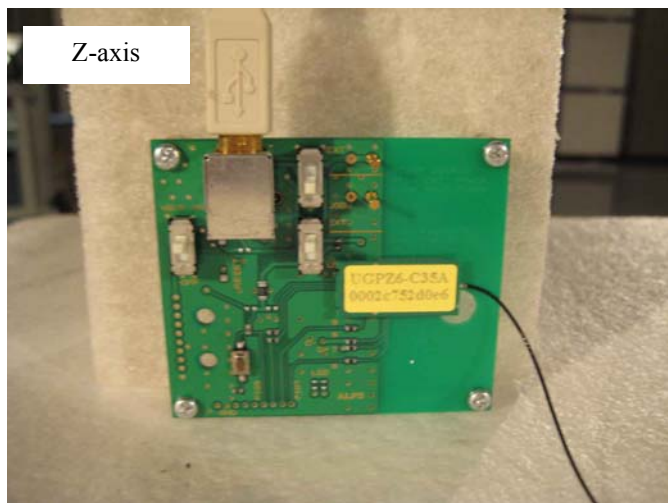
X-axis



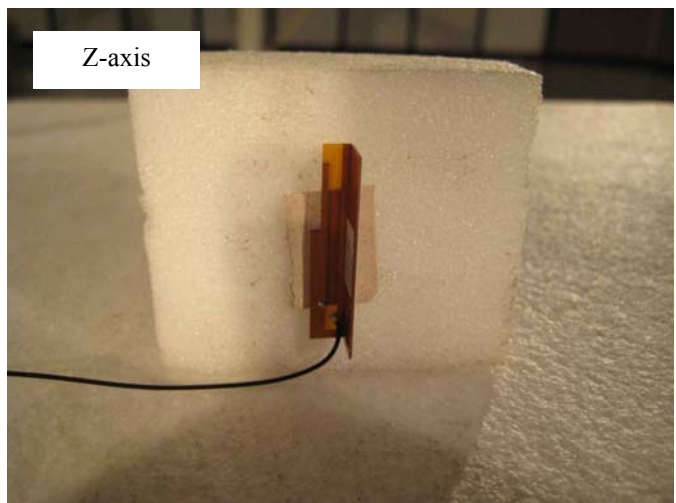
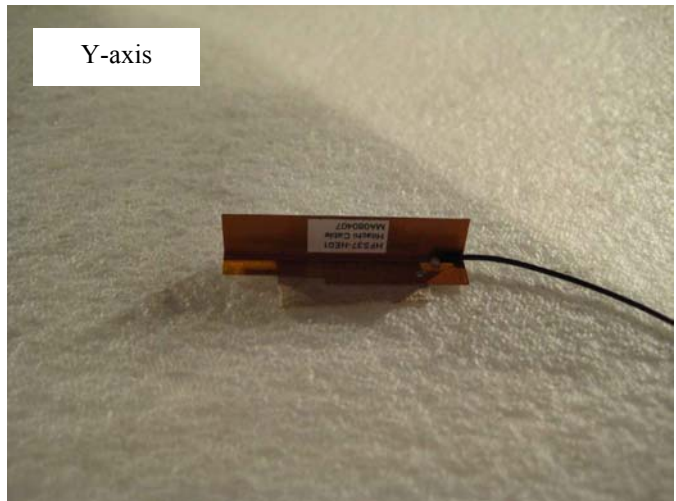
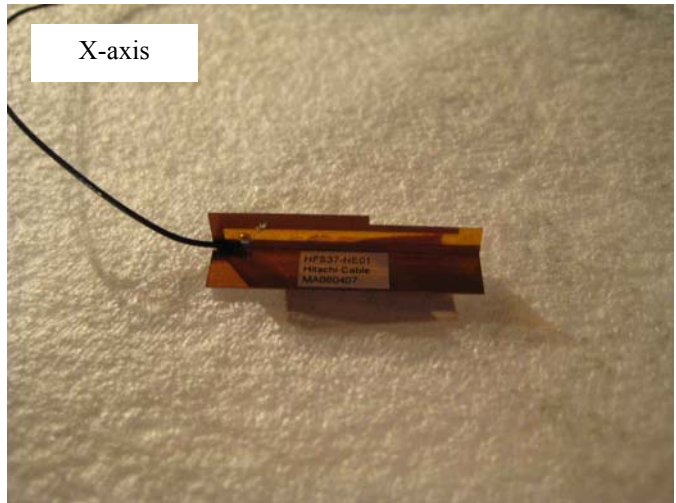
Y-axis



Z-axis



Pre-check of the worst position (Antenna)



DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz (DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C Engineer : Tatsuya Arai
Humidity : 44 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)

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.	0.1500	47.1	23.4	46.5	23.7	0.1	0.1	0.0	47.3	23.9	66.0	56.0	18.7	32.1
2.	0.1585	47.5	44.0	48.3	44.9	0.1	0.1	0.0	48.5	45.1	65.5	55.5	17.0	10.4
3.	0.2644	36.1	-	36.0	-	0.1	0.1	0.0	36.3	-	61.3	51.3	25.0	-
4.	0.4802	28.3	-	28.6	-	0.1	0.1	0.0	28.8	-	56.3	46.3	27.5	-
5.	0.6926	27.1	-	27.6	-	0.1	0.1	0.0	27.8	-	56.0	46.0	28.2	-
6.	1.1187	26.7	-	27.7	-	0.1	0.1	0.0	27.9	-	56.0	46.0	28.1	-
7.	2.5628	25.3	-	28.3	-	0.1	0.2	0.0	28.6	-	56.0	46.0	27.4	-
8.	14.2969	31.1	-	31.4	-	0.5	0.6	0.0	32.5	-	60.0	50.0	27.5	-

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

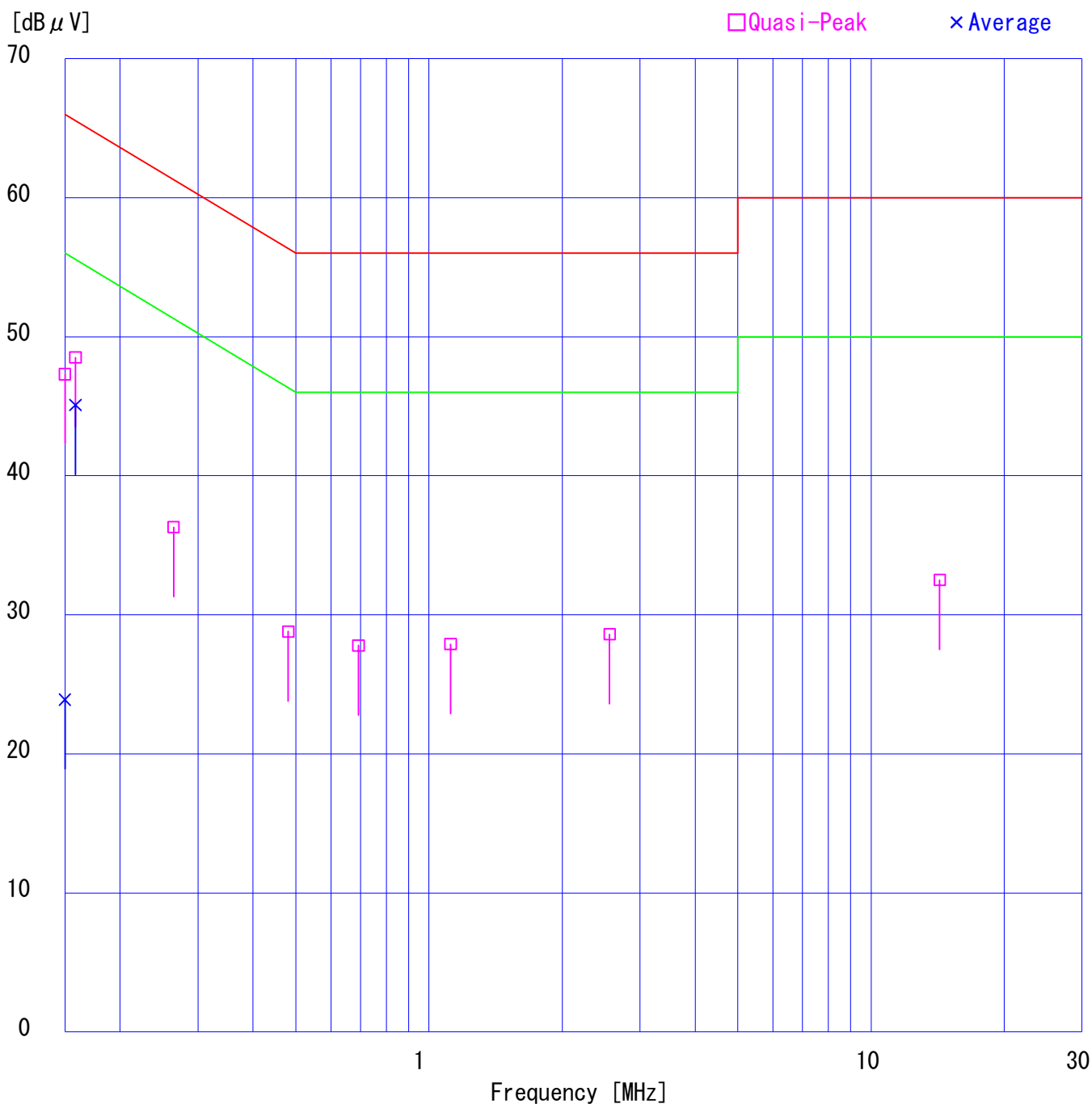
■ LISN: KLS-06 (NSLK8127) ■ COAXIAL CABLE: KCC-33/34
■ EMI RECEIVER: KTR-01 (ES140)

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Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation : FCC Part15C § 15. 207. (CISPR Pub. 22)

