



RADIO TEST REPORT

Test Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co., Ltd.
Type of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
FCC ID : CWTUGPZ6-C3
Test Standard : FCC Part15 Subpart C: 2007
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: November 7, 8, 9 and 12, 2007

Tested by: T. Imamura & T. Arai
Toyokazu Imamura & Tatsuya Arai

M. Hosaka & G. Ishiwata
Makoto Hosaka & Go Ishiwata

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

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

Table of Contents	Page
1 Applicant Information	3
2 Equipment under test (E.U.T.)	3
3 Test Specification, Procedures and Results	4
4 System Test Configuration	6
5 Conducted emission	7
6 Carrier Frequency Separation	7
7 20dB Bandwidth & Occupied Bandwidth (99%)	7
8 Number of Hopping Frequency	8
9 Dwell time	8
10 Maximum Peak Output Power	8
11 Out of Band Emissions (Antenna Port Conducted)	8
12 Out of Band Emissions (Radiated)	9
<u>Contents of Appendixes</u>	10
APPENDIX 1: Photographs of test setup	11
APPENDIX 2: Test Data	15
APPENDIX 3: Test instruments	89

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

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. : 0002c752d0e9
Rating : DC 3.3V
Country of Manufacture : Japan
Receipt Date of Sample : November 1, 2007
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 : ANTB24-057A0 ($\pi/4$ monopole)
Antenna gain with cable loss : -2.0dBi
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.

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

3 Test Specification, Procedures and Results

3.1 Test specification

Test specification : FCC Part15 Subpart C: 2007
 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	18.2dB (0.1500MHz, QP, N, Tx 2402MHz, 3DH5)	Complied
Carrier Frequency Separation	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)	Conducted	N/A	*See data.	Complied
20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)	Conducted	N/A		Complied
Number of Hopping Frequency	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Dwell time	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247 (b)(1)	Conducted	N/A		Complied
Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.209 Section15.247 (d)	Conducted / Radiated	N/A	1.8dB (2483.50MHz, AV, Horizontal, Tx 2480MHz 3DH5)	Complied

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

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

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators RSS-Gen 4.4.1	RSS-Gen 4.4.1	Conducted	-	Complied

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

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

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

Antenna port conducted test	
Below 1GHz	±0.4dB
1GHz and above	±0.7dB

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

UL Japan, Inc. 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. : 2973B-1

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. : 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

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

4 System Test Configuration

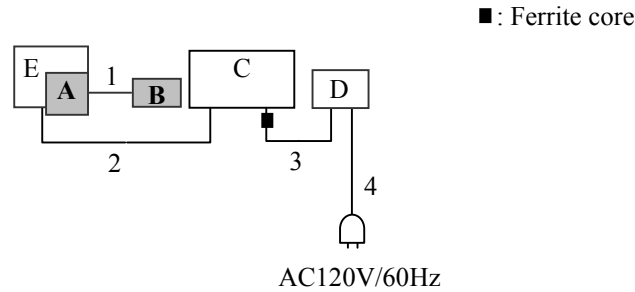
4.1 Justification

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

Test mode: Transmitting (Packet size: DH5 and 3DH5)
 - Low channel : 2402MHz
 - Middle channel : 2441MHz
 - High channel : 2480MHz
 - Hopping
 - Inquiry

*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



* 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	0002c752d0e9	ALPS	CWTUGPZ6-C3 (EUT)
B	Antenna	ANTB24-057A0	-	Sansei	EUT
C	Notebook PC	2626-20J	AA-D1HVZ98/11	IBM	-
D	AC Adapter	02K6665	11S02K6665Z1Z2 U8192T6Y	IBM	-
E	Testing Board	-	-	-	-(Test jig)

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Antenna cable	0.5	Shielded	Shielded	-
2	USB cable	0.95	Shielded	Shielded	-
3	DC cable	1.7	Unshielded	Unshielded	-
4	AC cable	0.9	Unshielded	Unshielded	-

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

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 : November 8, 2007 Test engineer : Makoto Hosaka

6 Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Date : November 9, 2007 Test engineer : Tatsuya Arai

7 20dB Bandwidth & Occupied Bandwidth (99%)

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port. The channel separation in Hopping mode and Inquiry mode was separated by 25kHz and 2/3 of the 20dB bandwidth.

Summary of the test results: Pass

Date : November 12, 2007 Test engineer : Toyokazu Imamura

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

8 Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Date : November 9, 2007 Test engineer : Tatsuya Arai

9 Dwell time

Test Procedure

The Dwell time was measured with a spectrum analyzer connected to the antenna port.
Measurement was performed with the packet type of DH1, DH3, DH5, 3DH1, 3DH3 and 3DH5.

Summary of the test results: Pass

Date : November 9, 2007 Test engineer : Tatsuya Arai

10 Maximum Peak Output Power

Test Procedure

The Maximum Peak Output Power was measured with a power meter connected to the antenna port.

Summary of the test results: Pass

Date : November 9, 2007 Test engineer : Tatsuya Arai

11 Out of Band Emissions (Antenna Port Conducted)

Test Procedure

The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port.

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 conducted measurement.

Summary of the test results: Pass

Date : November 12, 2007 Test engineer : Toyokazu Imamura

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

12 Out of Band Emissions (Radiated)

12.1 Operating environment

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

12.2 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.

12.3 Test conditions

Frequency range : 30MHz - 26.5GHz
 Test distance : 3m
 EUT operation mode : Transmitting

12.4 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 13 to 14. 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: X

12.5 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.

12.6 Results

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

Date : November 7 and 8, 2007 Test engineer : Go Ishiwata and Makoto Hosaka

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

APPENDIX 1: Photographs of test setup

Page 11	:	Conducted emission
Page 12	:	Radiated emission
Page 13-14	:	Pre-check of the worst position

APPENDIX 2: Test Data

Page 15 - 24	:	Conducted emission
Page 25	:	Carrier frequency separation
Page 26 - 28	:	20dB bandwidth
Page 29 - 33	:	Number of hopping frequency
Page 34 - 47	:	Dwell time
Page 48	:	Maximum peak output power
Page 49 - 66	:	Out of band emissions (Antenna Port Conducted)
Page 67 - 84	:	Out of band emissions (Radiated)
Page 85 - 87	:	Occupied bandwidth
Page 88	:	Duty cycle

APPENDIX 3: Test instruments

Page 89	:	Test instruments
---------	---	------------------

UL Japan, Inc.

YAMAKITA EMC LAB.

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

Telephone: +81 465 77 1011 Facsimile: +81 465 77 2112

MF060b (18.06.07)

DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
 Kind of Equipment : Bluetooth Transceiver Module
 Model No. : UGPZ6-C3
 Serial No. : 0002c752d0e9
 Power : AC120V/60Hz
 Mode : Tx:2402MHz (DH5)
 Remarks : -
 Date : 11/8/2007
 Phase : Single Phase
 Temperature : 25 °C
 Humidity : 49 %
 Regulation : FCC Part15C § 15. 207. (CISPR Pub. 22)

Engineer : Makoto Hosaka

No.	FREQ. [MHz]	READING(N)		READING(L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μ V]	AV	QP [dB μ V]	AV				QP [dB]	AV [dB μ V]	QP [dB μ V]	AV [dB μ V]	QP [dB]	AV [dB]
1.	0.1500	47.3	24.7	47.3	24.1	0.1	0.1	0.0	47.5	24.9	66.0	56.0	18.5	31.1
2.	0.2029	42.4	15.7	43.5	17.9	0.1	0.1	0.0	43.7	18.1	63.5	53.5	19.8	35.4
3.	0.2608	36.0	-	38.7	-	0.1	0.1	0.0	38.9	-	61.4	51.4	22.5	-
4.	0.3196	31.5	-	35.2	-	0.1	0.1	0.0	35.4	-	59.7	49.7	24.3	-
5.	0.3947	27.6	-	31.3	-	0.1	0.1	0.0	31.5	-	58.0	48.0	26.5	-
6.	23.3350	26.2	-	26.4	-	0.7	0.7	0.0	27.8	-	60.0	50.0	32.2	-

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

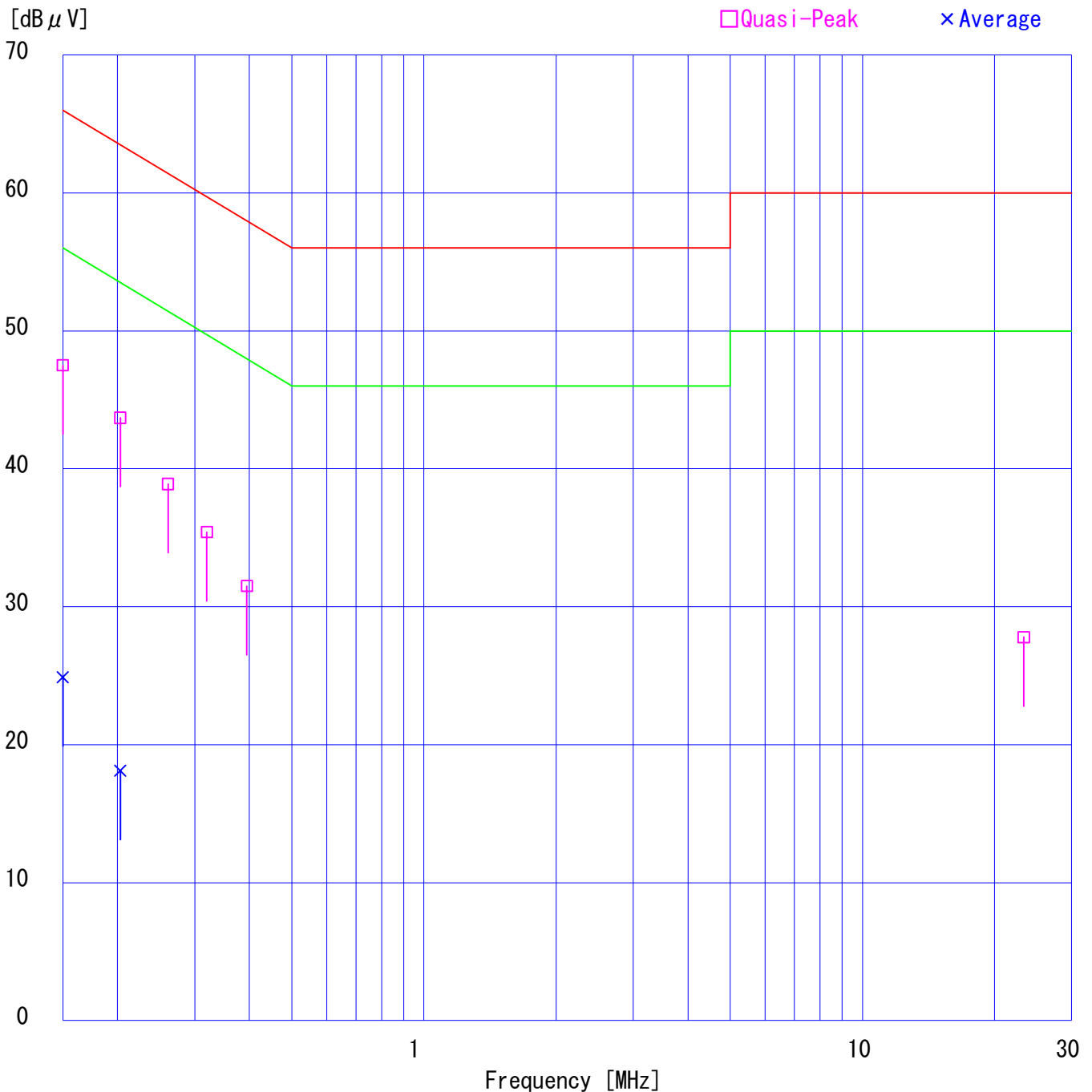
■ KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-33/34
 ■ EMI RECEIVER: KTR-05 (ESC1)

DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2402MHz (DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation : FCC Part15C § 15. 207. (CISPR Pub. 22)

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST CHART

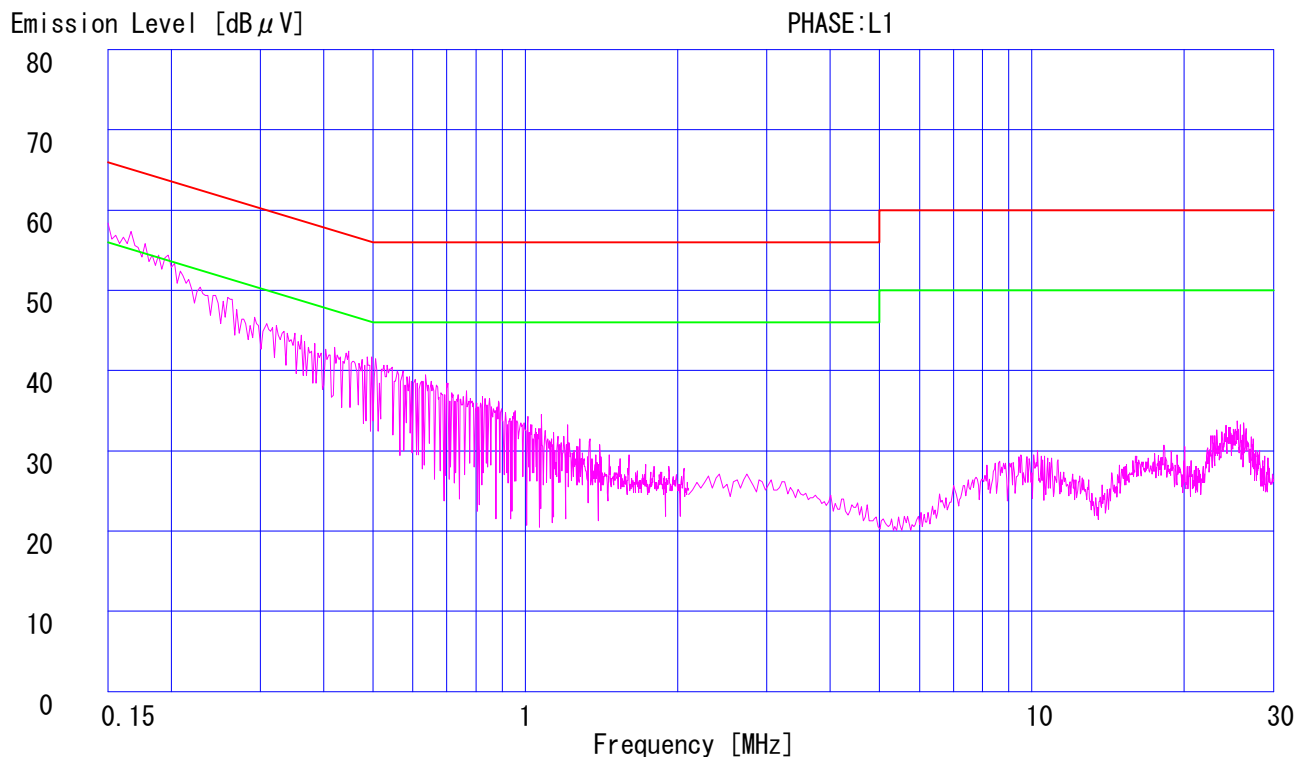
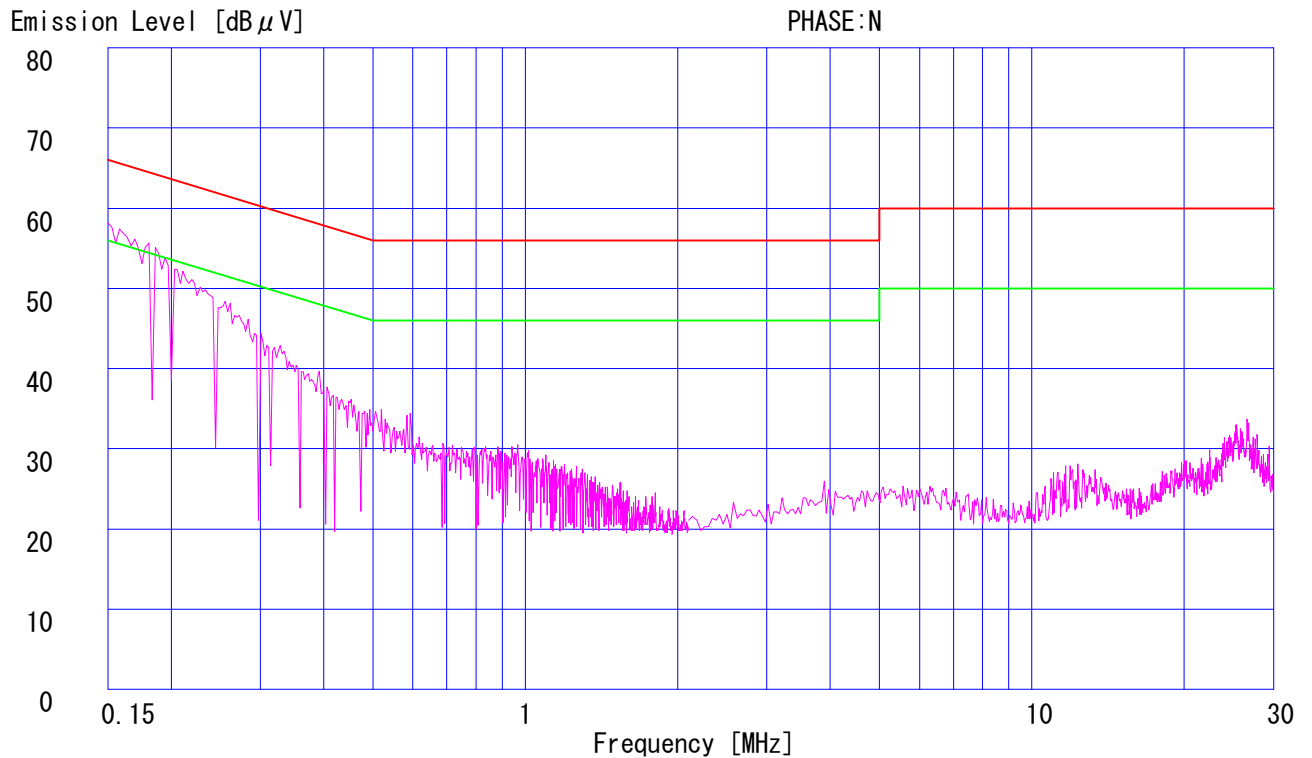
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2402MHz (DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation 1 : FCC Part15C § 15. 207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST CHART