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

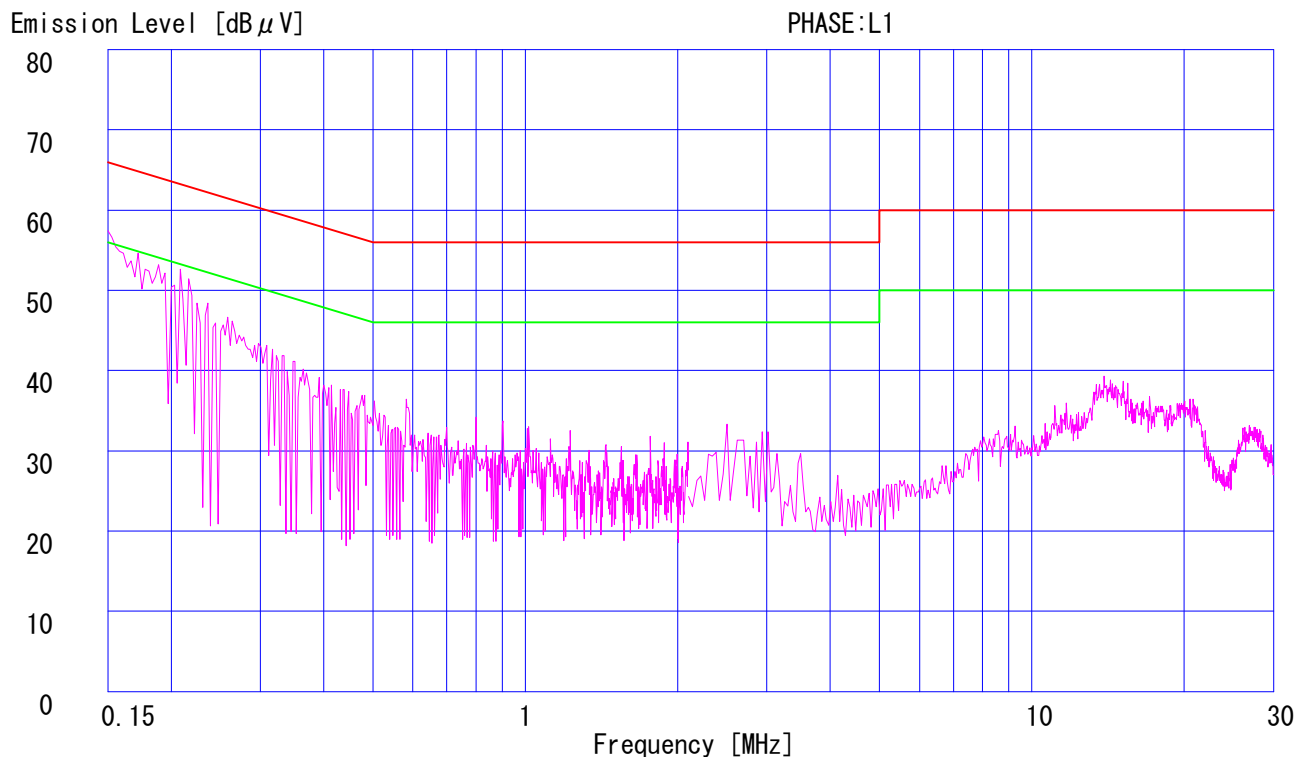
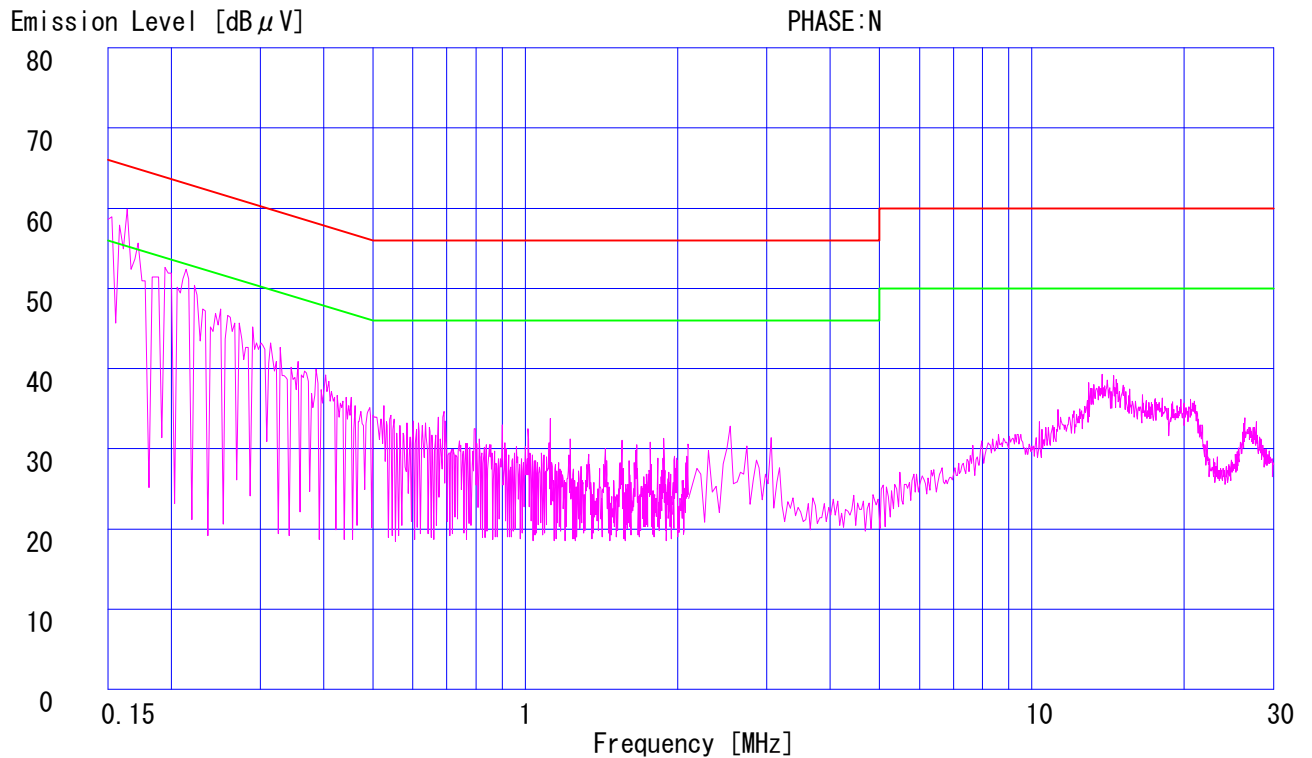
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Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

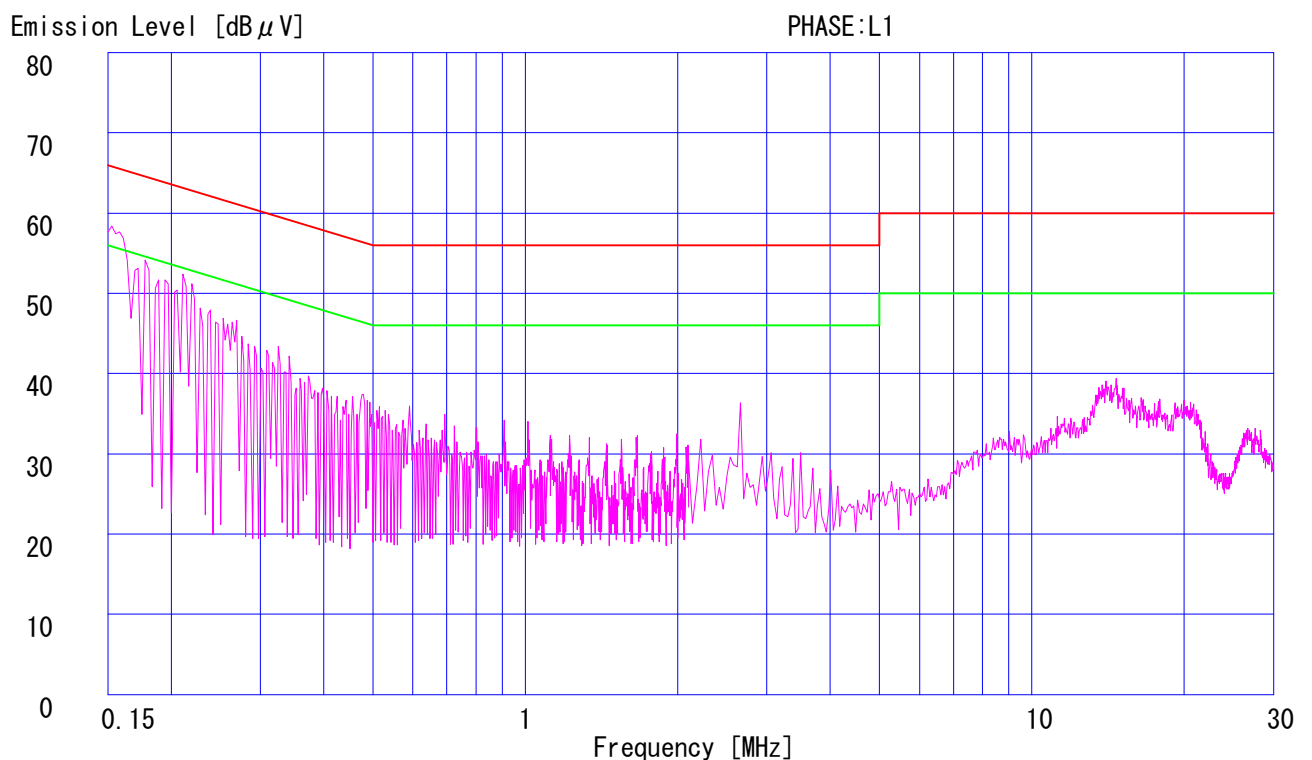
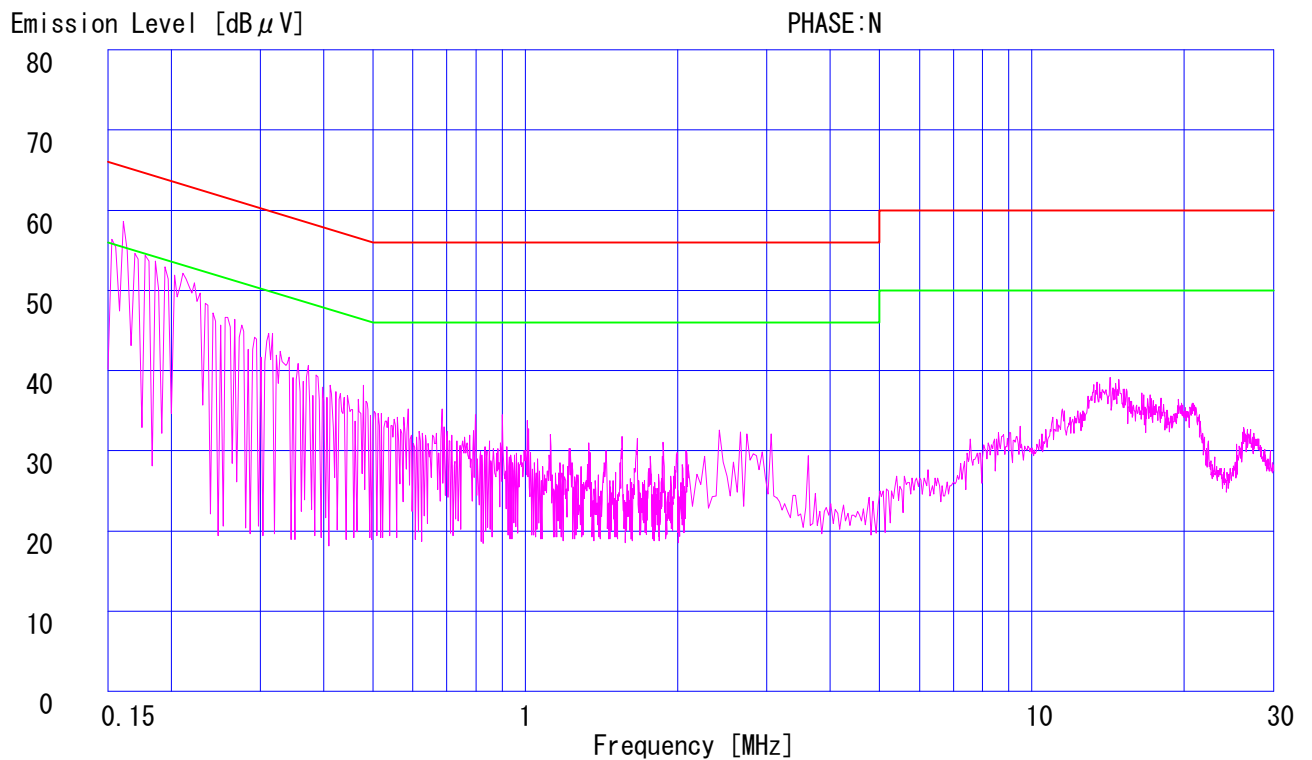
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Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2441MHz (DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



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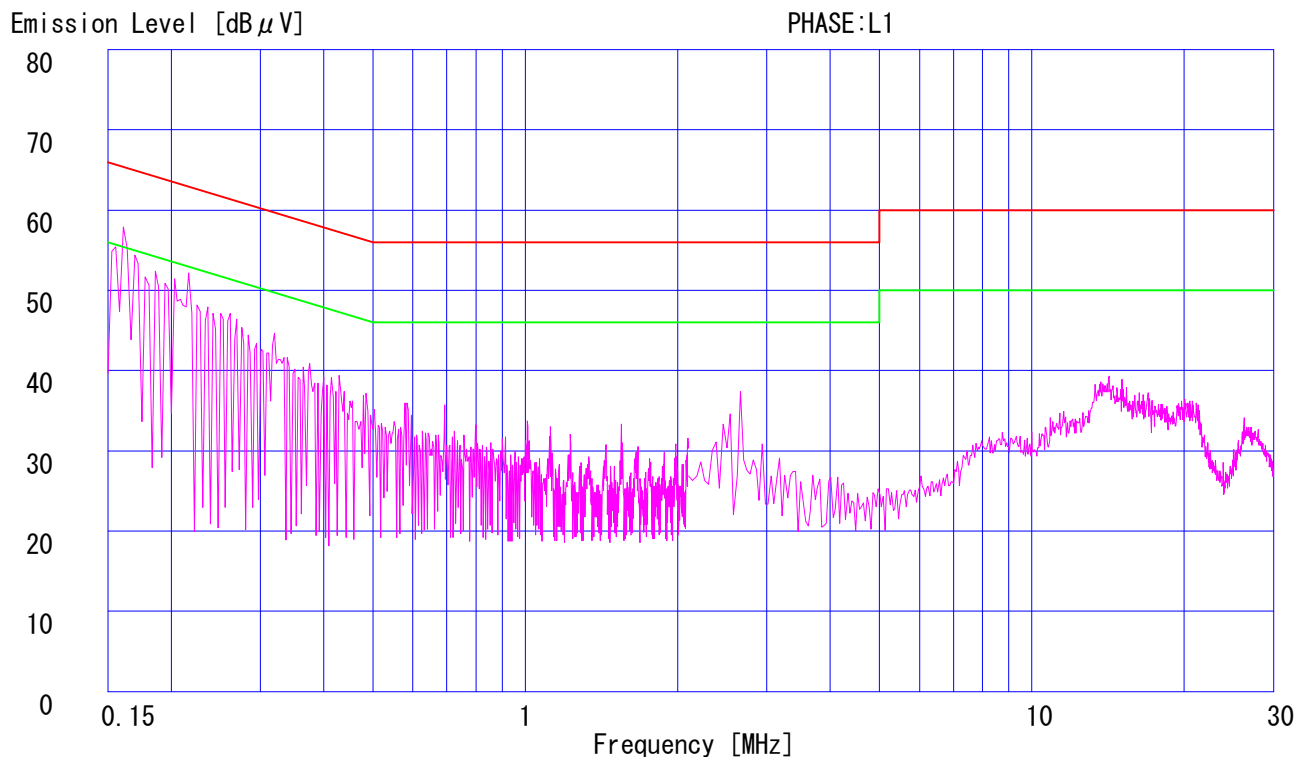
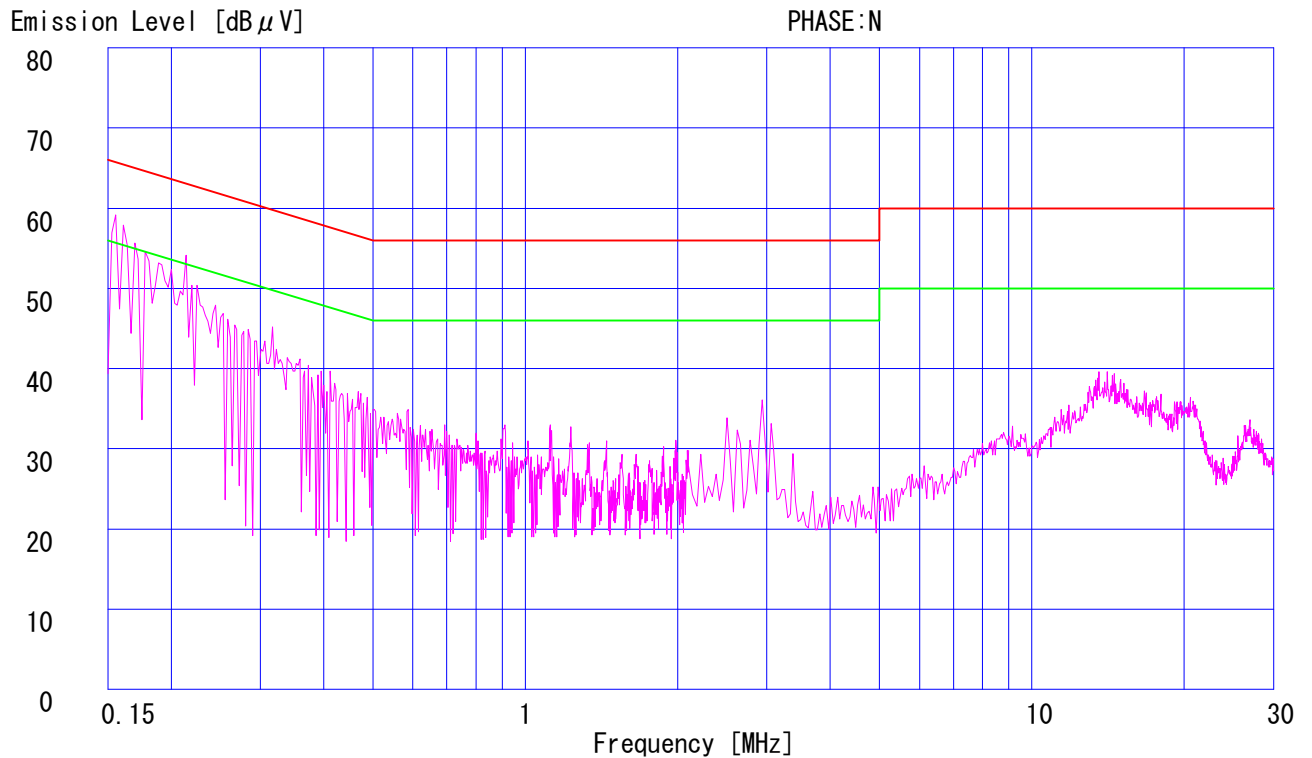
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Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2480MHz (DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Tatsuya Arai