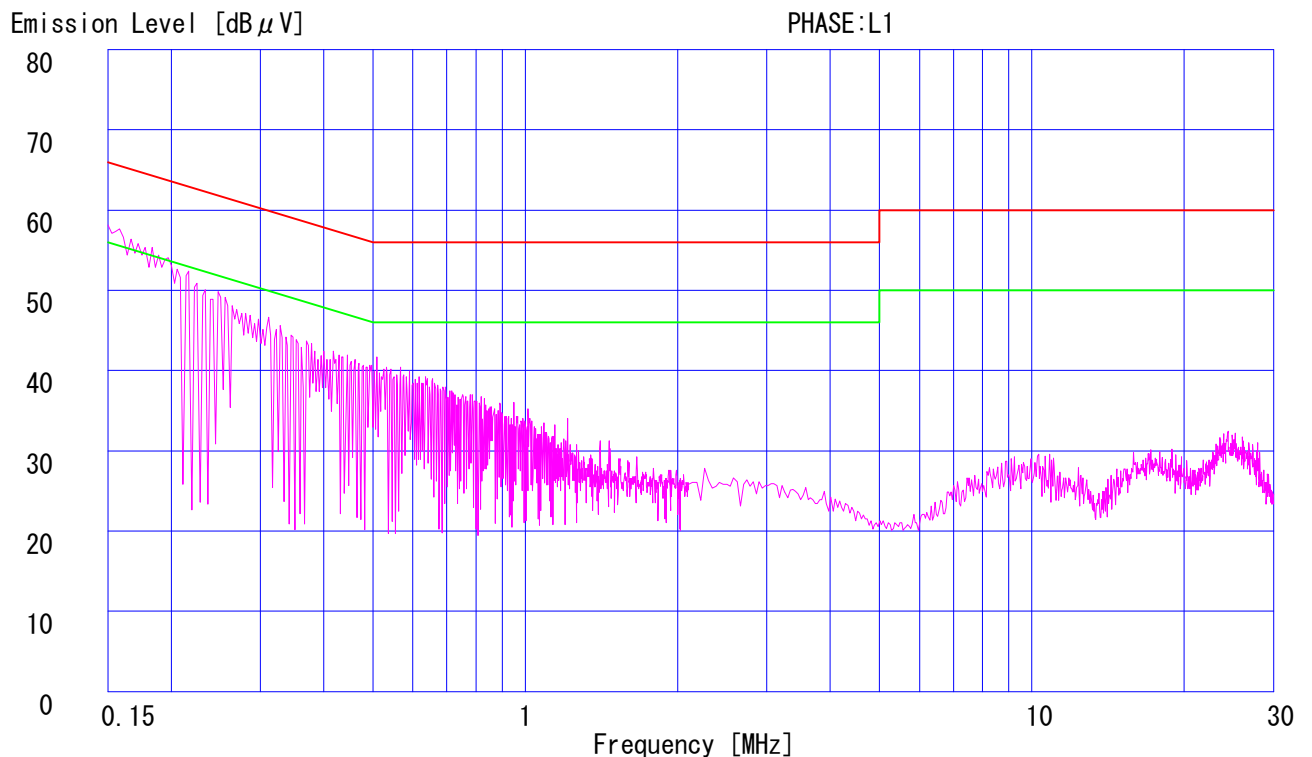
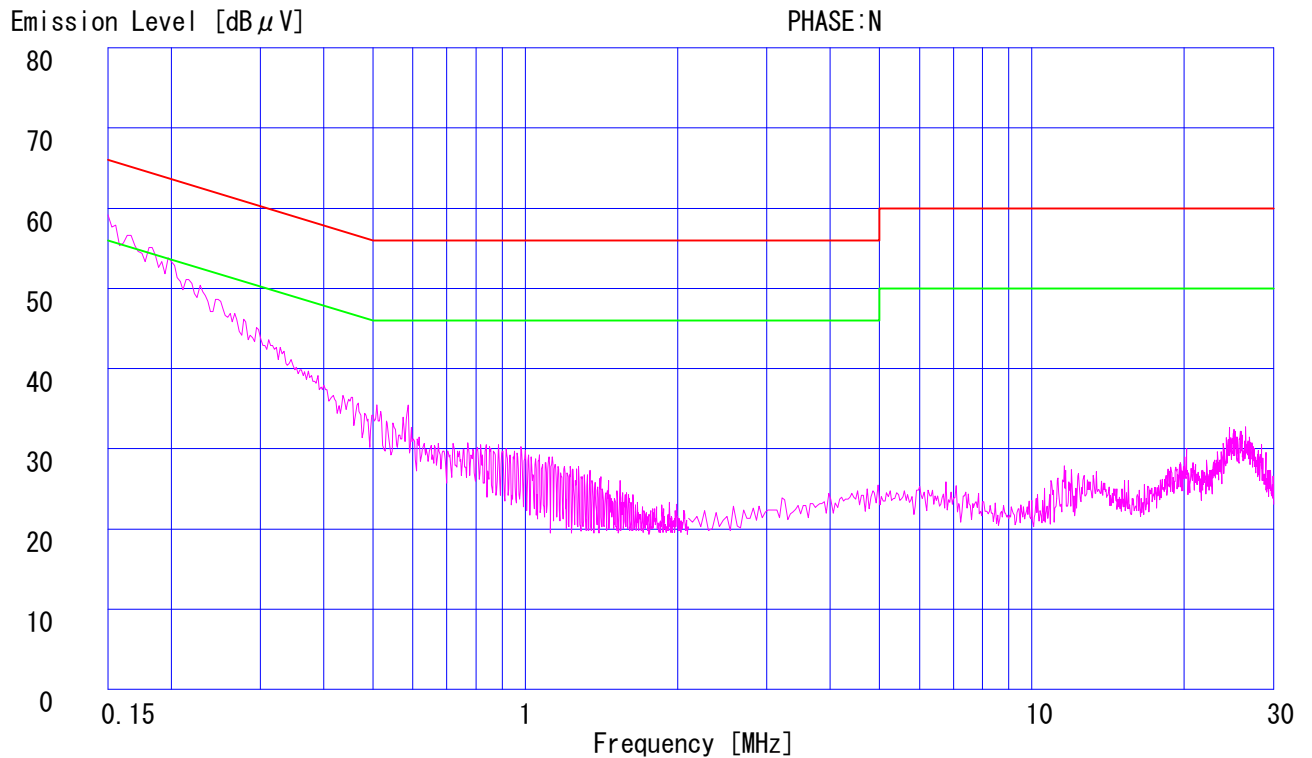
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2441MHz (DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation 1 : FCC Part15C § 15. 207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST CHART

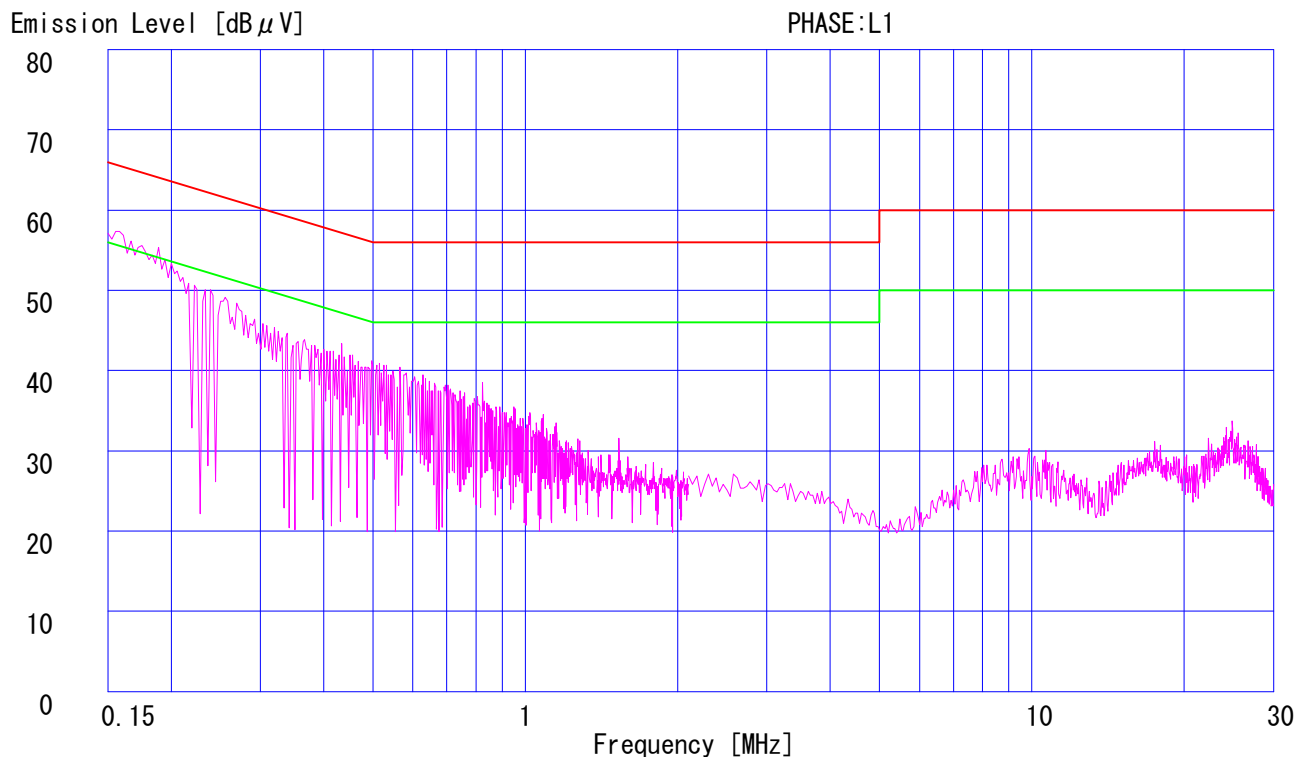
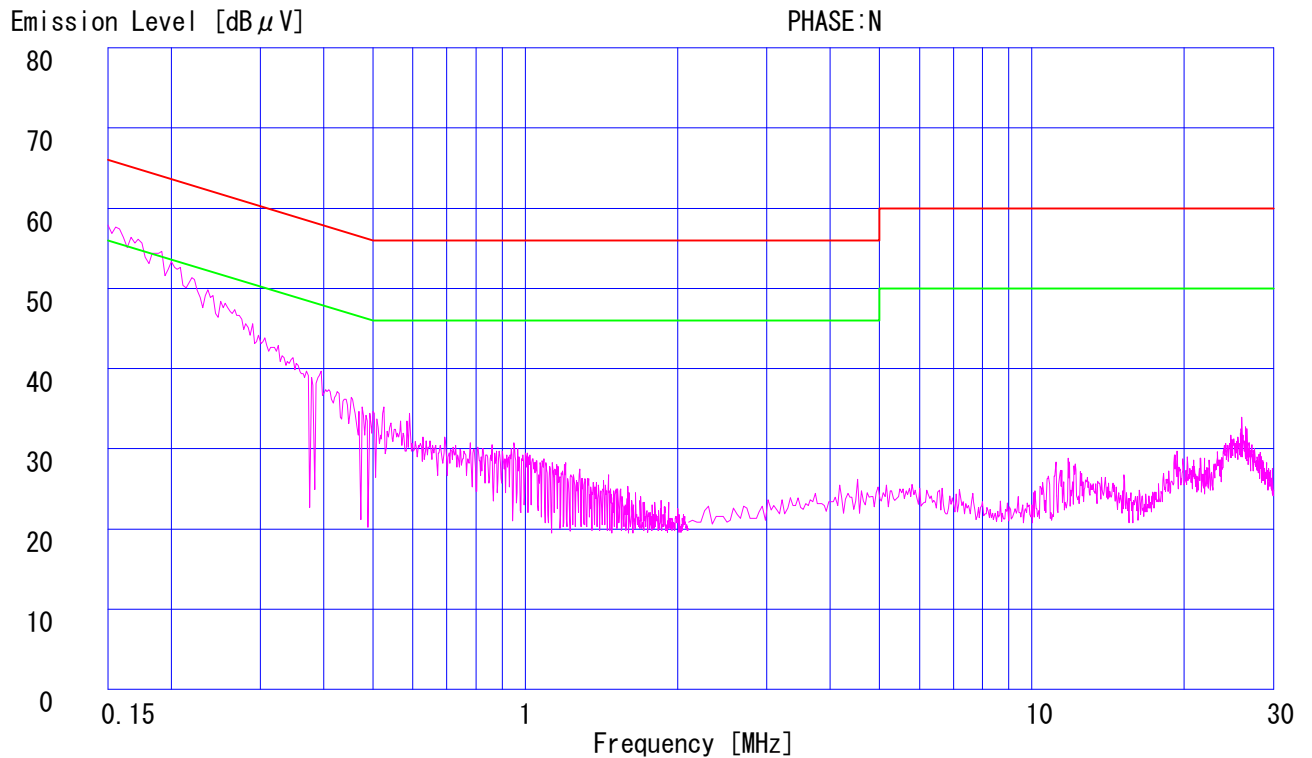
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2480MHz (DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2402MHz (3DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation : FCC Part15C § 15. 207. (CISPR Pub. 22)

Engineer : Makoto Hosaka

No.	FREQ. [MHz]	READING(N)		READING(L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μ V]	AV	QP [dB μ V]	AV				QP [dB]	AV [dB μ V]	QP [dB μ V]	AV [dB μ V]	QP [dB]	AV [dB]
1.	0.1500	47.6	24.8	47.4	24.9	0.1	0.1	0.0	47.8	25.1	66.0	56.0	18.2	30.9
2.	0.1954	42.4	-	42.2	-	0.1	0.1	0.0	42.6	-	63.8	53.8	21.2	-
3.	0.2616	36.1	-	37.6	-	0.1	0.1	0.0	37.8	-	61.4	51.4	23.6	-
4.	0.3265	31.3	-	32.5	-	0.1	0.1	0.0	32.7	-	59.5	49.5	26.8	-
5.	0.5904	25.9	-	30.0	-	0.1	0.1	0.0	30.2	-	56.0	46.0	25.8	-
6.	24.1740	25.8	-	26.2	-	0.7	0.7	0.0	27.6	-	60.0	50.0	32.4	-

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

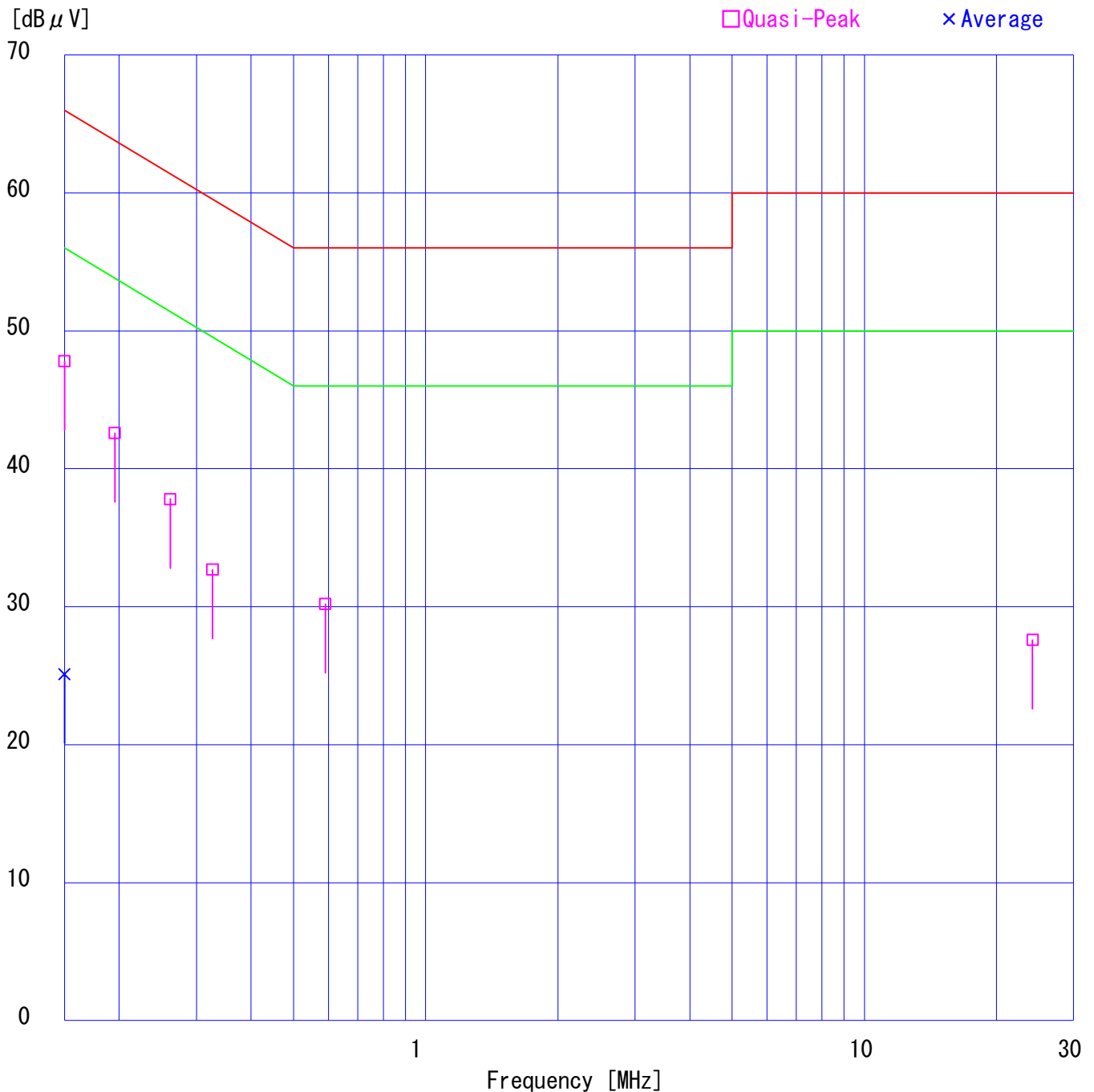
■KLS-02 (NSLK8127) ■COAXIAL CABLE:KCC-33/34
■EMI RECEIVER:KTR-05 (ESC1)

DATA OF CONDUCTION TEST

UL Japan, Inc.
YAMAKITA No.2 SHIELD ROOM
Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co., Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2402MHz (3DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation : FCC Part15C § 15. 207. (CISPR Pub. 22)