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No.	FREQ. [MHz]	READING(N)		READING(L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μV]	AV	QP [dB μV]	AV				QP [dB]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]
1.	0.1500	48.5	24.4	46.7	23.4	0.1	0.1	0.0	48.7	24.6	66.0	56.0	17.3	31.4
2.	0.1585	48.7	45.3	48.0	44.7	0.1	0.1	0.0	48.9	45.5	65.5	55.5	16.6	10.0
3.	0.2651	37.2	-	35.7	-	0.1	0.1	0.0	37.4	-	61.3	51.3	23.9	-
4.	0.4807	28.9	-	28.1	-	0.1	0.1	0.0	29.1	-	56.3	46.3	27.2	-
5.	0.6923	27.8	-	28.0	-	0.1	0.1	0.0	28.2	-	56.0	46.0	27.8	-
6.	1.1191	27.5	-	27.9	-	0.1	0.1	0.0	28.1	-	56.0	46.0	27.9	-
7.	2.5622	26.5	-	27.3	-	0.1	0.2	0.0	27.6	-	56.0	46.0	28.4	-
8.	14.2646	31.6	-	32.3	-	0.5	0.6	0.0	33.4	-	60.0	50.0	26.6	-

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

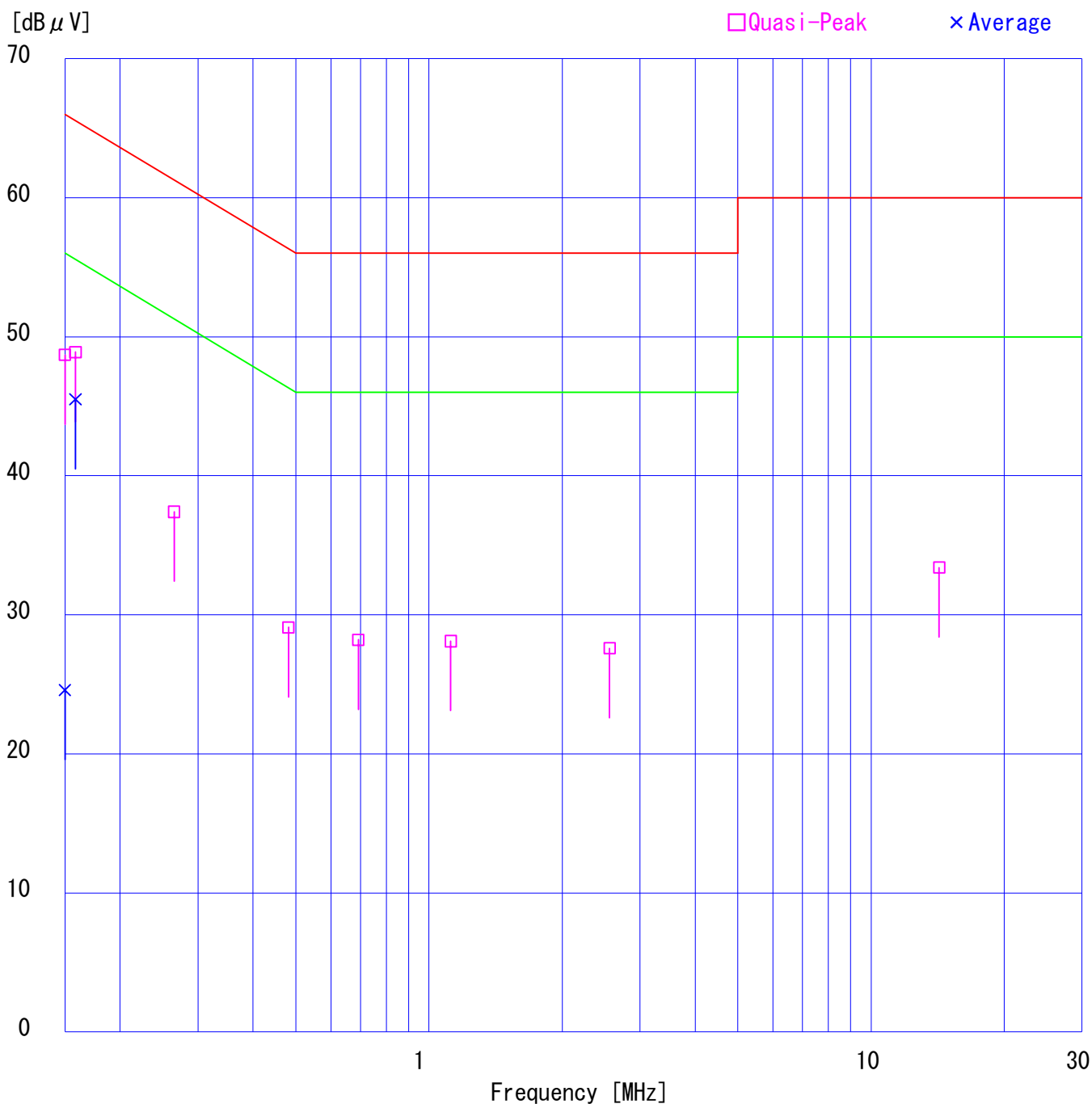
■ LISN: KLS-06 (NSLK8127) ■ COAXIAL CABLE: KCC-33/34
 ■ EMI RECEIVER: KTR-01 (ES140)

DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz (3DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22)

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

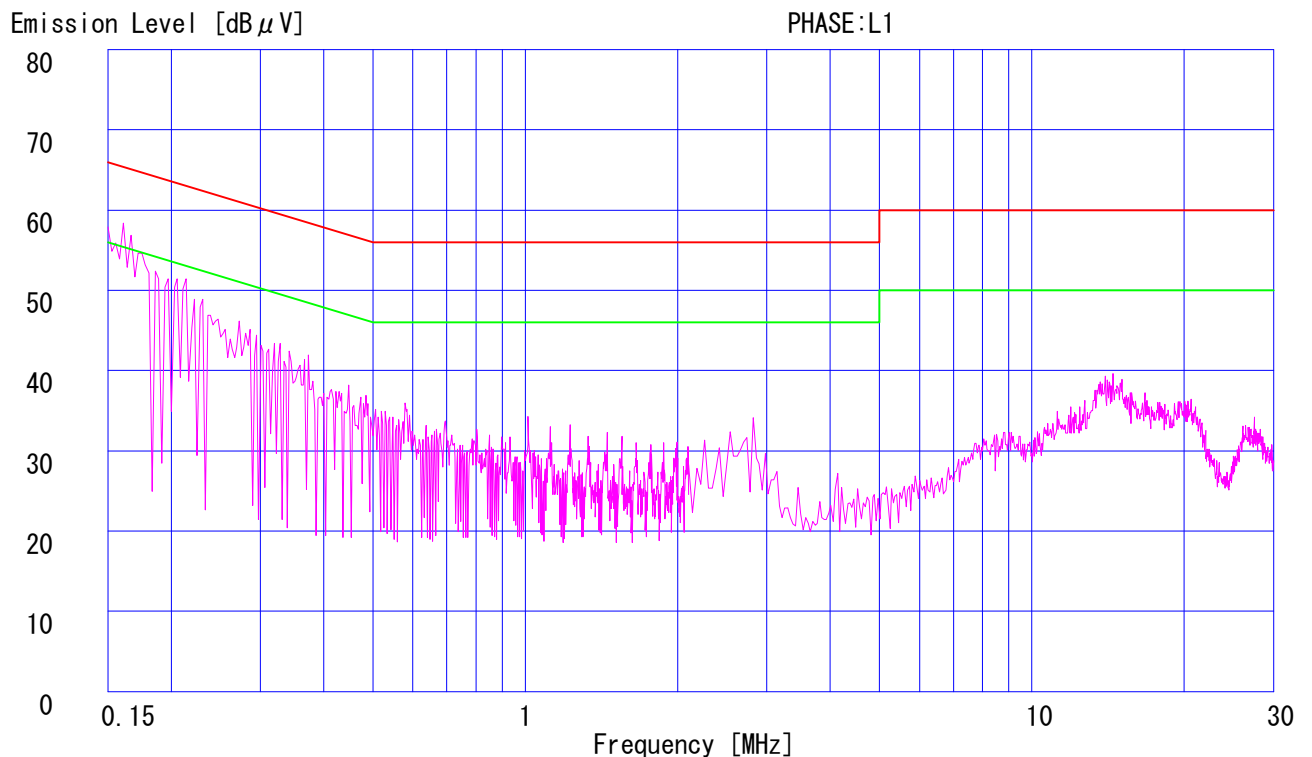
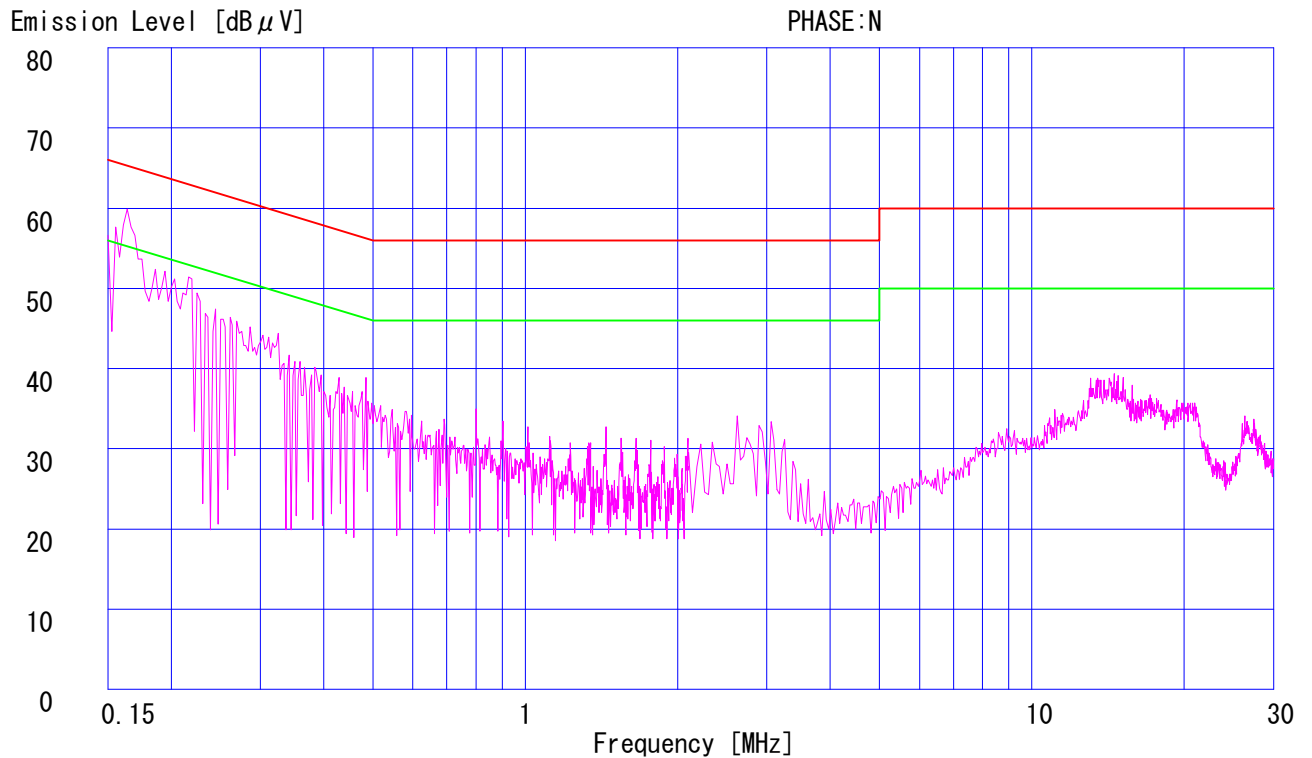
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz (3DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