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST CHART

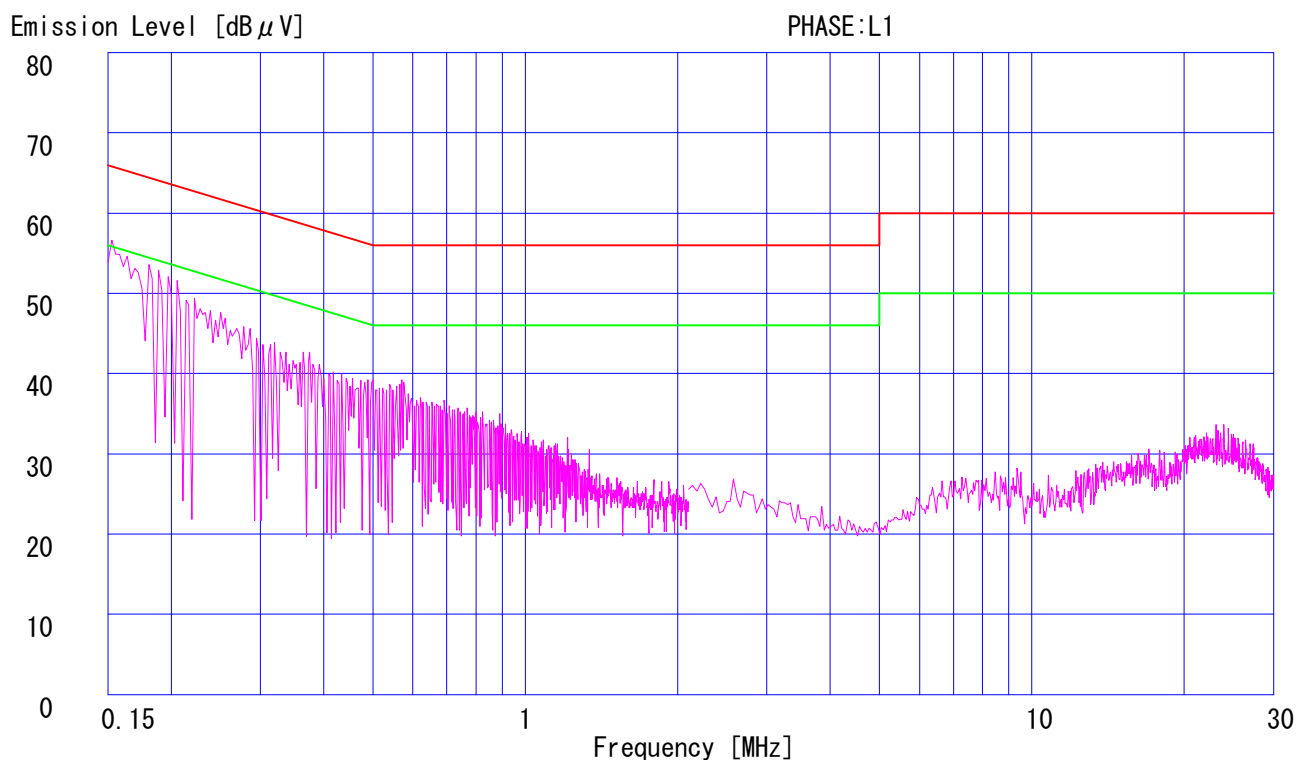
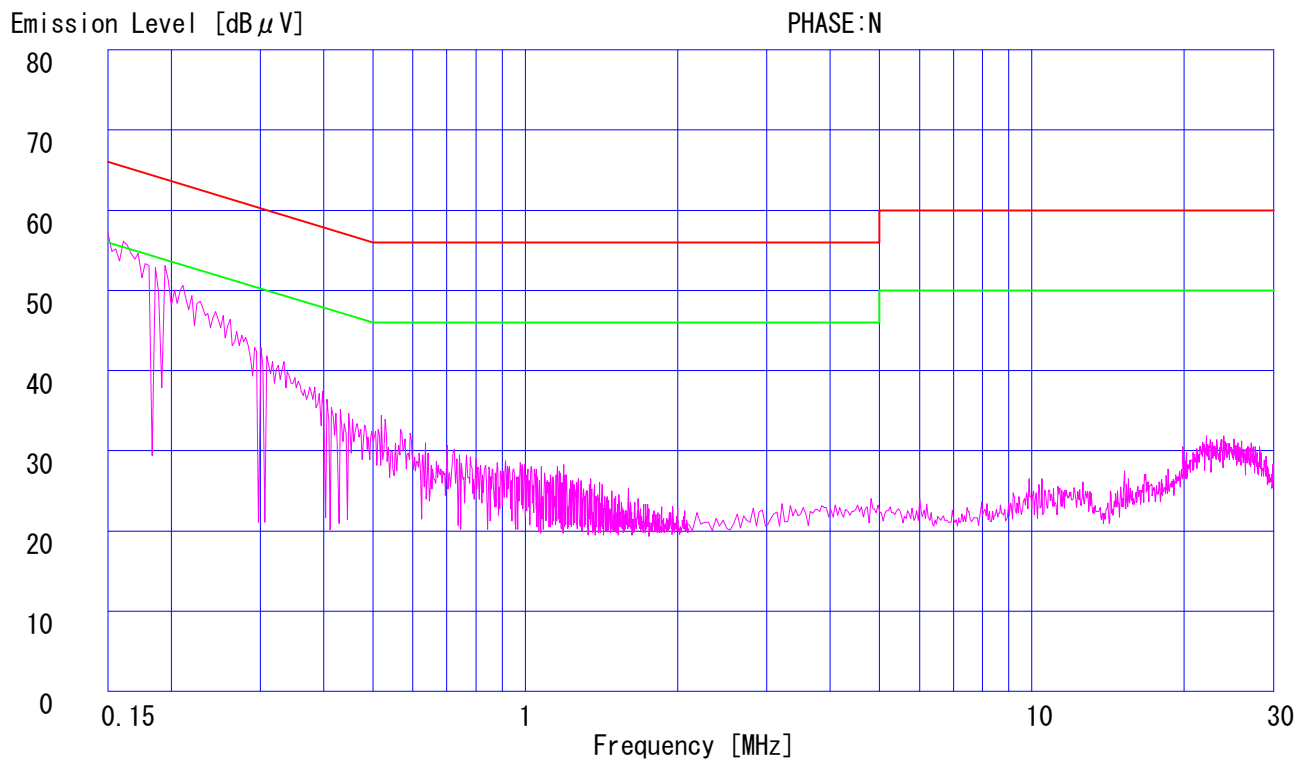
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2402MHz (3DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST CHART

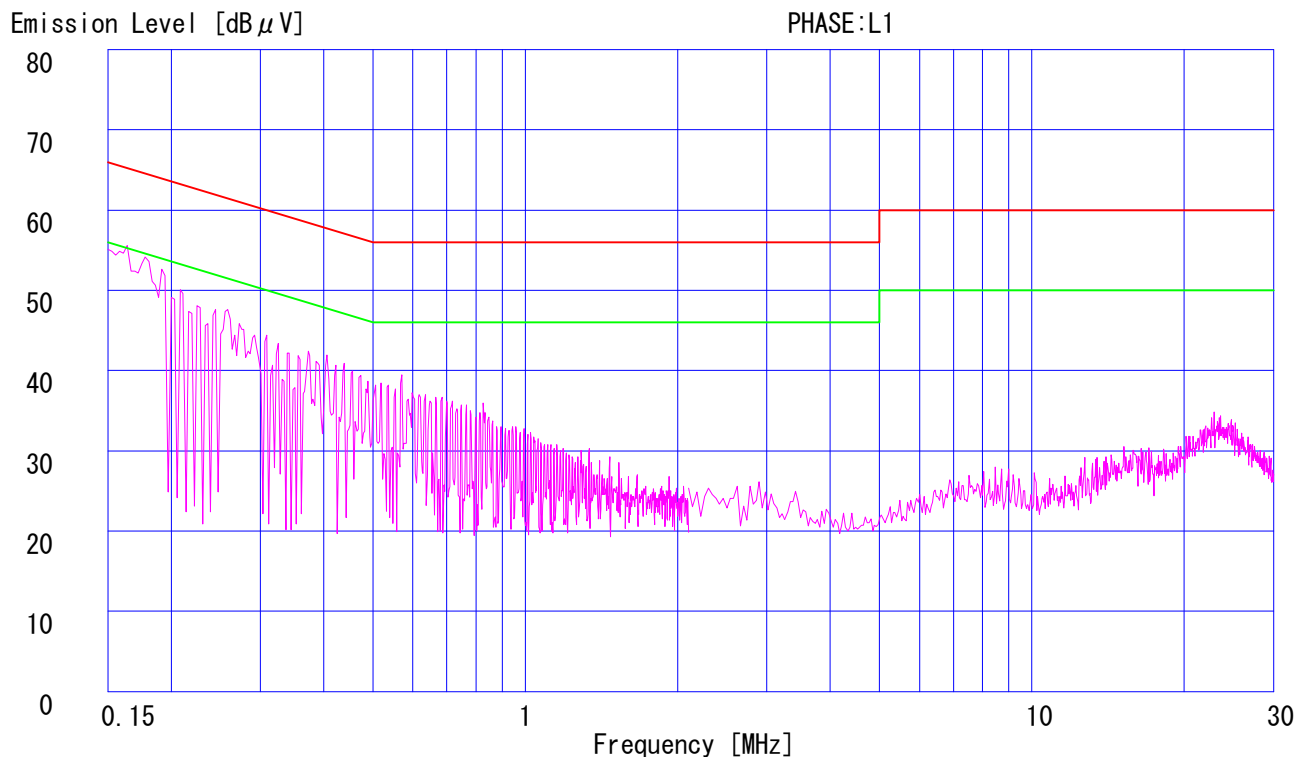
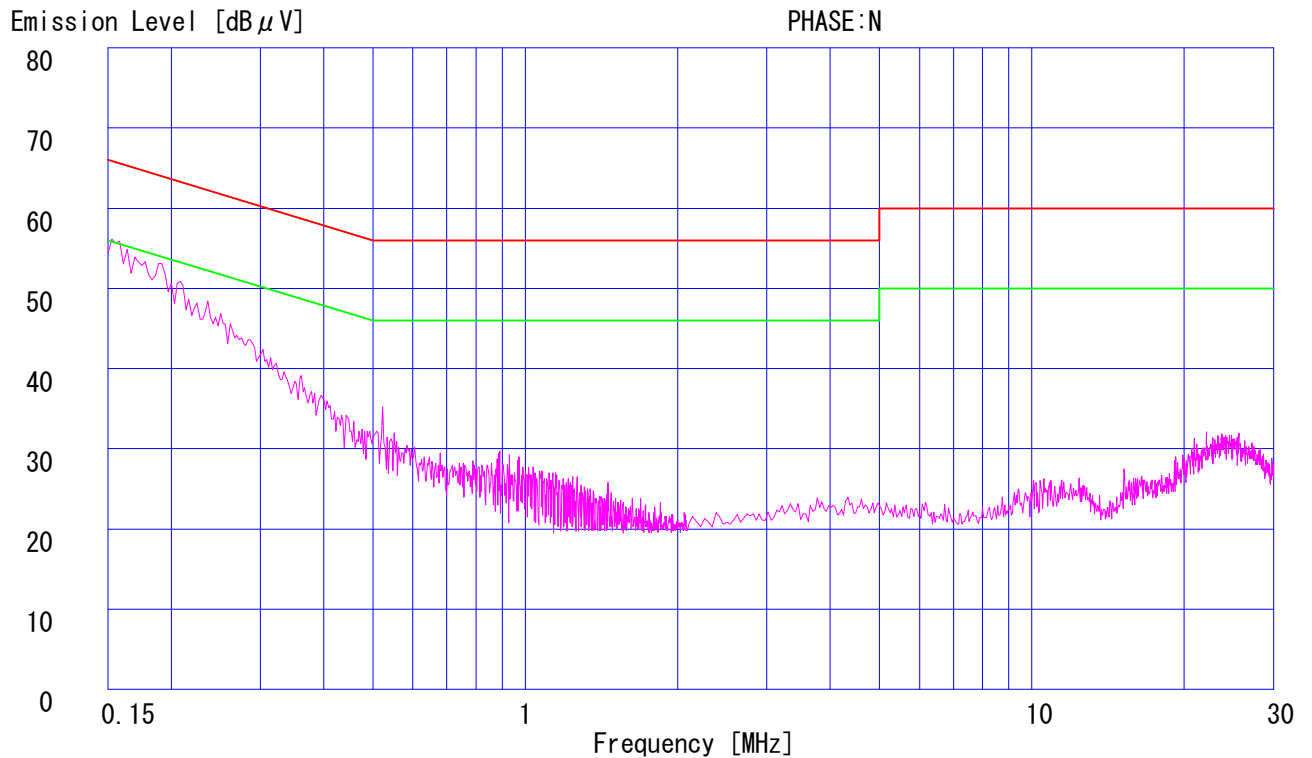
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2441MHz (3DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation 1 : FCC Part15C § 15. 207. (CISPR Pub. 22)
Regulation 2 : None

Engineer : Makoto Hosaka



DATA OF CONDUCTION TEST CHART

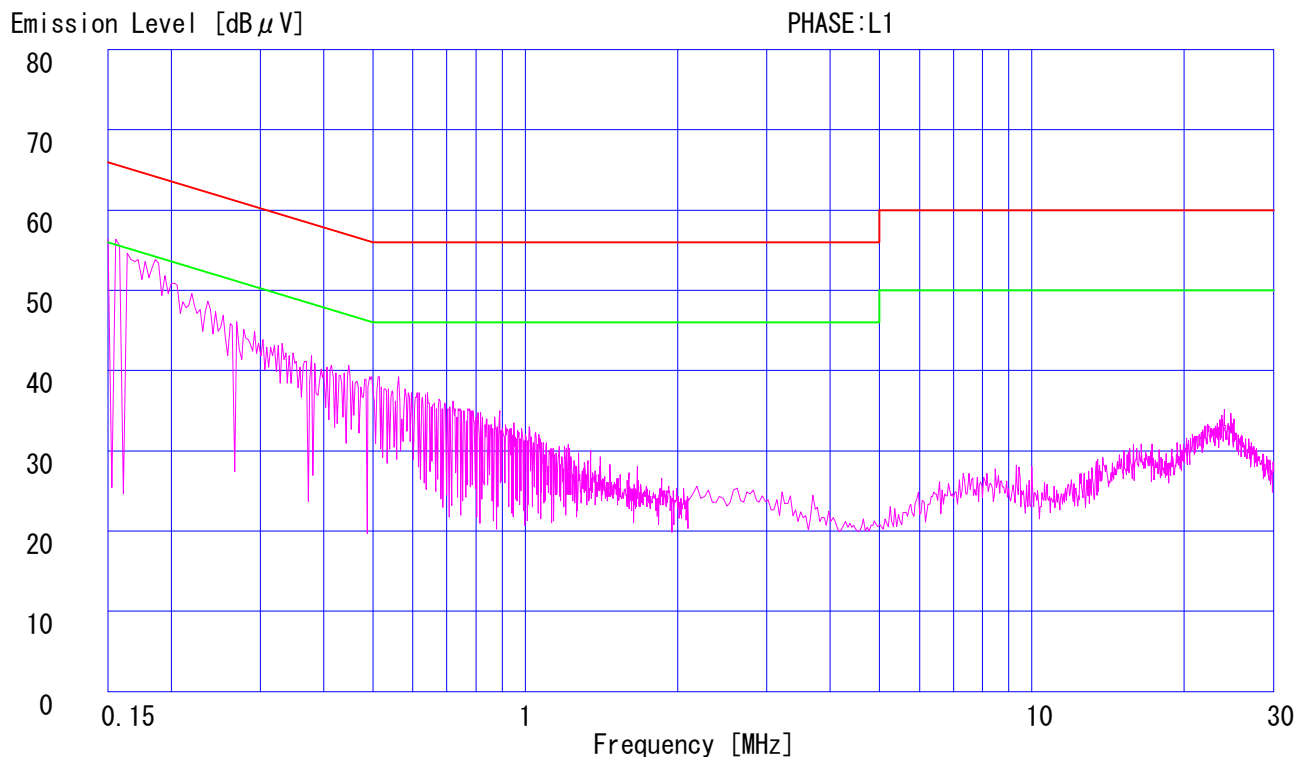
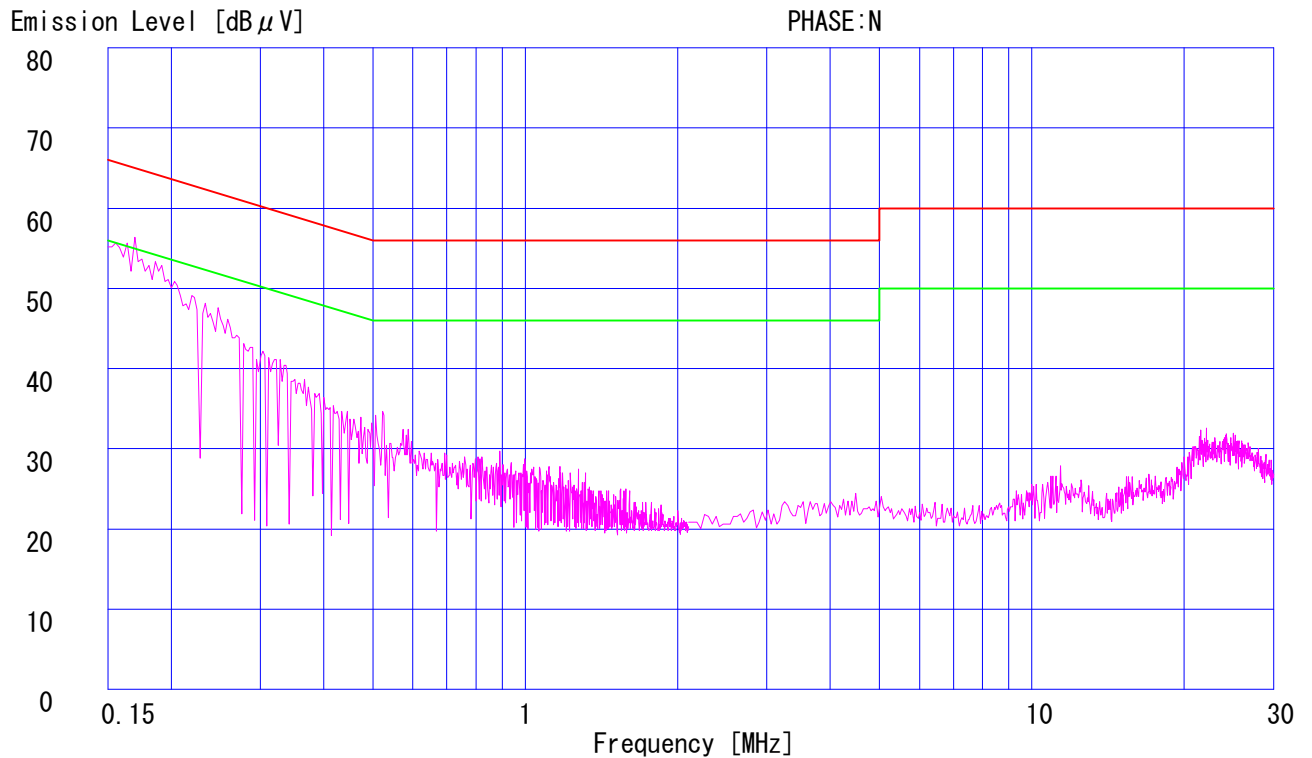
UL Japan, Inc.

YAMAKITA No.2 SHIELD ROOM

Report No. : 28DE0007-YK-01-A

Applicant : Alps Electric Co.,Ltd.
Kind of Equipment : Bluetooth Transceiver Module
Model No. : UGPZ6-C3
Serial No. : 0002c752d0e9
Power : AC120V/60Hz
Mode : Tx:2480MHz (3DH5)
Remarks : -
Date : 11/8/2007
Phase : Single Phase
Temperature : 25 °C
Humidity : 49 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub.22)
Regulation 2 : None

Engineer : Makoto Hosaka



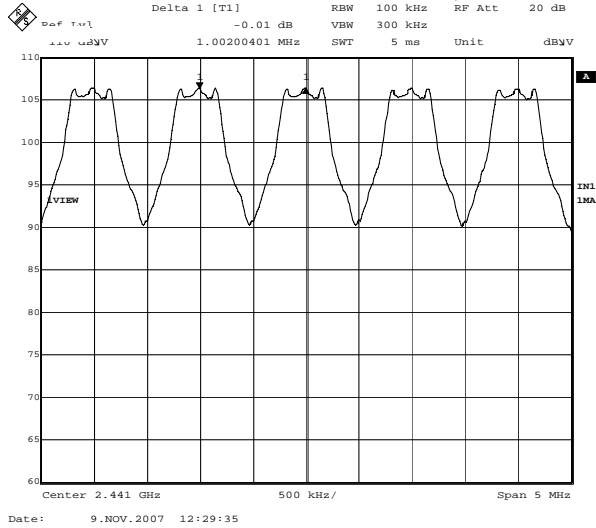
Channel Separation: FCC 15.247(a)(1)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

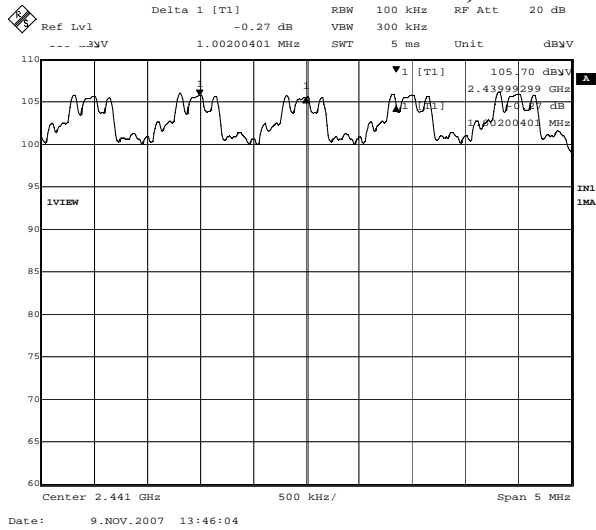
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Limit: $\geq 25\text{kHz}$ or $2/3 * 20\text{dB Bandwidth (Power : No greater than 125mW)}$

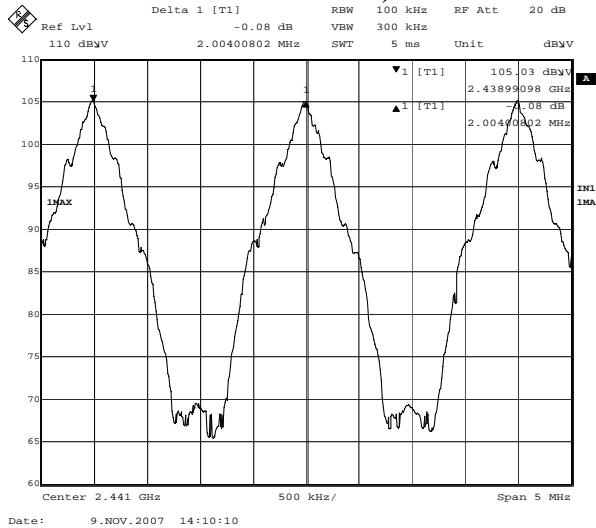
1. Hopping, DH5: 1.002MHz ($2/3 * 20\text{dB Bandwidth: } 2/3 * 1.148\text{MHz} = 765.3\text{kHz}$)



2. Hopping, 3DH5: 1.002MHz ($2/3 * 20\text{dB Bandwidth: } 2/3 * 1.413\text{MHz} = 942.0\text{kHz}$)



3. Inquiry: 2.004MHz ($2/3 * 20\text{dB Bandwidth: } 2/3 * 1.130\text{MHz} = 753.3\text{kHz}$)



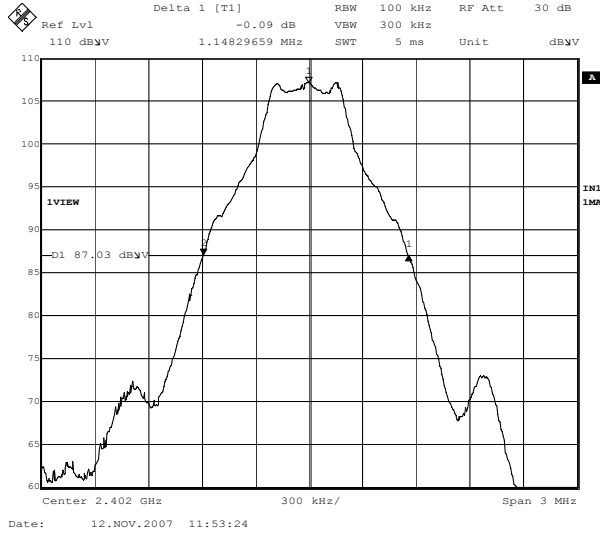
20dB Bandwidth: FCC 15.247(a)(1)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

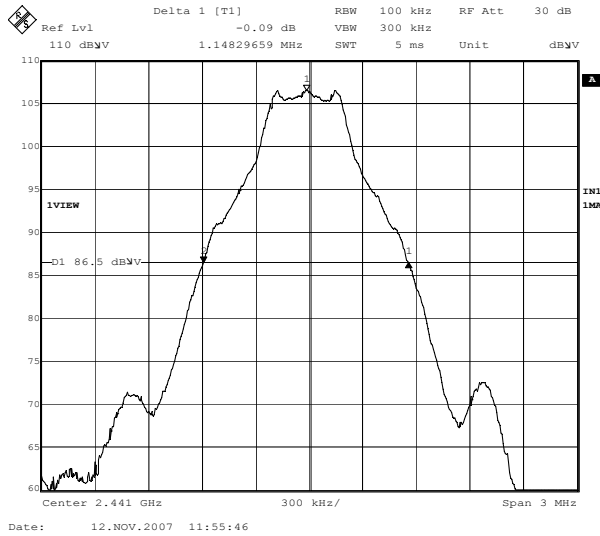
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)
DATE : 2007.11.12
TEMP./HUMI : 22deg.C./48%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[Hopping off, DH5]

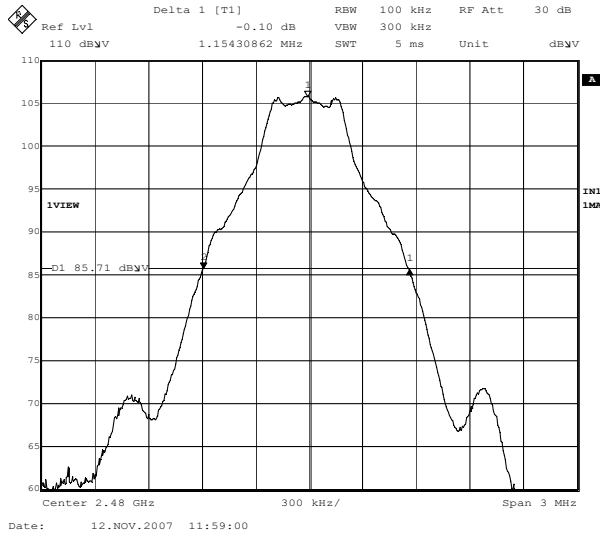
1. ch : 2402MHz/20dB Bandwidth:1.148MHz



2. ch : 2441MHz/20dB Bandwidth:1.148MHz



3. ch : 2480MHz/20dB Bandwidth:1.154MHz



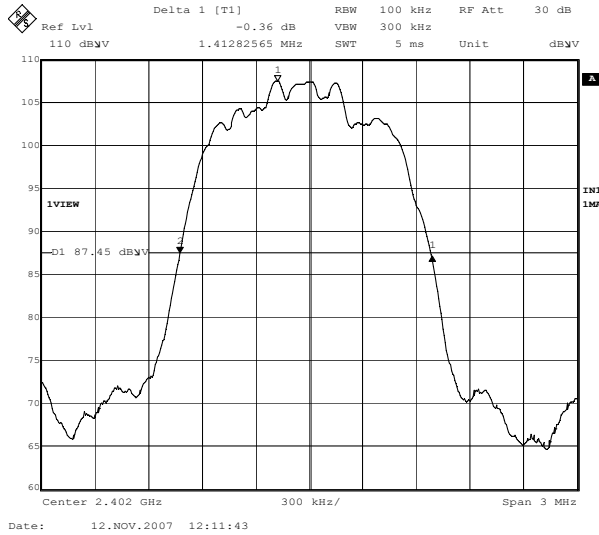
20dB Bandwidth: FCC 15.247(a)(1)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

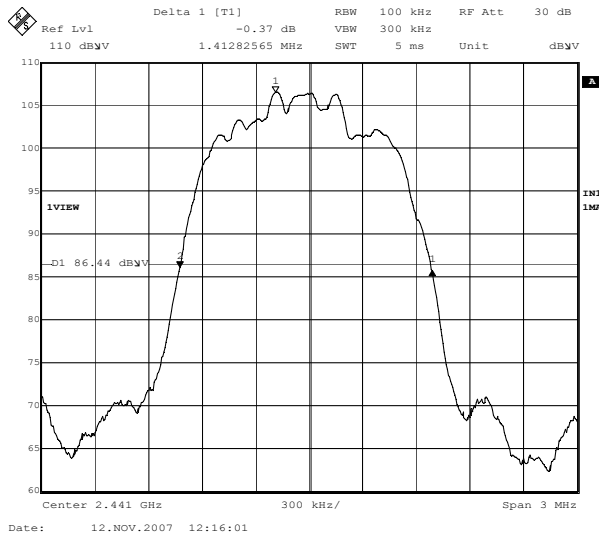
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)
DATE : 2007.11.12
TEMP./HUMI : 22deg.C./48%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[Hopping off, 3DH5]

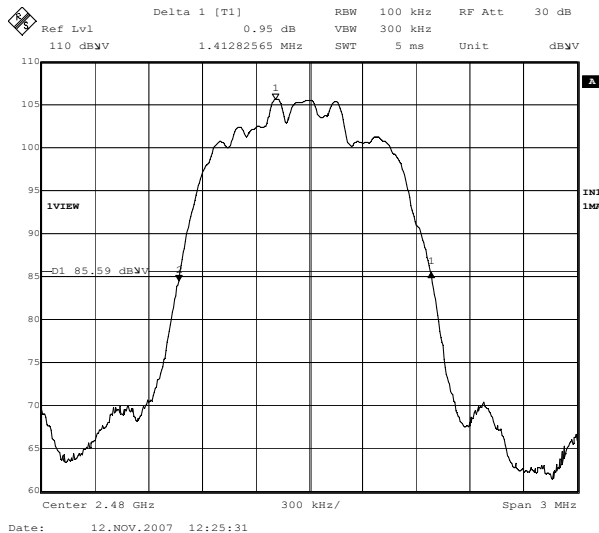
4. ch : 2402MHz/20dB Bandwidth:1.413MHz



5. ch : 2441MHz/20dB Bandwidth:1.413MHz



6. ch : 2480MHz/20dB Bandwidth:1.413MHz



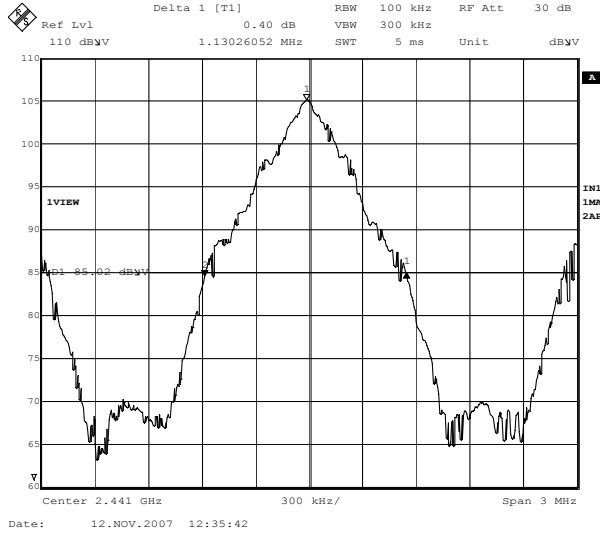
20dB Bandwidth: FCC 15.247(a)(1)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)
DATE : 2007.11.12
TEMP./HUMI : 22deg.C./48%
TEST MODE : Transmitting
ENGINEER : Toyokazu Imamura

[Inquiry]

7. Inaury/20dB Bandwidth:1.130MHz



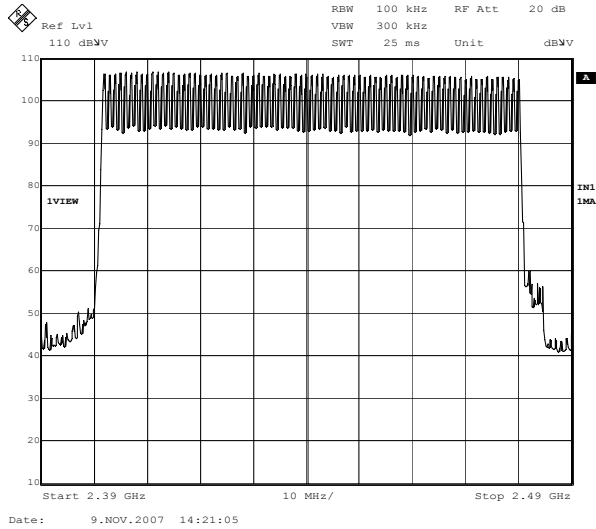
Channel Utilization: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

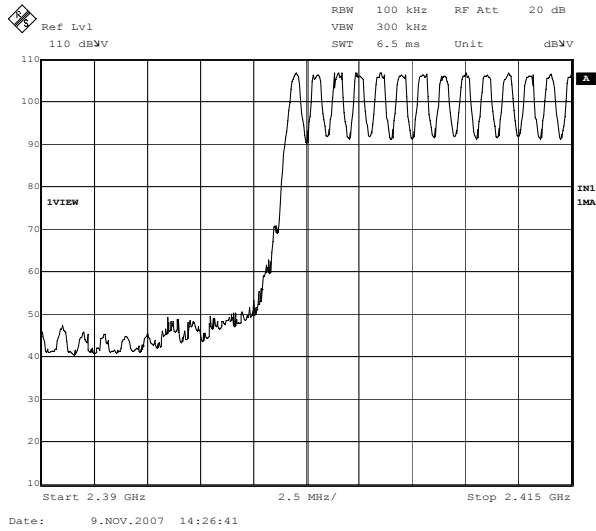
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Hopping, DH5: 79ch

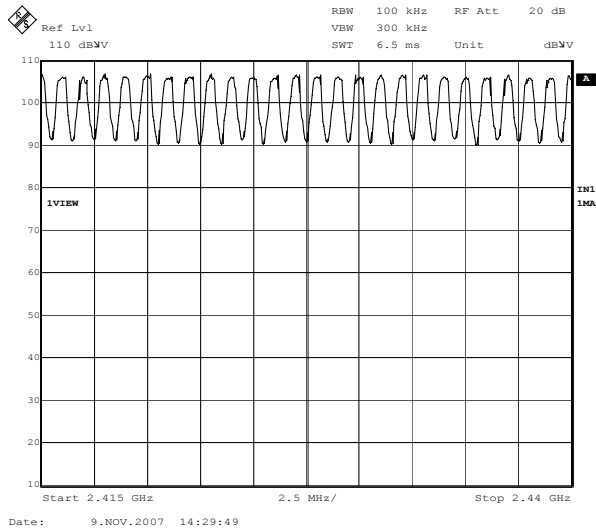
1.



2.



3.

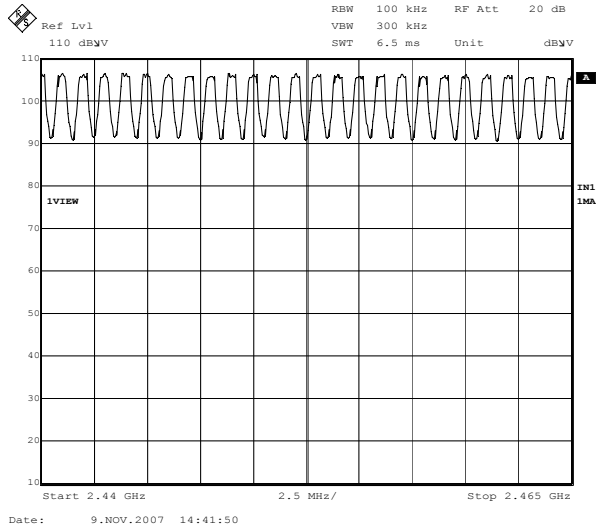


Channel Utilization: FCC 15.247(a)(1)(iii)

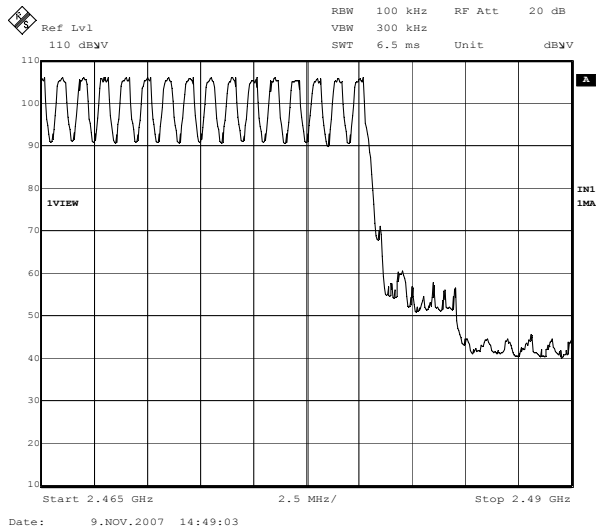
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

4.



5.