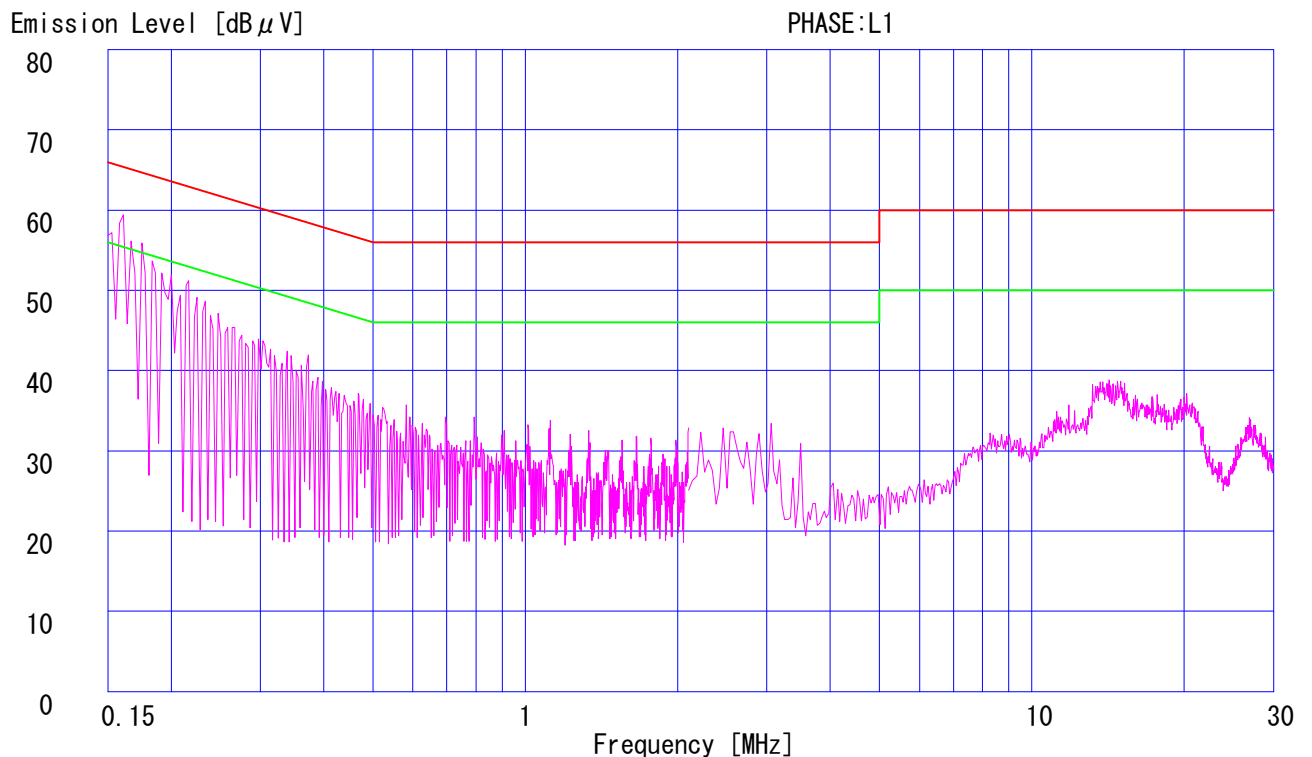
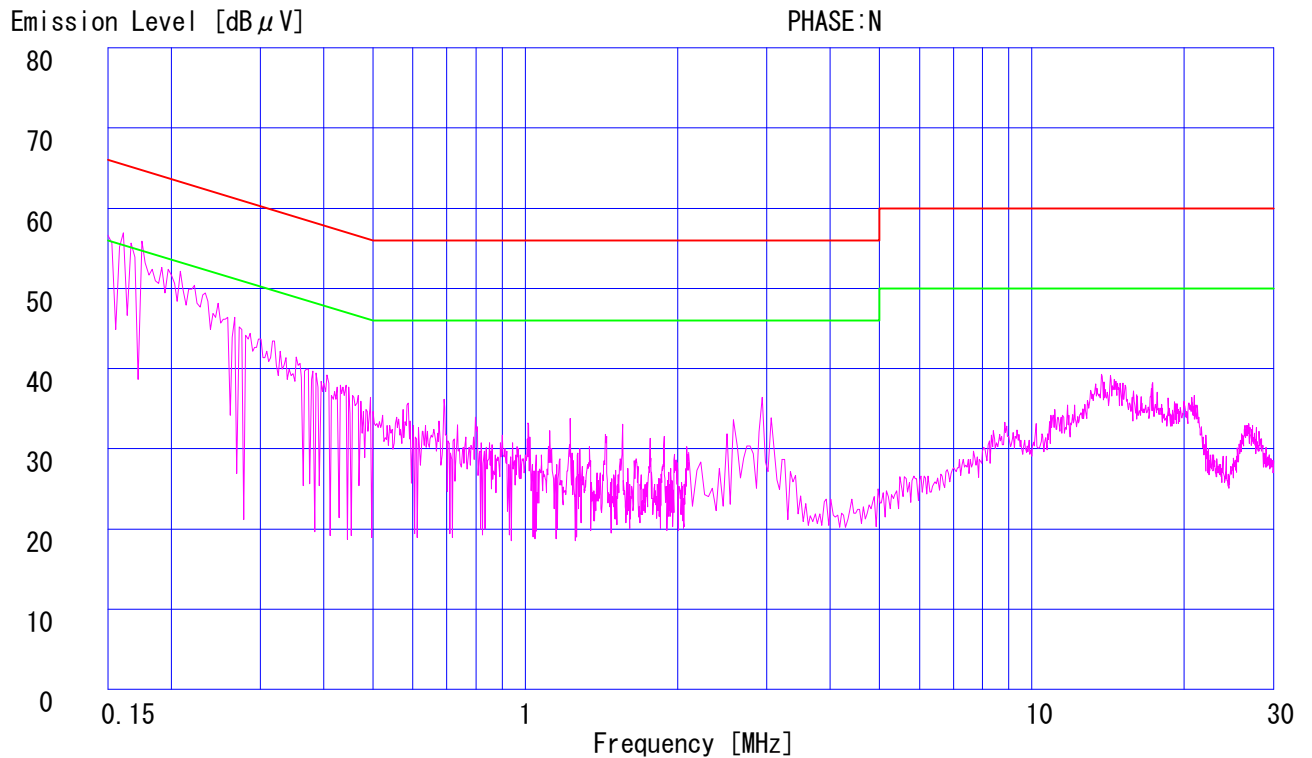
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2441MHz (3DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