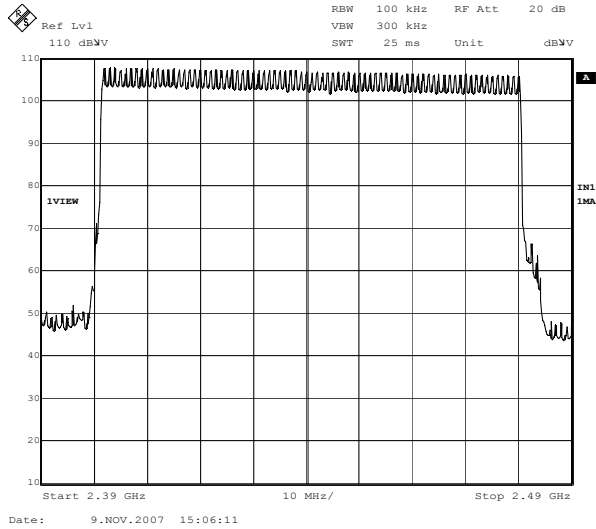
Channel Utilization: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

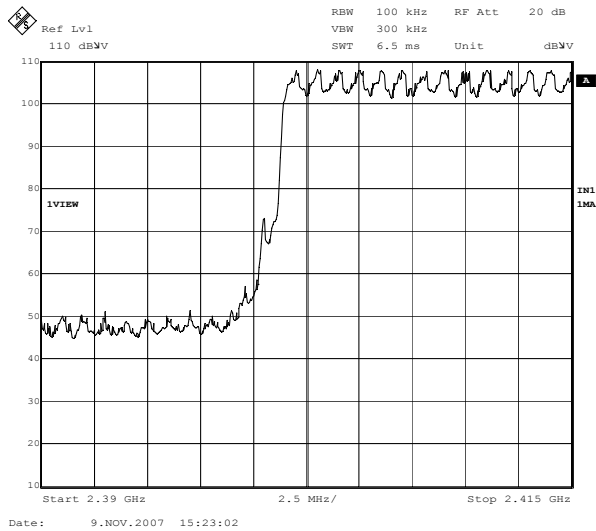
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Hopping, 3DH5: 79ch

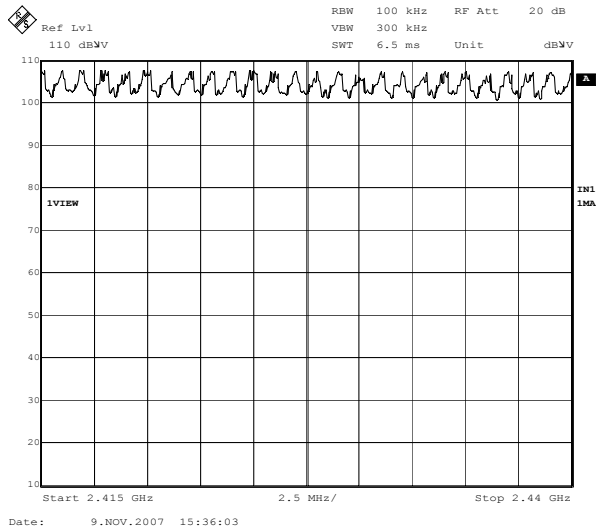
1.



2.



3.

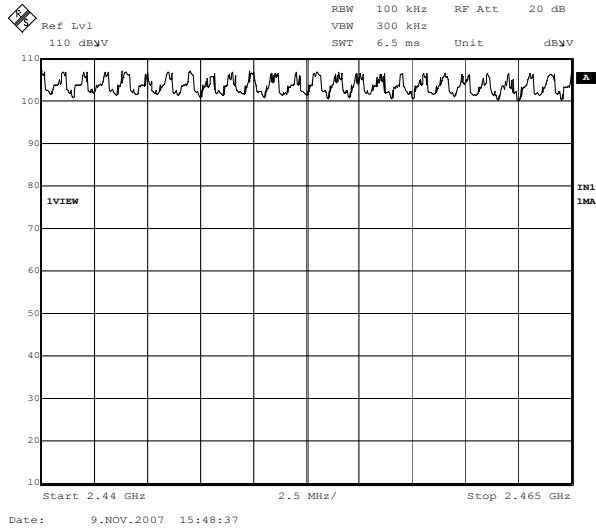


Channel Utilization: FCC 15.247(a)(1)(iii)

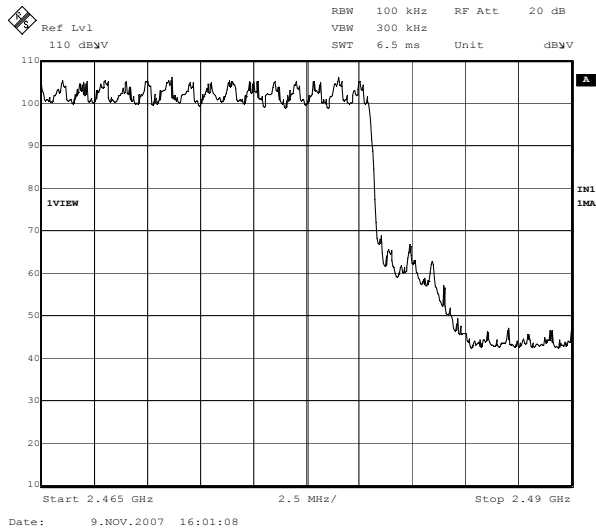
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

4.



5.

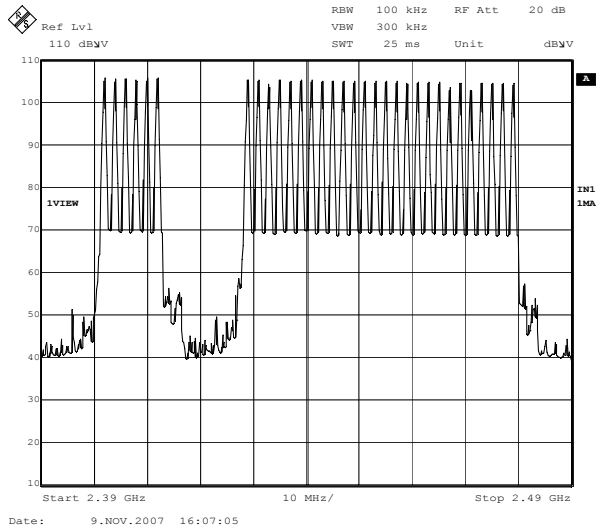


Channel Utilization: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

1. Inquiry: 32ch



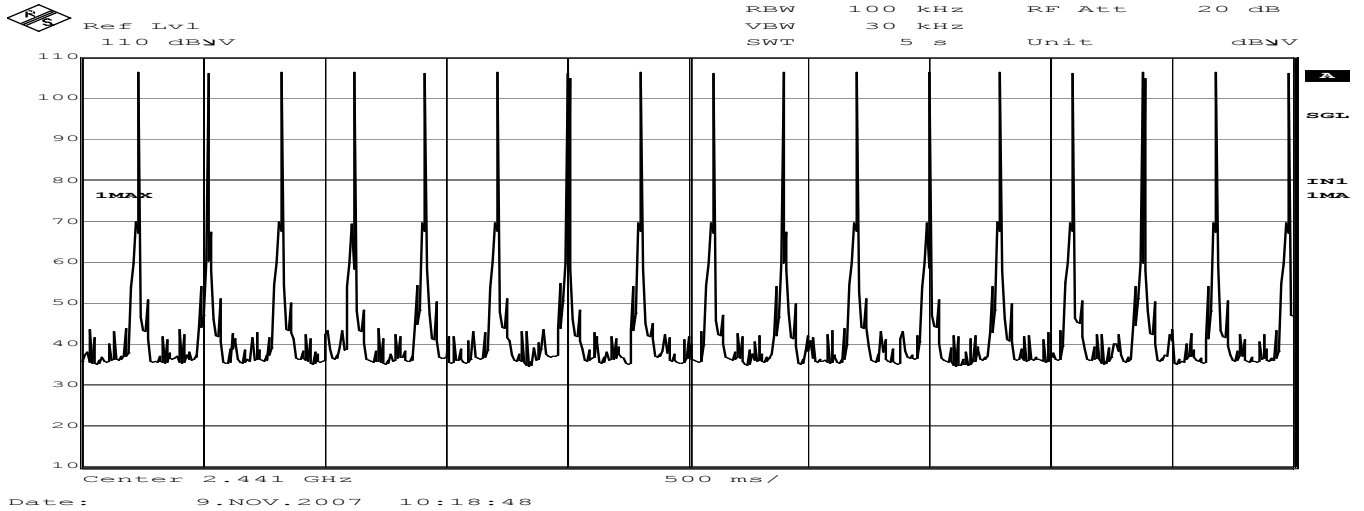
Dwell Time: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

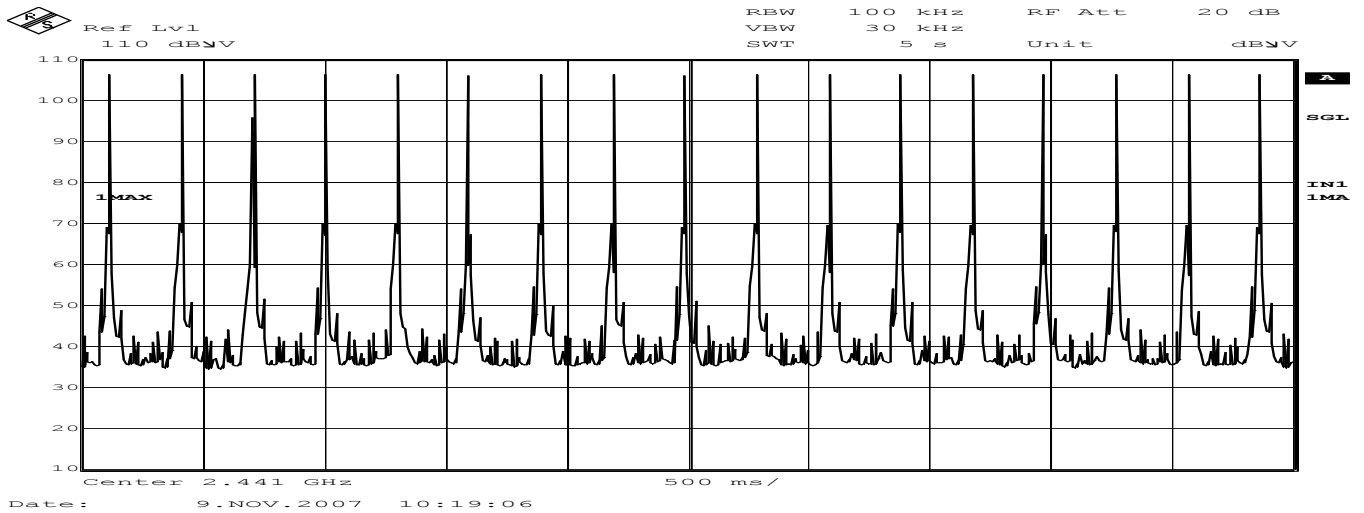
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Hopping (DH1):

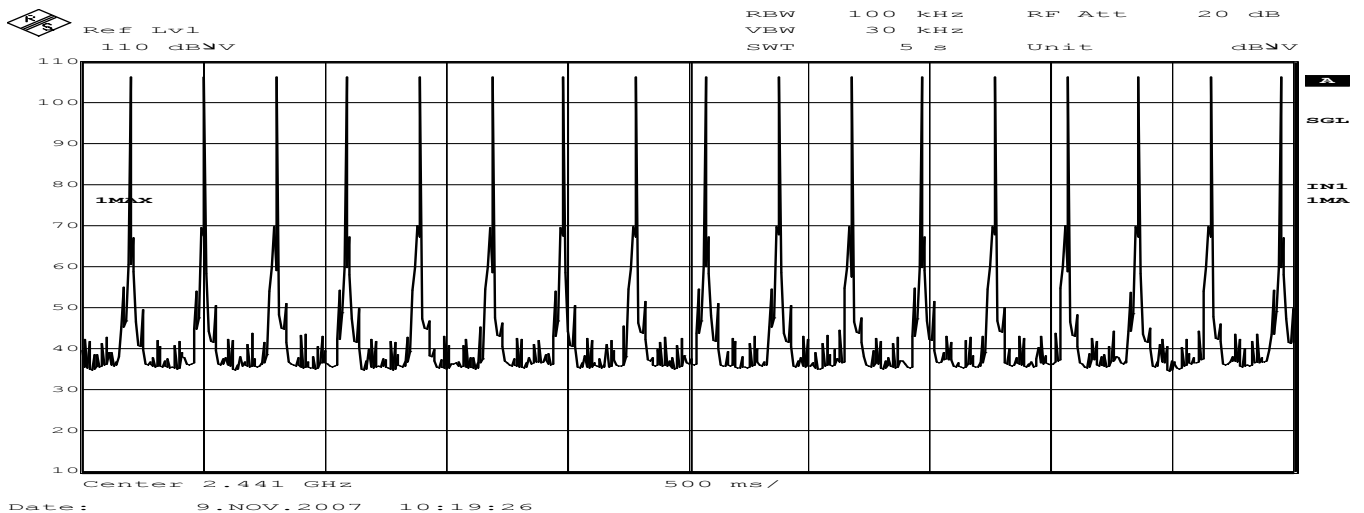
Count 1



Count 2



Count 3

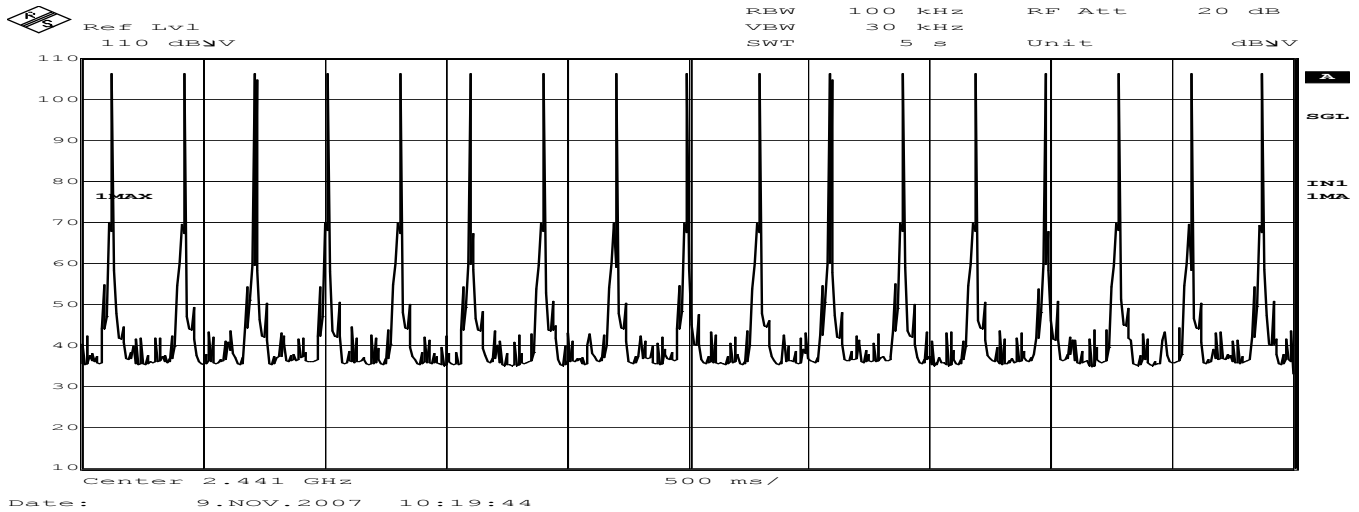


Dwell Time: FCC 15.247(a)(1)(iii)

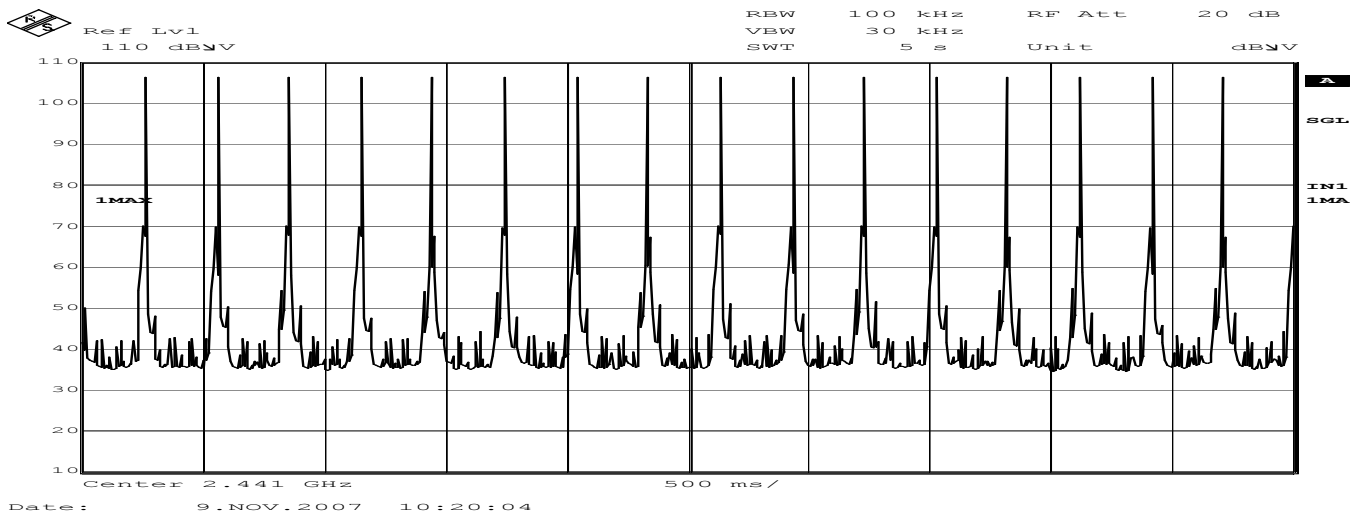
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

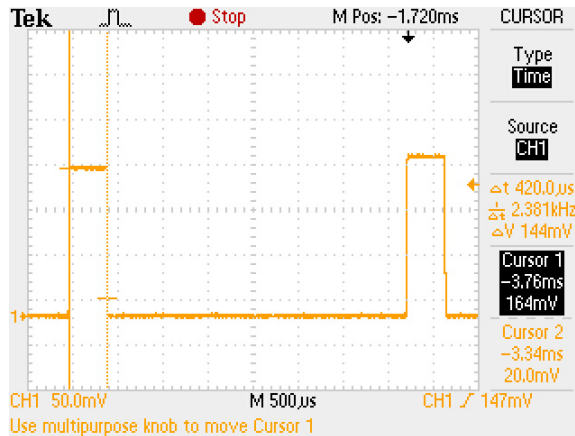
Count 4



Count 5



Duty cycle(Hopping DH1)



Average times of rising in 30 sec. of sweep = (17 + 17 + 17 + 17 + 16) / 5 = 16.8

Average times of rising in 1 sec. = 16.8 / 5s = 3.36

Average times of rising in 0.4x = 0.4 * 79ch * 3.36 = 106.17

Dwell time = 106.17 * 0.420 = 44.59 [ms]

Limit : Dwell Time < 0.4[s]

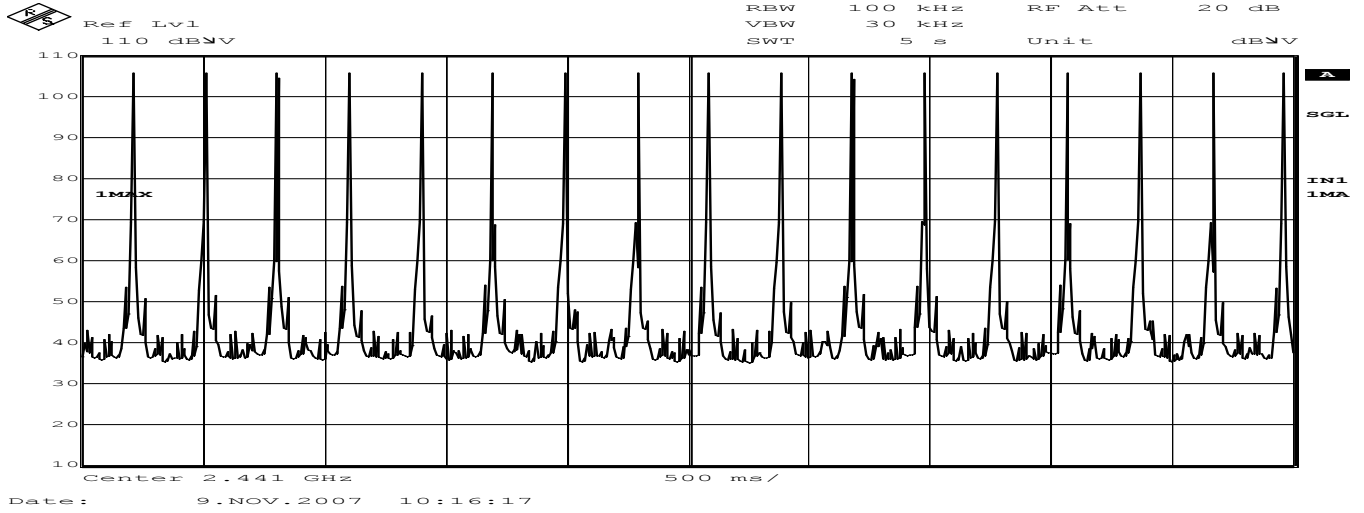
Dwell Time: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

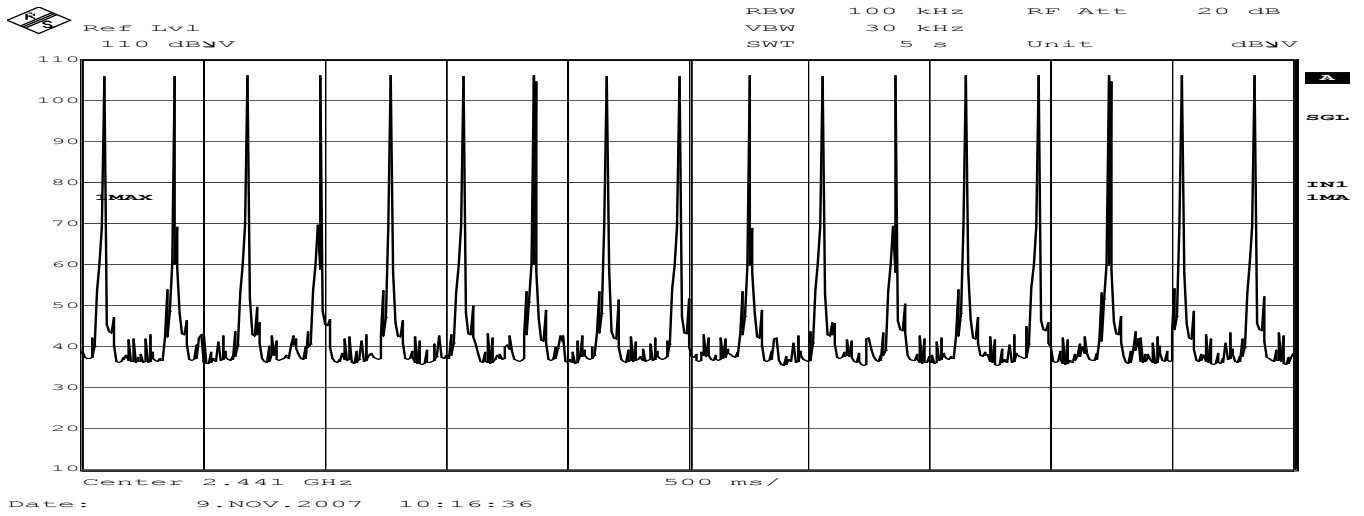
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Hopping (DH3):

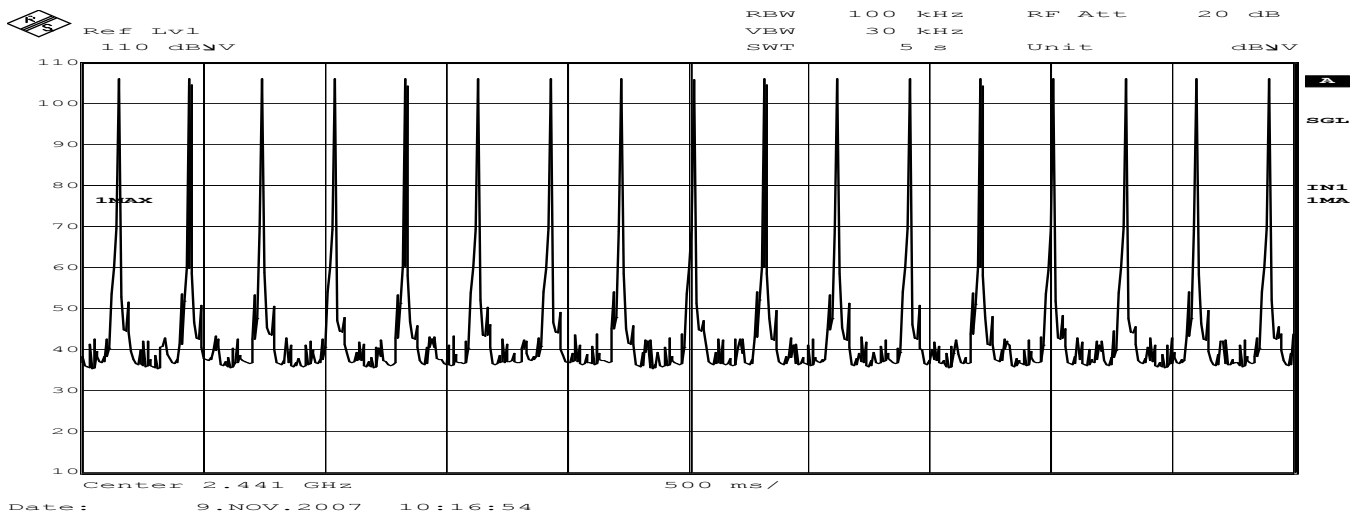
Count 1



Count 2



Count 3

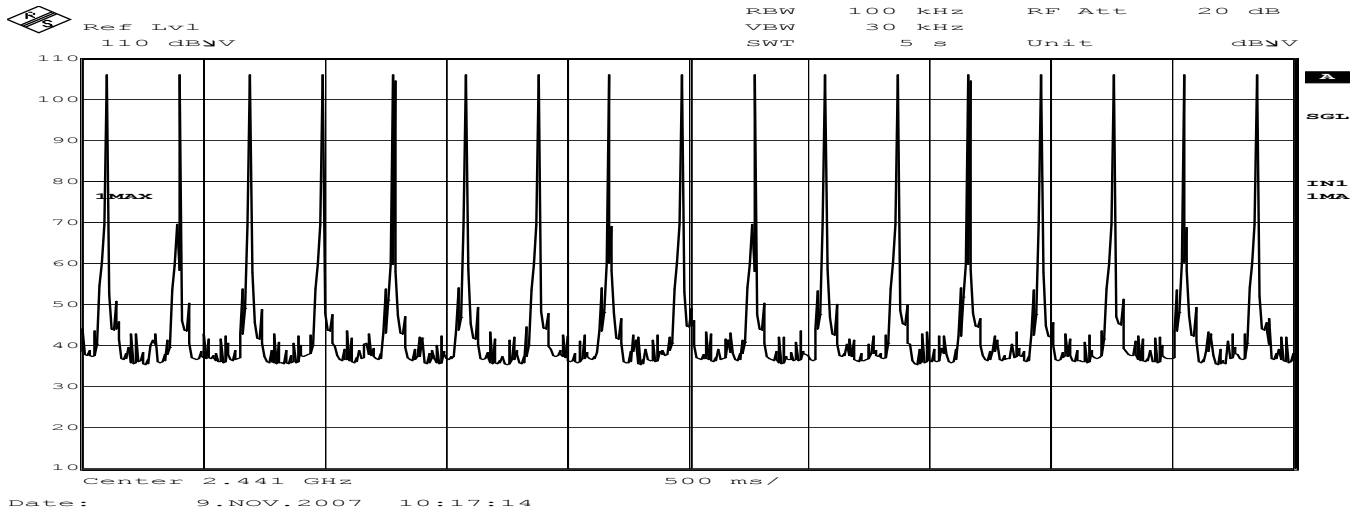


Dwell Time: FCC 15.247(a)(1)(iii)

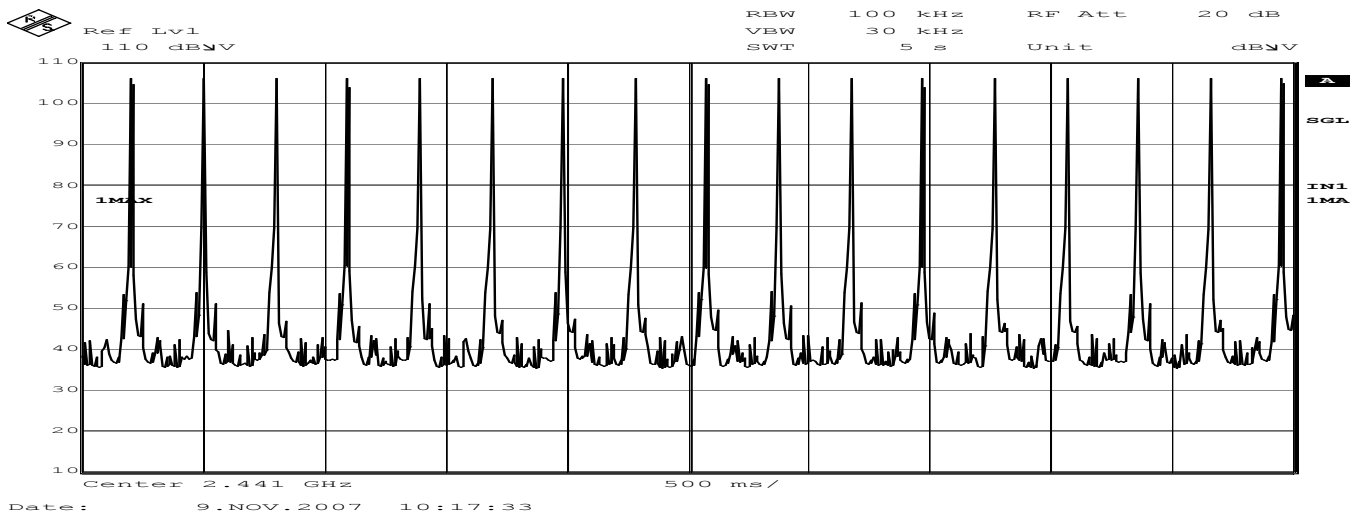
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

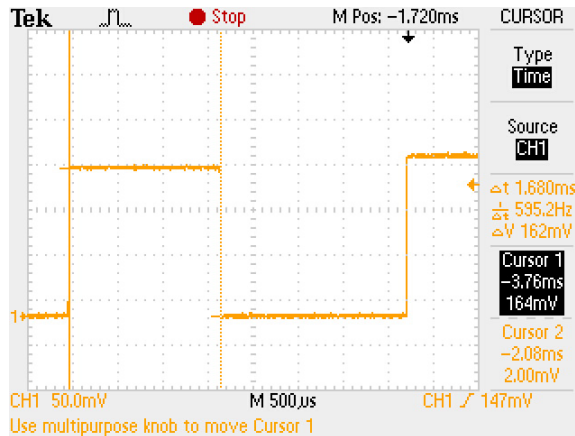
Count 4



Count 5



Duty cycle(Hopping DH3)



Average times of rising in 30 sec. of sweep = $(17 + 17 + 17 + 17 + 17) / 5 = 17$

Average times of rising in 1 sec. = $17 / 5s = 3.4$

Average times of rising in 0.4x = $0.4 * 79ch * 3.4 = 107.44$

Dwell time = $107.44 * 1.68 = 180.50$ [ms]

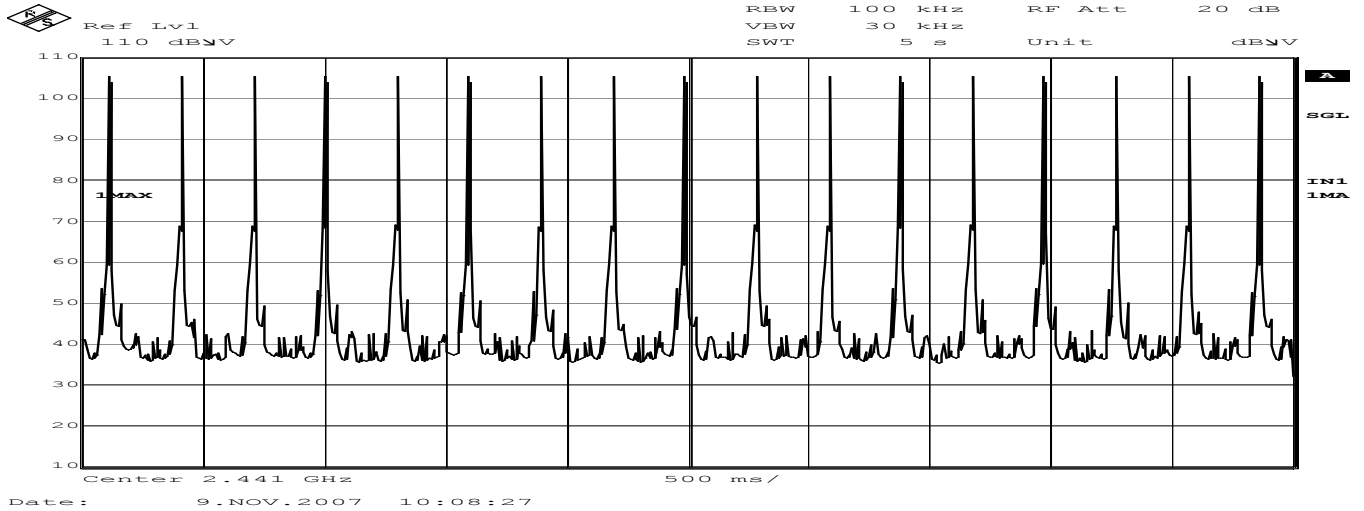
Limit : Dwell Time < 0.4[s]

Dwell Time: FCC 15.247(a)(1)(iii)

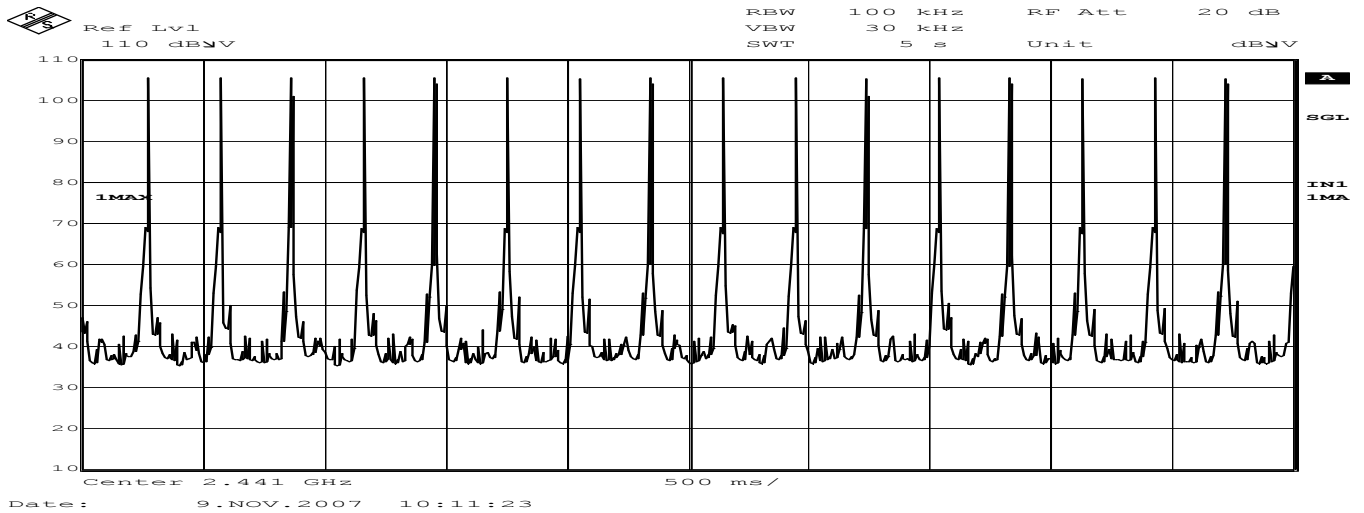
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