DATA OF CONDUCTION TEST CHART

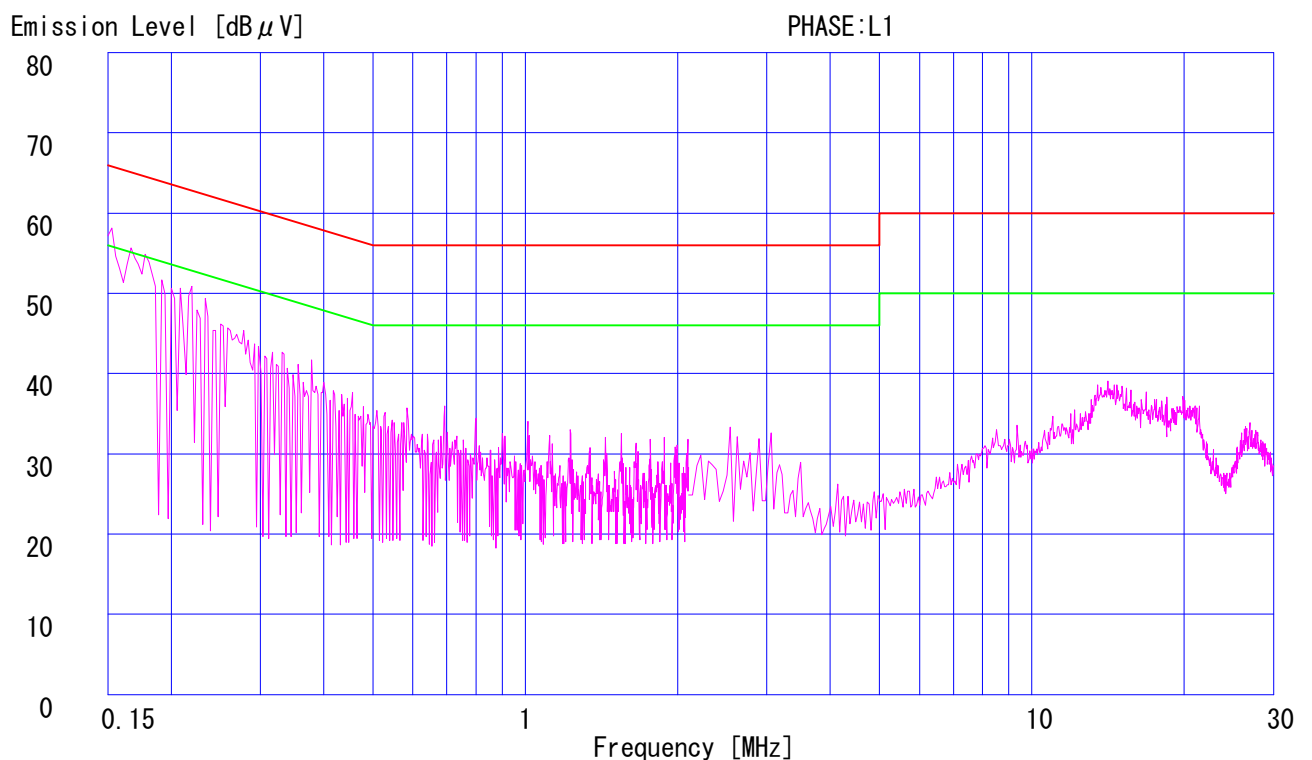
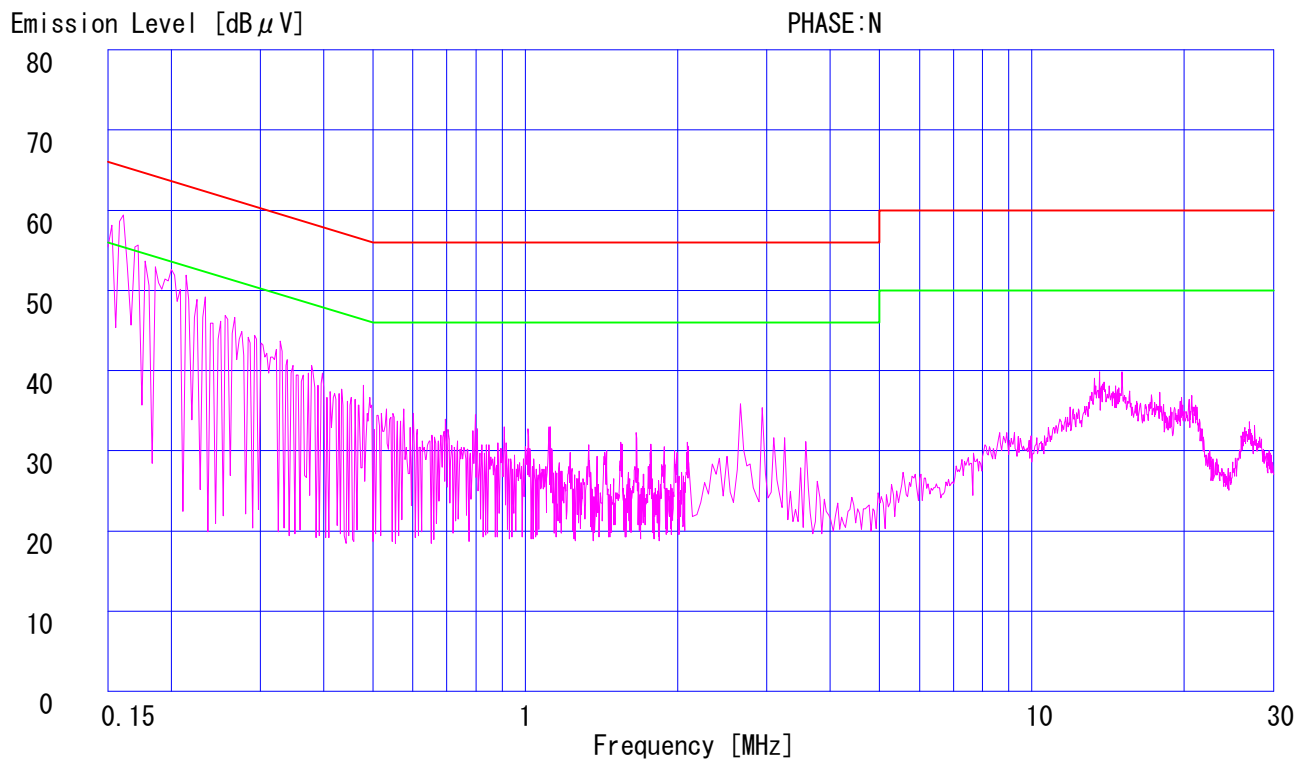
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2480MHz (3DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/16/2008
Phase : Single Phase
Temperature : 26 °C
Humidity : 44 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Tatsuya Arai



DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz (DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/19/2008
Test Distance : 3 m
Temperature : 22 °C
Humidity : 55 %
Regulation : FCC Part15C § 15.209

Engineer : Go Ishiwata

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]	HOR [dB]	VER [dB]		
1.	49.28	BB	28.6	45.2	10.5	28.5	1.4	6.0	18.0	34.6	40.0	22.0	5.4	
2.	147.48	BB	34.3	35.4	14.6	28.1	2.6	6.0	29.4	30.5	43.5	14.1	13.0	
3.	179.56	BB	34.4	28.9	16.2	27.9	2.9	6.0	31.6	26.1	43.5	11.9	17.4	
4.	336.04	BB	34.6	32.0	15.5	27.8	4.0	6.0	32.3	29.7	46.0	13.7	16.3	

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2402MHz (DH5)
 Remarks : Antenna: HFS37-NE01 PK (RBW:1MHz, VBW:1MHz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) (PK) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	2390.00	BB	46.4	47.0	28.5	35.4	4.4	0.0	43.9	44.5	74.0	30.1	29.5
2.	4804.00	BB	51.5	50.4	32.9	34.1	5.9	0.0	56.2	55.1	74.0	17.8	18.9
3.	7206.00	BB	45.7	43.6	36.5	34.7	7.1	0.0	54.6	52.5	74.0	19.4	21.5
4.	9608.00	BB	46.4	45.2	37.7	35.3	8.2	0.0	57.0	55.8	74.0	17.0	18.2

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2402MHz (DH5)
 Remarks : Antenna: HFS37-NE01 AV (RBW:1MHz, VBW:300Hz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	2390.00	BB	33.1	33.2	28.5	35.4	4.4	0.0	30.6	30.7	54.0	23.4	23.3
2.	4804.00	BB	45.7	45.0	32.9	34.1	5.9	0.0	50.4	49.7	54.0	3.6	4.3
3.	7206.00	BB	33.2	31.1	36.5	34.7	7.1	0.0	42.1	40.0	54.0	11.9	14.0
4.	9608.00	BB	34.2	32.1	37.7	35.3	8.2	0.0	44.8	42.7	54.0	9.2	11.3

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2441MHz (DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/19/2008
Test Distance : 3 m
Temperature : 22 °C
Humidity : 55 %
Regulation : FCC Part15C § 15.209

Engineer : Go Ishiwata

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]	HOR [dB]	VER [dB]		
1.	51.33	BB	28.8	45.5	9.9	28.5	1.4	6.0	17.6	34.3	40.0	22.4	5.7	
2.	147.47	BB	34.4	35.1	14.6	28.1	2.6	6.0	29.5	30.2	43.5	14.0	13.3	
3.	178.99	BB	34.3	29.0	16.2	27.9	2.9	6.0	31.5	26.2	43.5	12.0	17.3	
4.	336.04	BB	34.9	31.8	15.5	27.8	4.0	6.0	32.6	29.5	46.0	13.4	16.5	

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz

■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2441MHz (DH5)
 Remarks : Antenna: HFS37-NE01 PK (RBW:1MHz, VBW:1MHz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	4882.00	BB	48.3	45.8	33.1	34.1	6.0	0.0	53.3	50.8	74.0	20.7	23.2
2.	7323.00	BB	45.1	43.8	36.7	34.8	7.1	0.0	54.1	52.8	74.0	19.9	21.2
3.	9764.00	BB	47.2	45.1	37.7	35.4	8.2	0.0	57.7	55.6	74.0	16.3	18.4

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2441MHz (DH5)
 Remarks : Antenna: HFS37-NE01 AV (RBW:1MHz, VBW:300Hz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	4882.00	BB	39.1	34.7	33.1	34.1	6.0	0.0	44.1	39.7	54.0	9.9	14.3
2.	7323.00	BB	32.9	30.8	36.7	34.8	7.1	0.0	41.9	39.8	54.0	12.1	14.2
3.	9764.00	BB	34.0	31.9	37.7	35.4	8.2	0.0	44.5	42.4	54.0	9.5	11.6

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2480MHz (DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/19/2008
Test Distance : 3 m
Temperature : 22 °C
Humidity : 55 %
Regulation : FCC Part15C § 15.209