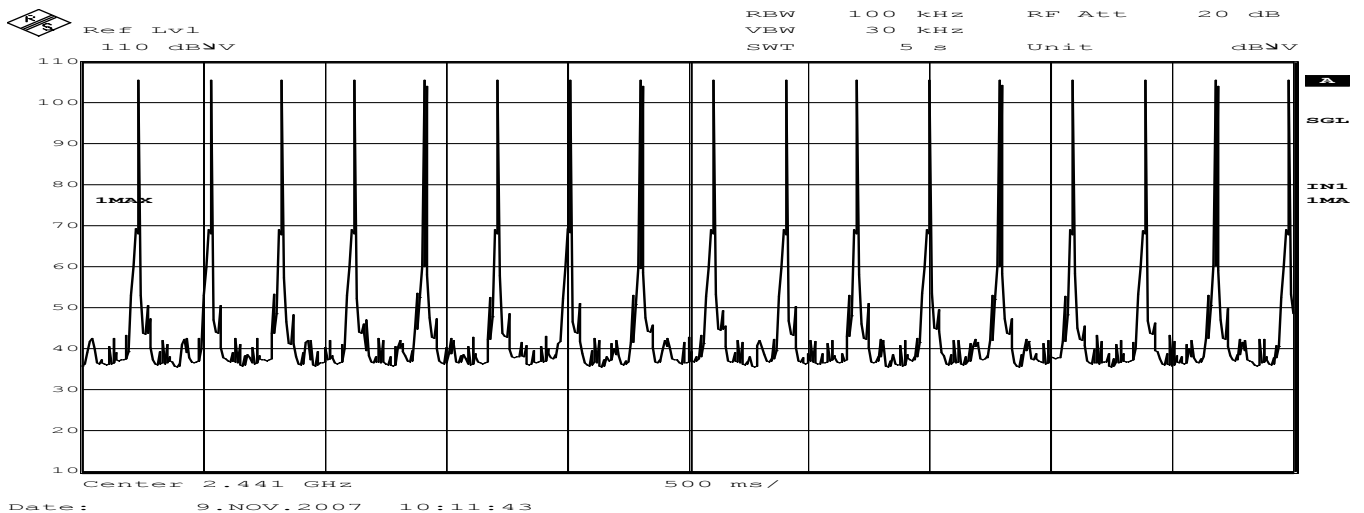
Hopping (DH5):
Count 1



Count 2



Count 3

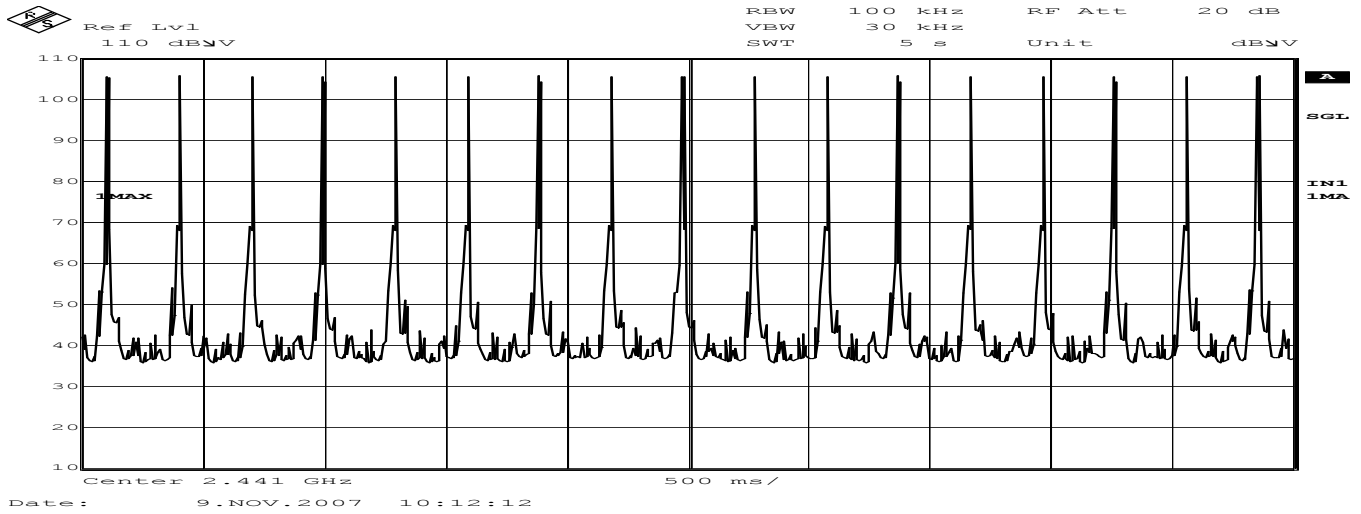


Dwell Time: FCC 15.247(a)(1)(iii)

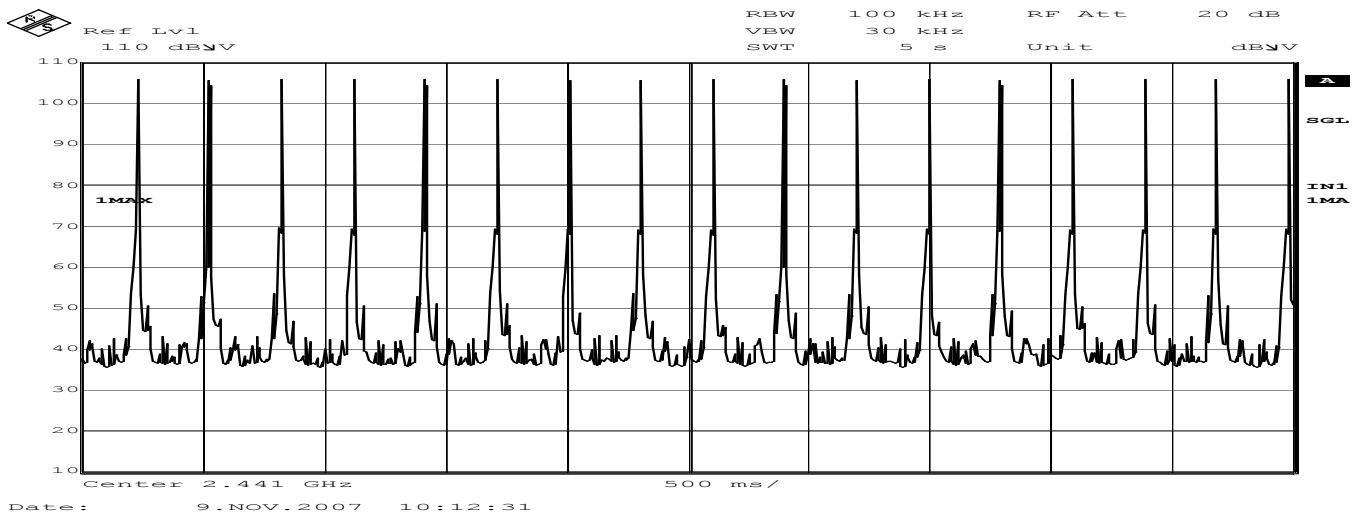
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

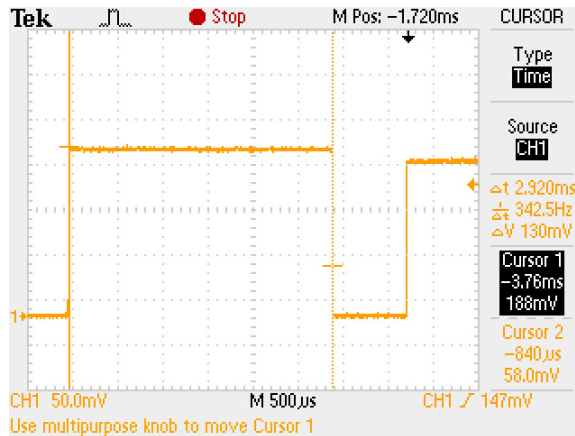
Count 4



Count 5



Duty cycle(Hopping DH5)



Average times of rising in 30 sec. of sweep = (17 + 16 + 17 + 17 + 17) / 5 = 16.8

Average times of rising in 1 sec. = 16.8 / 5s = 3.36

Average times of rising in 0.4x = 0.4 * 79ch * 3.36 = 106.18

Dwell time = 106.18 * 2.92 = 310.05 [ms]

Limit : Dwell Time < 0.4[s]

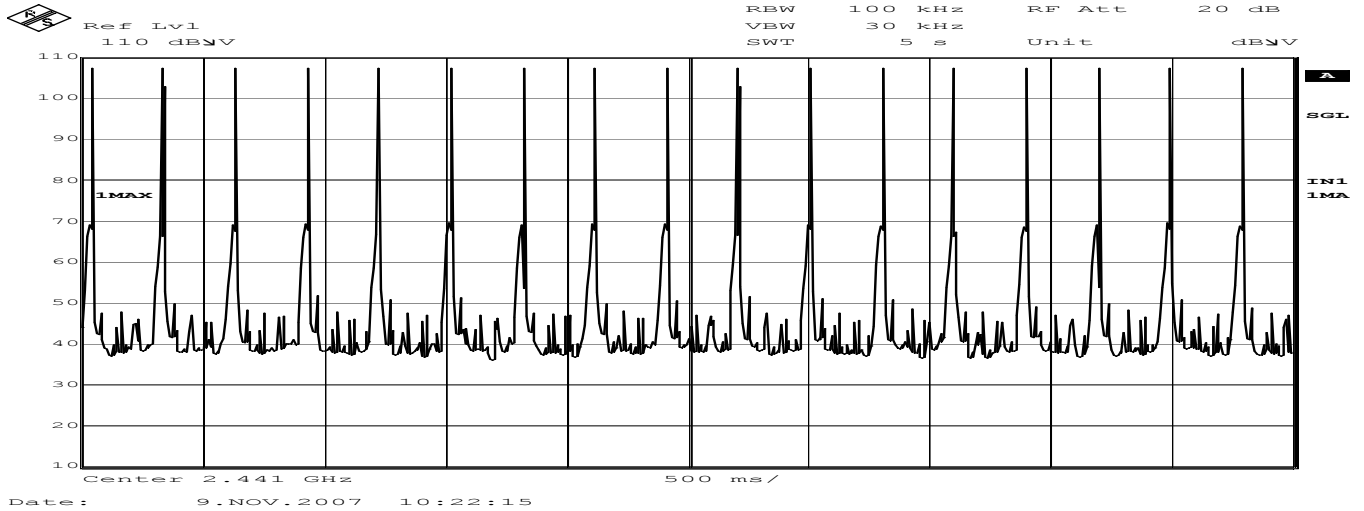
Dwell Time: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

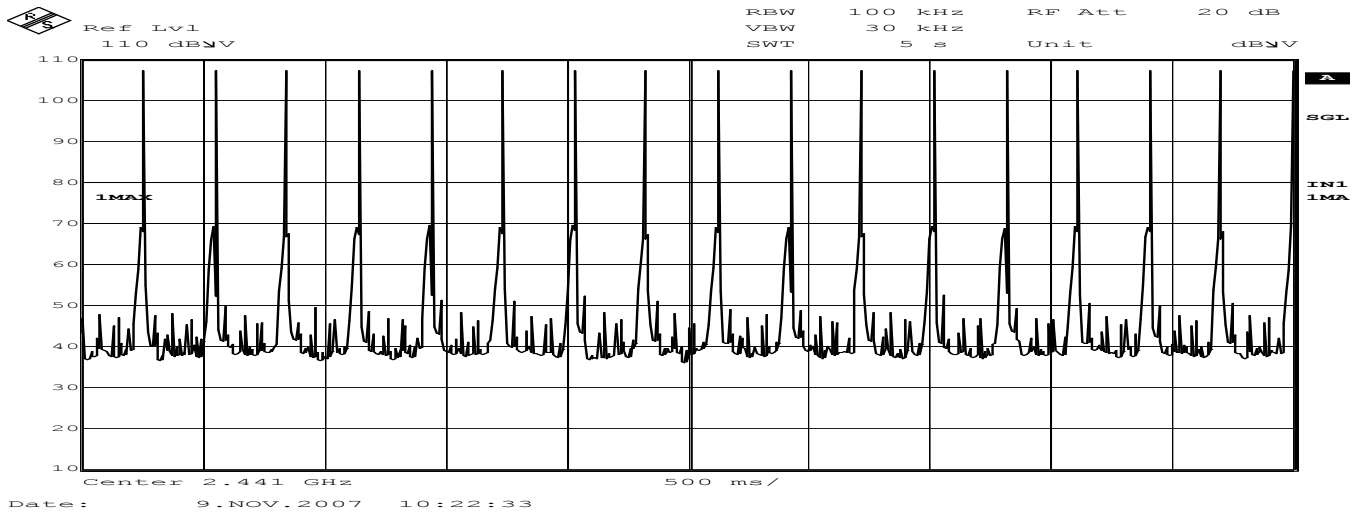
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Hopping (3DH1):

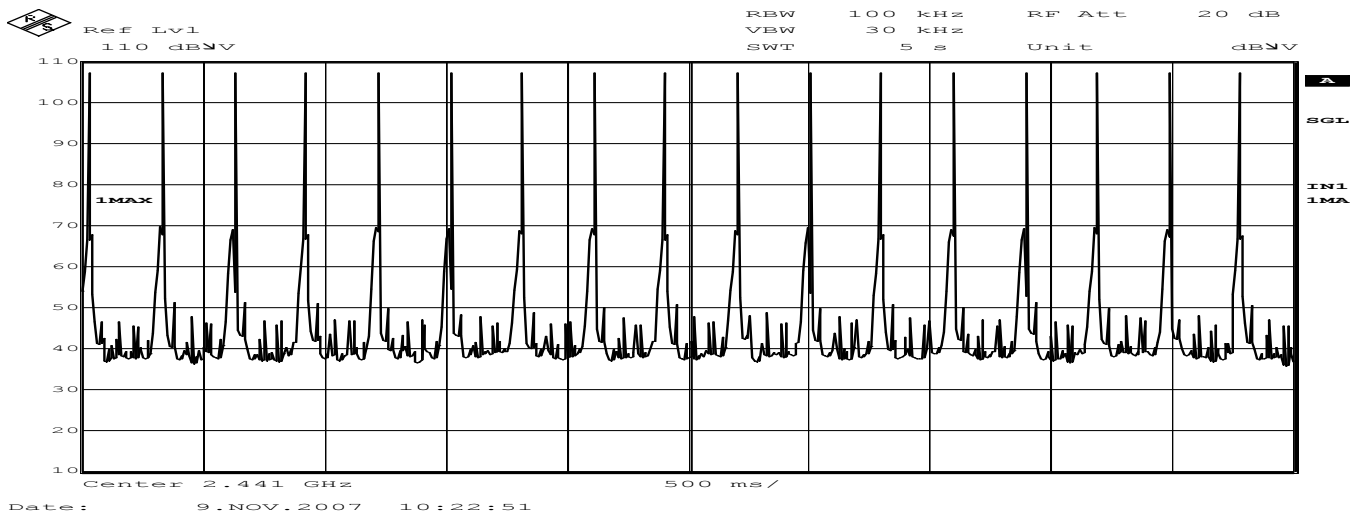
Count 1



Count 2



Count 3

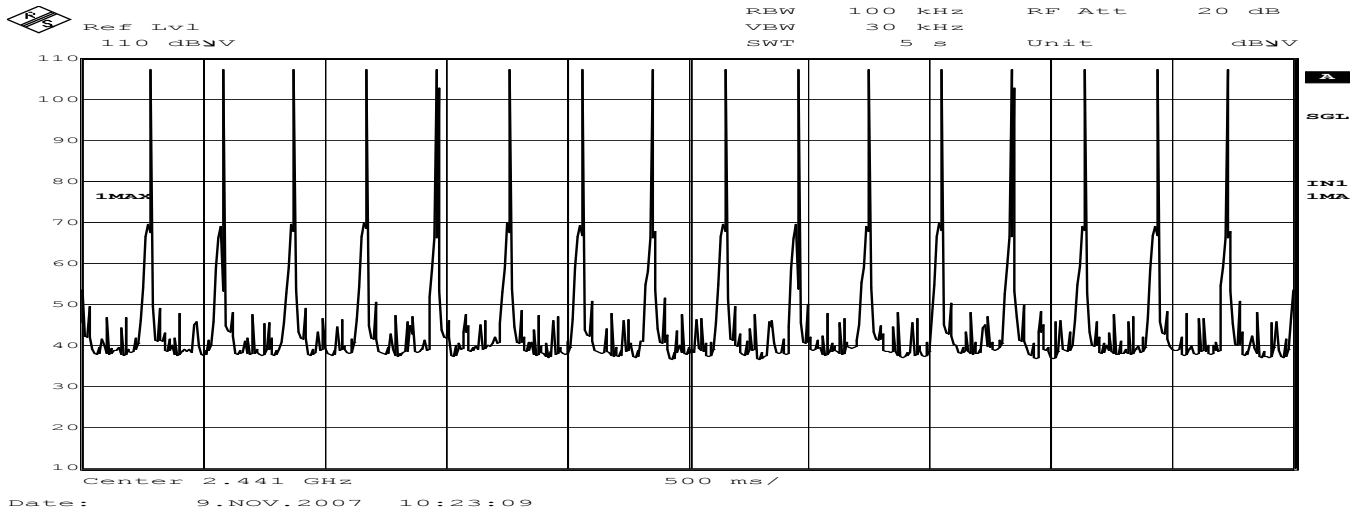


Dwell Time: FCC 15.247(a)(1)(iii)

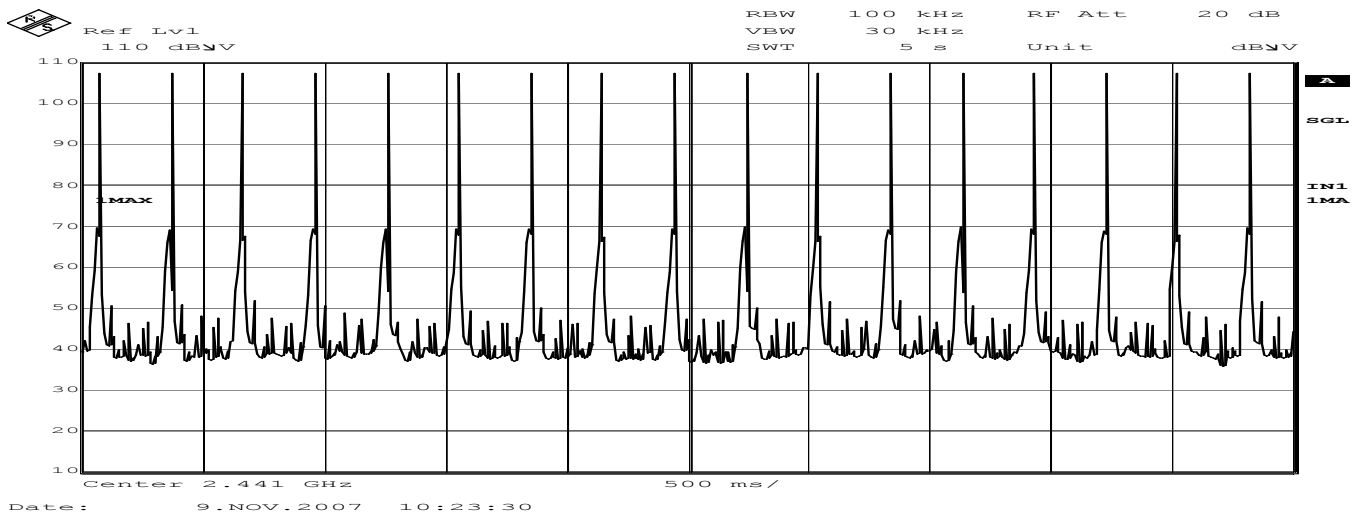
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

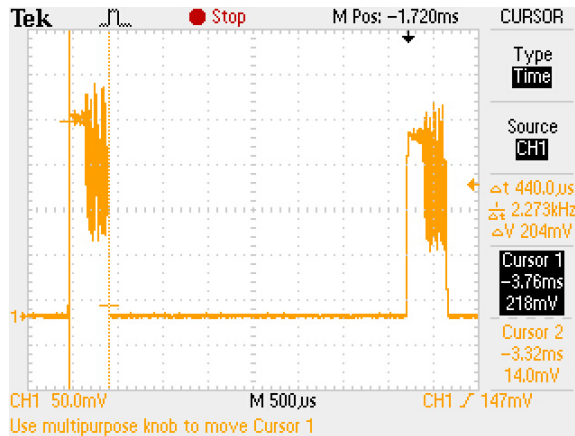
Count 4



Count 5



Duty cycle(Hopping 3DH1)