Engineer : Go Ishiwata

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	51.91	BB	29.0	45.4	9.8	28.5	1.5	6.0	17.8	34.2	40.0	22.2	5.8	
2.	147.48	BB	34.0	35.2	14.6	28.1	2.6	6.0	29.1	30.3	43.5	14.4	13.2	
3.	179.32	BB	34.1	29.0	16.2	27.9	2.9	6.0	31.3	26.2	43.5	12.2	17.3	
4.	336.05	BB	34.6	32.0	15.5	27.8	4.0	6.0	32.3	29.7	46.0	13.7	16.3	

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2480MHz (DH5)
 Remarks : Antenna: HFS37-NE01 PK (RBW:1MHz, VBW:1MHz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) (PK) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	2483.50	BB	49.5	48.3	28.3	35.3	4.5	0.0	47.0	45.8	74.0	27.0	28.2
2.	4960.00	BB	46.0	45.9	33.4	34.1	6.0	0.0	51.3	51.2	74.0	22.7	22.8
3.	7440.00	BB	45.0	43.6	36.8	34.8	7.1	0.0	54.1	52.7	74.0	19.9	21.3
4.	9920.00	BB	46.8	44.2	37.7	35.4	8.3	0.0	57.4	54.8	74.0	16.6	19.2

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2480MHz (DH5)
 Remarks : Antenna: HFS37-NE01 AV (RBW:1MHz, VBW:300Hz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	2483.50	BB	37.5	37.9	28.3	35.3	4.5	0.0	35.0	35.4	54.0	19.0	18.6	
2.	4960.00	BB	35.4	36.0	33.4	34.1	6.0	0.0	40.7	41.3	54.0	13.3	12.7	
3.	7440.00	BB	32.7	30.4	36.8	34.8	7.1	0.0	41.8	39.5	54.0	12.2	14.5	
4.	9920.00	BB	33.8	31.7	37.7	35.4	8.3	0.0	44.4	42.3	54.0	9.6	11.7	

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2402MHz (3DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/19/2008
Test Distance : 3 m
Temperature : 22 °C
Humidity : 55 %
Regulation : FCC Part15C § 15.209

Engineer : Go Ishiwata

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]	HOR [dB]	VER [dB]		
1.	50.74	BB	28.8	45.6	10.1	28.5	1.4	6.0	17.8	34.6	40.0	22.2	5.4	
2.	147.47	BB	33.6	35.5	14.6	28.1	2.6	6.0	28.7	30.6	43.5	14.8	12.9	
3.	177.89	BB	34.0	29.3	16.2	27.9	2.9	6.0	31.2	26.5	43.5	12.3	17.0	
4.	336.04	BB	34.4	32.1	15.5	27.8	4.0	6.0	32.1	29.8	46.0	13.9	16.2	

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2402MHz (3DH5)
 Remarks : Antenna: HFS37-NE01 PK (RBW:1MHz, VBW:1MHz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) (PK) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	2390.00	BB	45.9	48.0	28.5	35.4	4.4	0.0	43.4	45.5	74.0	30.6	28.5
2.	4804.00	BB	46.0	44.4	32.9	34.1	5.9	0.0	50.7	49.1	74.0	23.3	24.9
3.	7206.00	BB	44.0	43.7	36.5	34.7	7.1	0.0	52.9	52.6	74.0	21.1	21.4
4.	9608.00	BB	44.6	46.5	37.7	35.3	8.2	0.0	55.2	57.1	74.0	18.8	16.9

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2402MHz (3DH5)
 Remarks : Antenna: HFS37-NE01 AV (RBW:1MHz, VBW:300Hz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	2390.00	BB	32.7	35.2	28.5	35.4	4.4	0.0	30.2	32.7	54.0	23.8	21.3
2.	4804.00	BB	34.2	33.8	32.9	34.1	5.9	0.0	38.9	38.5	54.0	15.1	15.5
3.	7206.00	BB	31.2	31.0	36.5	34.7	7.1	0.0	40.1	39.9	54.0	13.9	14.1
4.	9608.00	BB	32.2	33.1	37.7	35.3	8.2	0.0	42.8	43.7	54.0	11.2	10.3

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.

YAMAKITA No.1 ANECHOIC CHAMBER

Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e6
Power : DC3.3V (AC120V/60Hz)
Mode : Tx:2441MHz (3DH5)
Remarks : Antenna: HFS37-NE01
Date : 5/19/2008
Test Distance : 3 m
Temperature : 22 °C
Humidity : 55 %
Regulation : FCC Part15C § 15.209

Engineer : Go Ishiwata

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	51.32	BB	28.7	45.9	9.9	28.5	1.4	6.0	17.5	34.7	40.0	22.5	5.3	
2.	147.48	BB	34.0	35.2	14.6	28.1	2.6	6.0	29.1	30.3	43.5	14.4	13.2	
3.	179.41	BB	34.2	28.7	16.2	27.9	2.9	6.0	31.4	25.9	43.5	12.1	17.6	
4.	336.05	BB	34.7	31.7	15.5	27.8	4.0	6.0	32.4	29.4	46.0	13.6	16.6	

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2441MHz (3DH5)
 Remarks : Antenna: HFS37-NE01 PK (RBW:1MHz, VBW:1MHz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209 (a) (PK) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	4882.00	BB	44.2	45.3	33.1	34.1	6.0	0.0	49.2	50.3	74.0	24.8	23.7
2.	7323.00	BB	43.3	44.0	36.7	34.8	7.1	0.0	52.3	53.0	74.0	21.7	21.0
3.	9764.00	BB	45.3	45.2	37.7	35.4	8.2	0.0	55.8	55.7	74.0	18.2	18.3

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2441MHz (3DH5)
 Remarks : Antenna: HFS37-NE01 AV (RBW:1MHz, VBW:300Hz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	4882.00	BB	30.9	31.6	33.1	34.1	6.0	0.0	35.9	36.6	54.0	18.1	17.4	
2.	7323.00	BB	30.9	31.0	36.7	34.8	7.1	0.0	39.9	40.0	54.0	14.1	14.0	
3.	9764.00	BB	32.0	32.1	37.7	35.4	8.2	0.0	42.5	42.6	54.0	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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2480MHz (3DH5)
 Remarks : Antenna: HFS37-NE01
 Date : 5/19/2008
 Test Distance : 3 m
 Temperature : 22 °C
 Humidity : 55 %
 Regulation : FCC Part15C § 15.209

Engineer : Go Ishiwata

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	49.02	BB	29.0	45.2	10.5	28.5	1.4	6.0	18.4	34.6	40.0	21.6	5.4	
2.	147.47	BB	33.7	35.3	14.6	28.1	2.6	6.0	28.8	30.4	43.5	14.7	13.1	
3.	179.41	BB	34.5	28.9	16.2	27.9	2.9	6.0	31.7	26.1	43.5	11.8	17.4	
4.	336.05	BB	34.8	31.9	15.5	27.8	4.0	6.0	32.5	29.6	46.0	13.5	16.4	

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

■ ANTENNA: KBA-03 (BBA9106) 30-299.99MHz/KLA-03 (USLP9143) 300-1000MHz
 ■ CABLE: KCC-30/31/32/34 ■ PREAMP: KAF-05 (8447D) ■ EMI RECEIVER: KTR-04 (ESVS10)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2480MHz (3DH5)
 Remarks : Antenna: HFS37-NE01 PK (RBW:1MHz, VBW:1MHz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) (PK) 1-18GHz:3m/18-40GHz:1m

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					HOR [dB μ V/m]	VER		HOR [dB]	VER
1.	2483.50	BB	55.1	54.7	28.3	35.3	4.5	0.0	52.6	52.2	74.0	21.4	21.8
2.	4960.00	BB	44.2	43.3	33.4	34.1	6.0	0.0	49.5	48.6	74.0	24.5	25.4
3.	7440.00	BB	43.4	44.0	36.8	34.8	7.1	0.0	52.5	53.1	74.0	21.5	20.9
4.	9920.00	BB	44.6	44.9	37.7	35.4	8.3	0.0	55.2	55.5	74.0	18.8	18.5

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-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

DATA OF RADIATION TEST

UL Japan, Inc.
YAMAKITA No.1 ANECHOIC CHAMBER
Report No. : 281E0228-YK-01-A

Applicant : Alps Electric Co., Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e6
 Power : DC3.3V (AC120V/60Hz)
 Mode : Tx:2480MHz (3DH5)
 Remarks : Antenna: HFS37-NE01 AV (RBW:1MHz, VBW:300Hz)
 Date : 5/16/2008
 Test Distance : 3 m
 Temperature : 26 °C Engineer : Tatsuya Arai
 Humidity : 43 %
 Regulation : FCC Part15C § 15.209(a) 1-18GHz:3m/18-40GHz:1m

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μ V]	VER					HOR [dB μ V/m]	VER	HOR [dB]	VER		
1.	2483.50	BB	43.5	44.1	28.3	35.3	4.5	0.0	41.0	41.6	54.0	13.0	12.4	
2.	4960.00	BB	30.7	30.8	33.4	34.1	6.0	0.0	36.0	36.1	54.0	18.0	17.9	
3.	7440.00	BB	30.8	30.7	36.8	34.8	7.1	0.0	39.9	39.8	54.0	14.1	14.2	
4.	9920.00	BB	31.9	31.7	37.7	35.4	8.3	0.0	42.5	42.3	54.0	11.5	11.7	

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

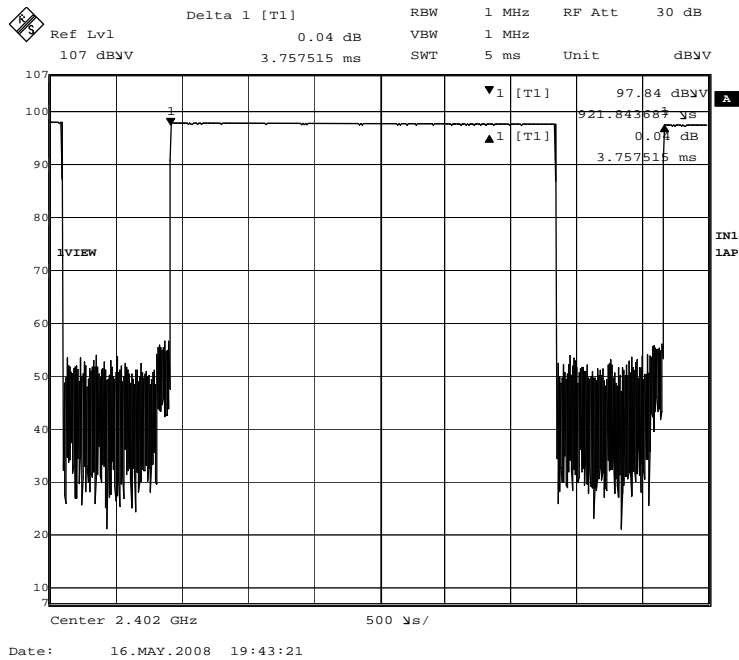
■ ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26GHz
 ■ CABLE:KCC-D16/D17 ■ PREAMP:KAF-07 (8449B) ■ EMI RECEIVER:KTR-01 (ES140)

Duty Cycle

COMPANY : Alps Electric Co.,Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e6
POWER : AC120V/60Hz

REPORT NO : 28IE0228-YK-A
DATE : 2008/05/19
TEMP./HUMI : 22deg.C./55%
TEST MODE : Tx2402MHz
ENGINEER : Tatsuya Arai

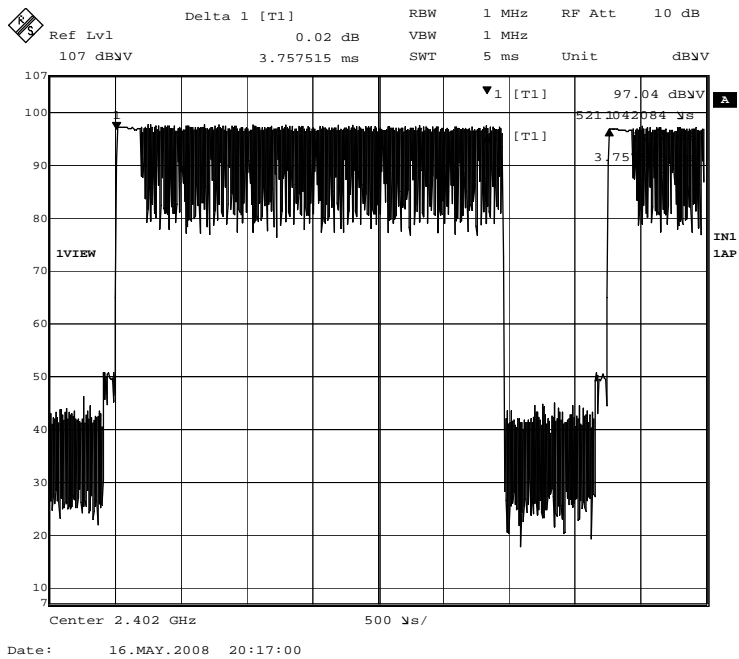
Tx2402MHz DH5



Duty Cycle: 3.76ms

AV Detector VBW: 1000 / 3.76ms = 265.96Hz → 300Hz

Tx2402MHz DH5



Duty Cycle: 3.76ms

AV Detector VBW: 1000 / 3.76ms = 265.96Hz → 300Hz

- * All the measured noise was pulse emission.
- * Duty cycle was within 100msec.

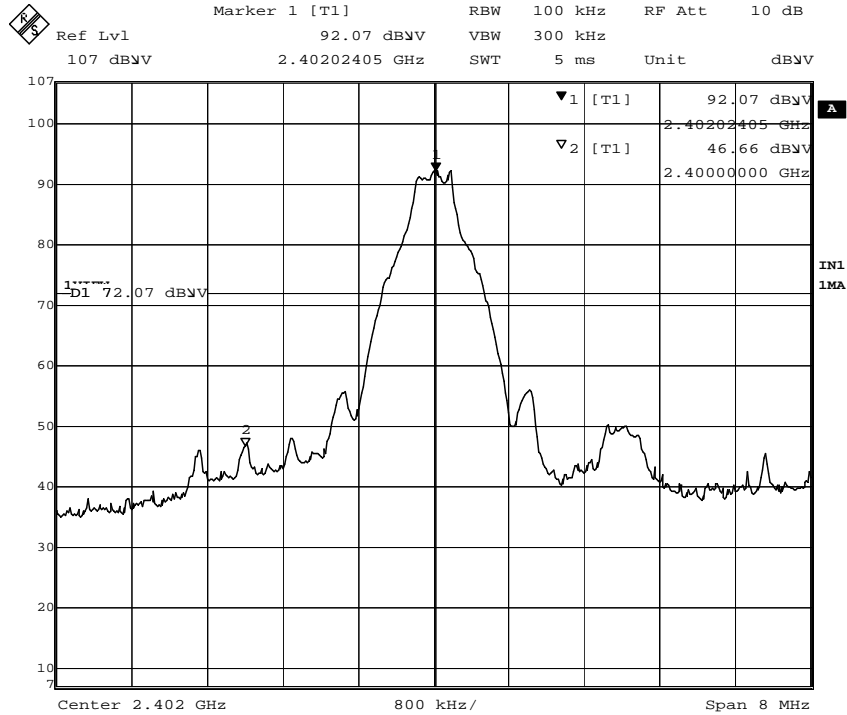
Band Edge (2400MHz)

COMPANY : Alps Electric Co.,Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e6
POWER : AC120V/60Hz

REPORT NO : 28IE0228-YK-A
DATE : 2008/05/19
TEMP./HUMI : 22deg.C./55%
TEST MODE : Tx2402MHz
ENGINEER : Tatsuya Arai

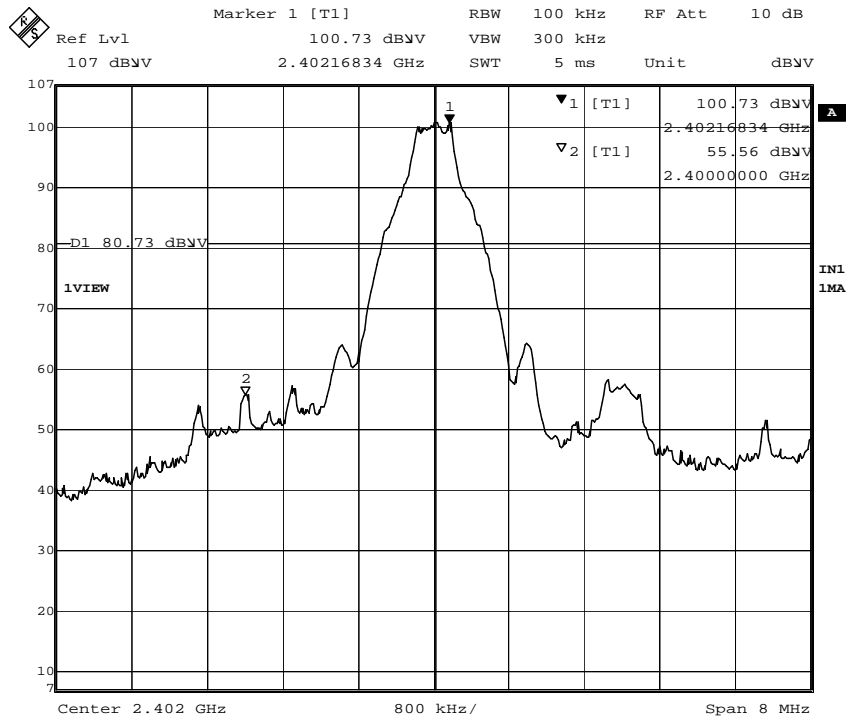
Tx2402MHz DH5

Antenna: Horizontal



Date: 16.MAY.2008 21:44:08

Antenna: Vertical



Date: 16.MAY.2008 21:30:50

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
YA-RE	Radiated emission(software)	UL Japan	RE(Ver.1.5)	RE	-
KAEC-01	Anechoic Chamber	JSE	Semi 3m	RE	2007/08/26 * 12
KAF-05	Pre Amplifier	Agilent	8447D	RE	2008/04/08 * 12
KAT6-01	Attenuator	INMET	18N-6dB	RE	2008/03/17 * 12
KBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2007/12/27 * 12
KCC-30/31/32/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	RE	2008/05/12 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2007/12/27 * 12
KOS-02	Humidity Indicator	Custom	CTH-190	RE	2006/07/10 * 24
KSA-04	Spectrum Analyzer	Advantest	R3271A	RE/CE	2007/09/25 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2008/04/18 * 12
KJM-07	Measure	KOMELON	KMC-36	RE	-
KTR-04	Test Receiver	Rohde & Schwarz	ESVS10	RE	2007/10/30 * 12
KAF-07	Pre Amplifier	Hewlett Packard	8449B	RE	2007/12/10 * 12
KCC-D16/D17	Coaxial Cable	INSULATED WIRE INC	KPS-1501-200-KPS/KPS-1501-2000-KPS	RE	2008/02/21 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2007/08/14 * 12
KHA-03	Horn Antenna	EMCO	3160-09	RE	2008/04/30 * 12
YA-CE	Conducted emission(software)	UL Japan	CE(Ver.1.6)	CE	-
KCC-33/34/KRM-03	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	5D-2W/S04272B/RFM-E421	CE	2007/11/01 * 12
KLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2007/09/20 * 12
KOS-01	Humidity Indicator	Custom	CTH-190	CE	2006/07/14 * 24
KTR-03	Test Receiver	Rohde & Schwarz	ESHS10	CE	2008/02/18 * 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: Radiated emission,