Average times of rising in 30 sec. of sweep = (17 + 17 + 17 + 16 + 17) / 5 = 16.8

Average times of rising in 1 sec. = 16.8 / 5s = 3.36

Average times of rising in 0.4x = 0.4 * 79ch * 3.36 = 106.18

Dwell time = 106.18 * 0.440 = 46.72 [ms]

Limit : Dwell Time < 0.4[s]

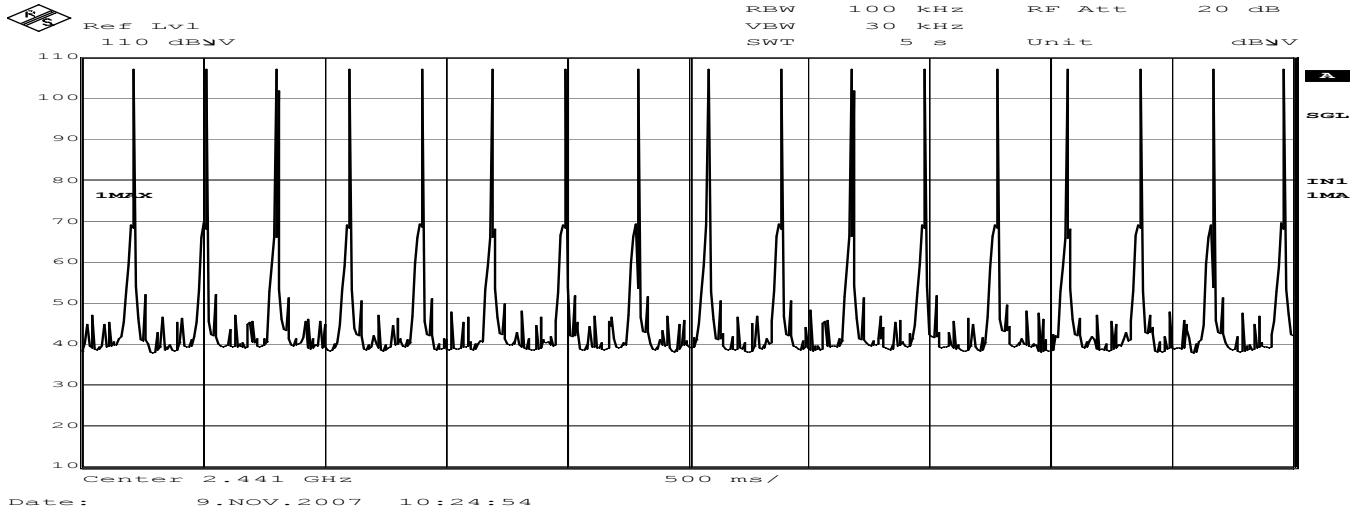
Dwell Time: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

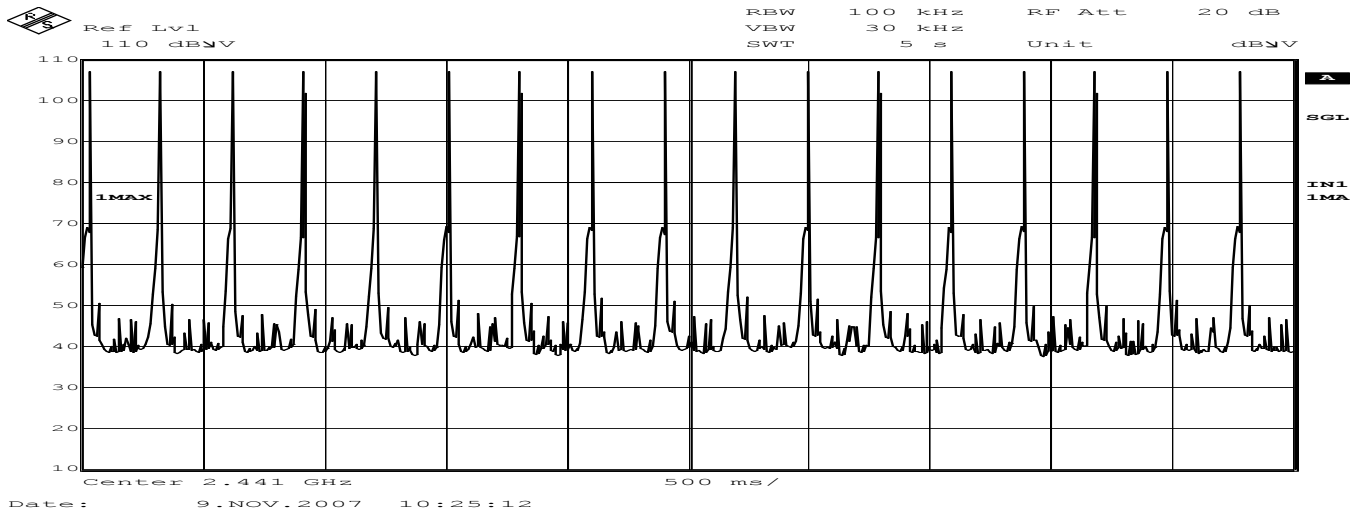
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Hopping (3DH3):

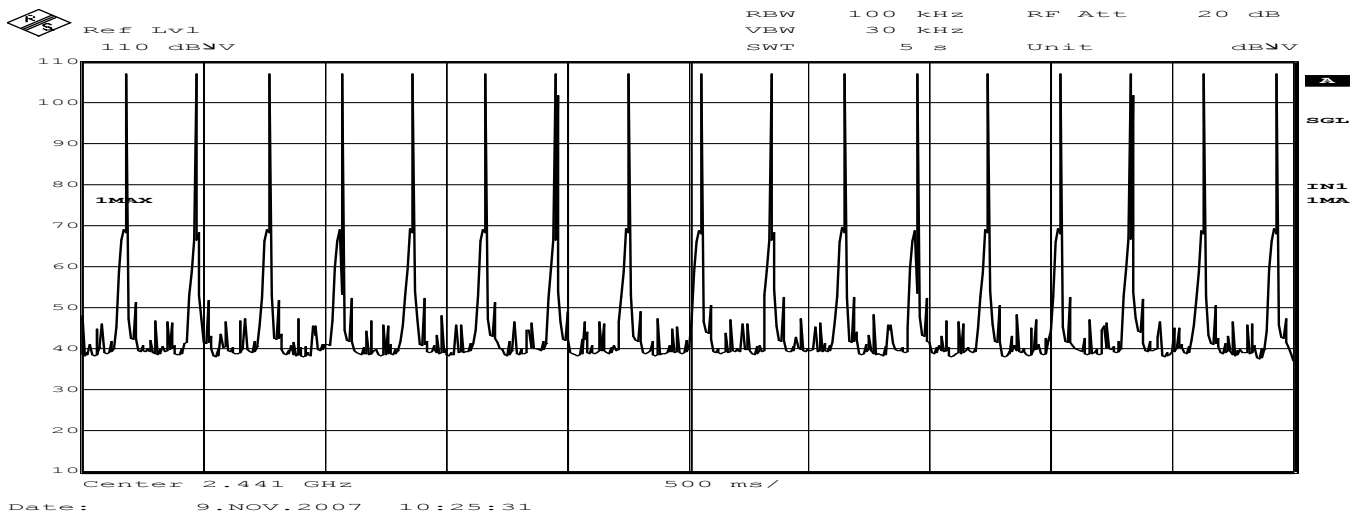
Count 1



Count 2



Count 3

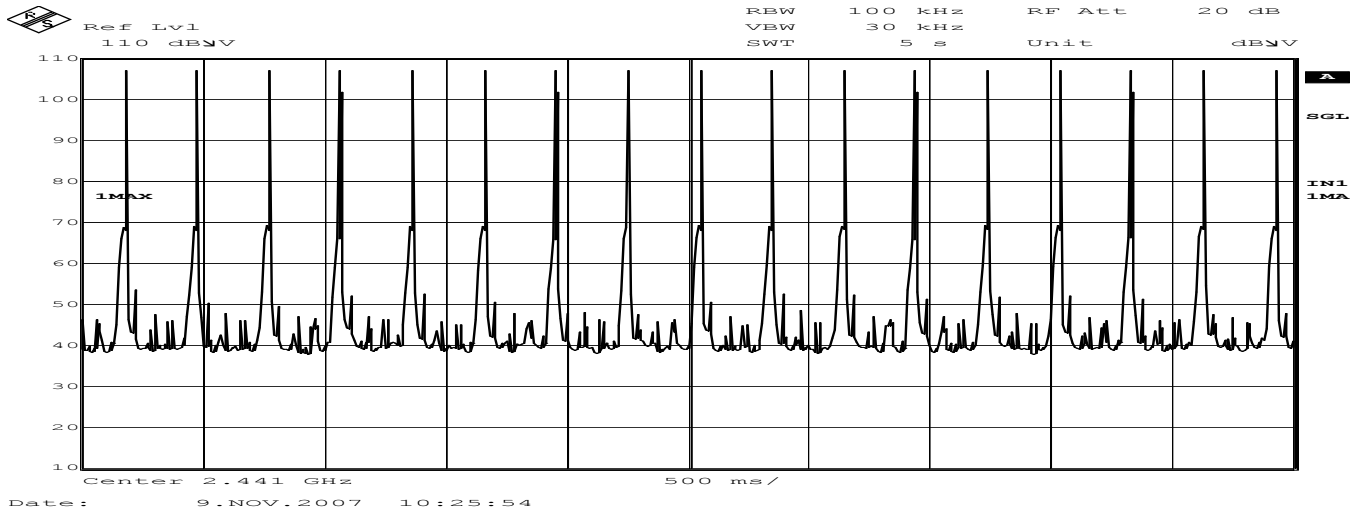


Dwell Time: FCC 15.247(a)(1)(iii)

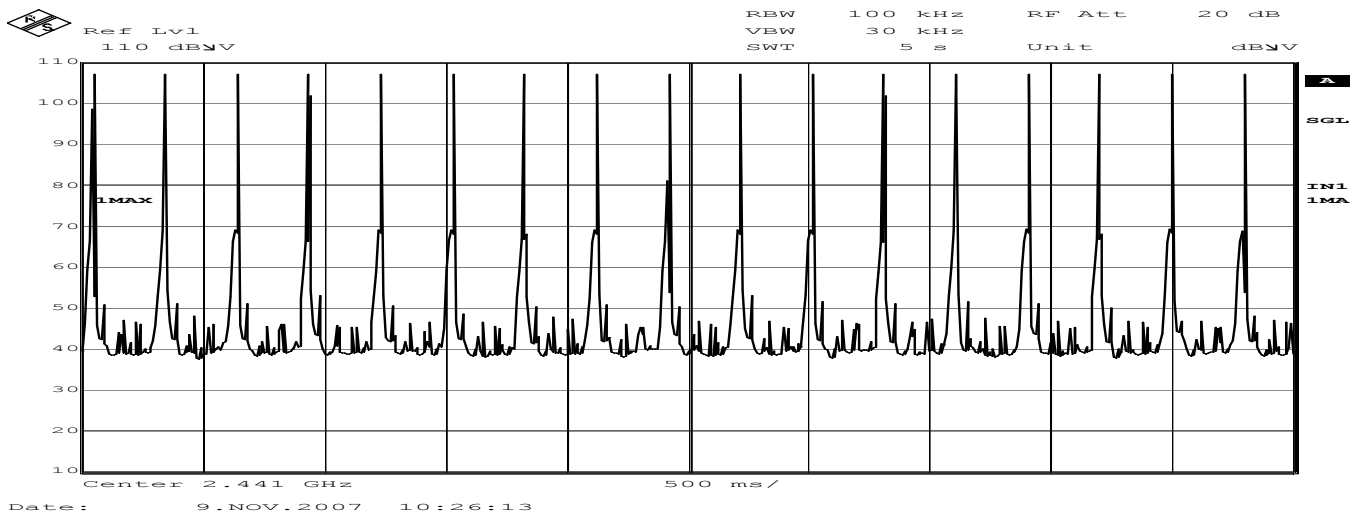
COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

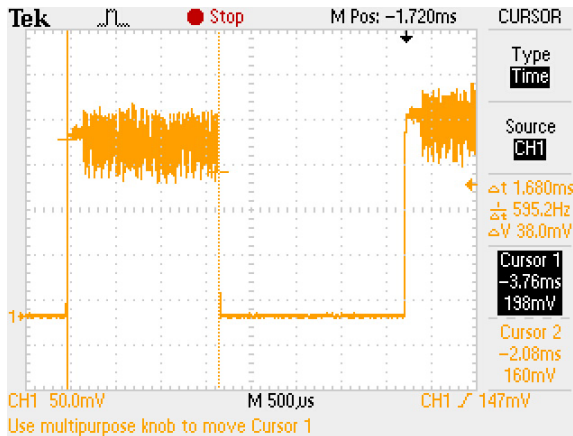
Count 4



Count 5



Duty cycle(Hopping 3DH3)



Average times of rising in 30 sec. of sweep = $(17 + 17 + 17 + 17 + 17) / 5 = 17$
 Average times of rising in 1 sec. = $17 / 5s = 3.4$
 Average times of rising in 0.4x = $0.4 * 79ch * 3.4 = 107.44$
 Dwell time = $107.44 * 1.68 = 180.50$ [ms]
 Limit : Dwell Time < 0.4[s]

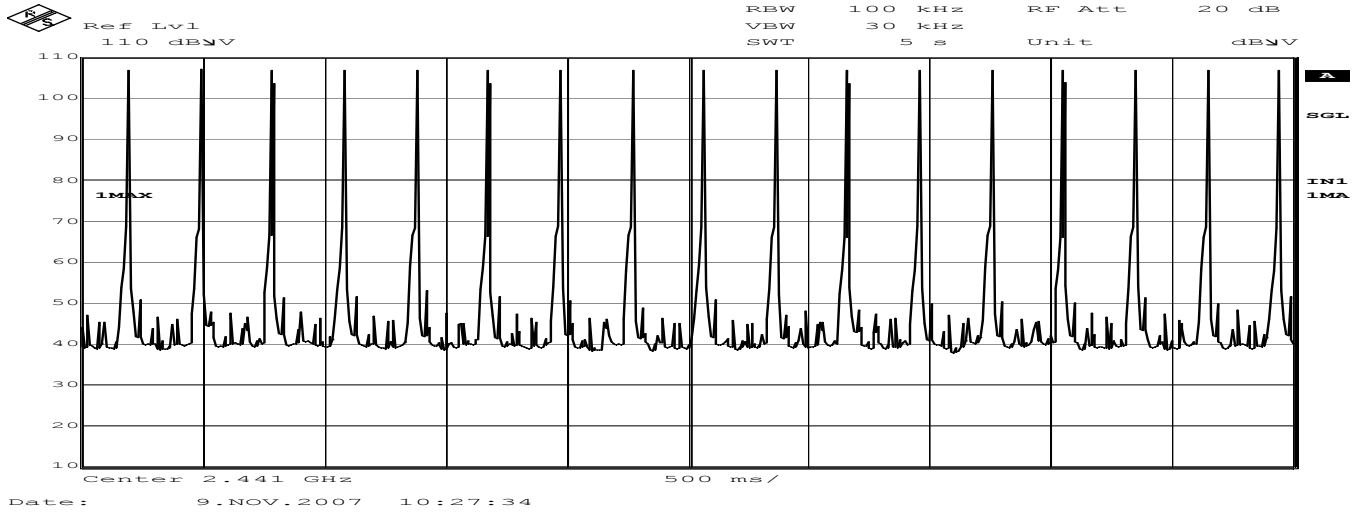
Dwell Time: FCC 15.247(a)(1)(iii)

COMPANY : Alps Electric Co., Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL NUMBER: UGPZ6-C3
SERIAL NUMBER: 0002c752d0e9
FCC ID : CWTUGPZ6-C3
POWER : AC120V/60Hz

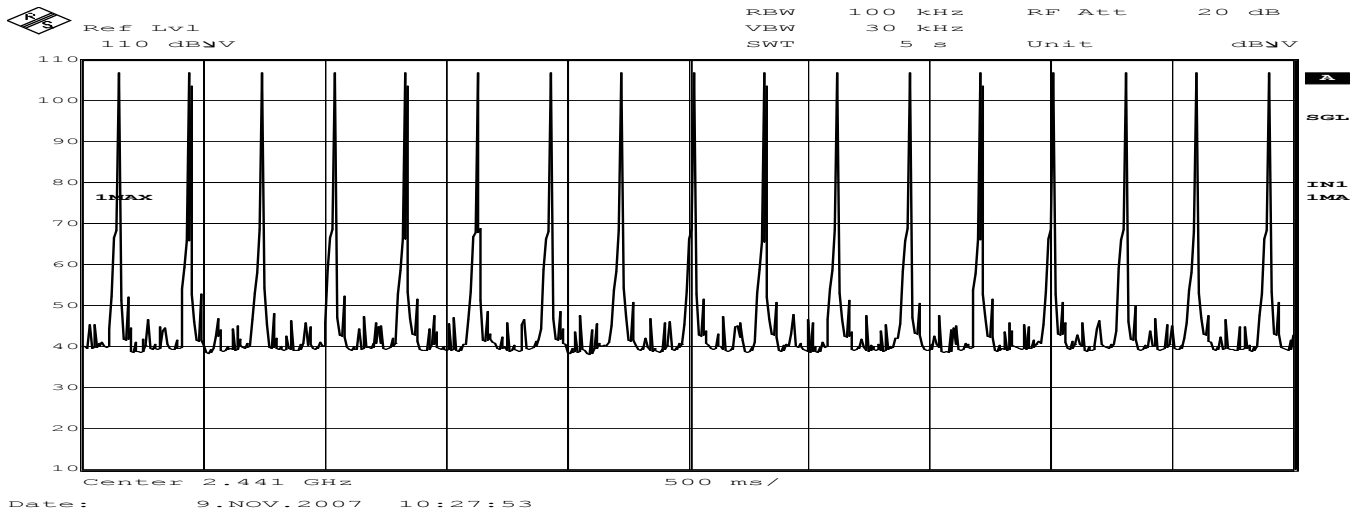
UL Japan, Inc. Yamakita No.4 Shielded Room
REPORT NO : 28DE0007-YK-01-A
REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
DATE : 2007.11.9
TEMP./HUMI : 23deg.C./51%
TEST MODE : Transmitting
ENGINEER : Tatsuya Arai

Hopping (3DH5):

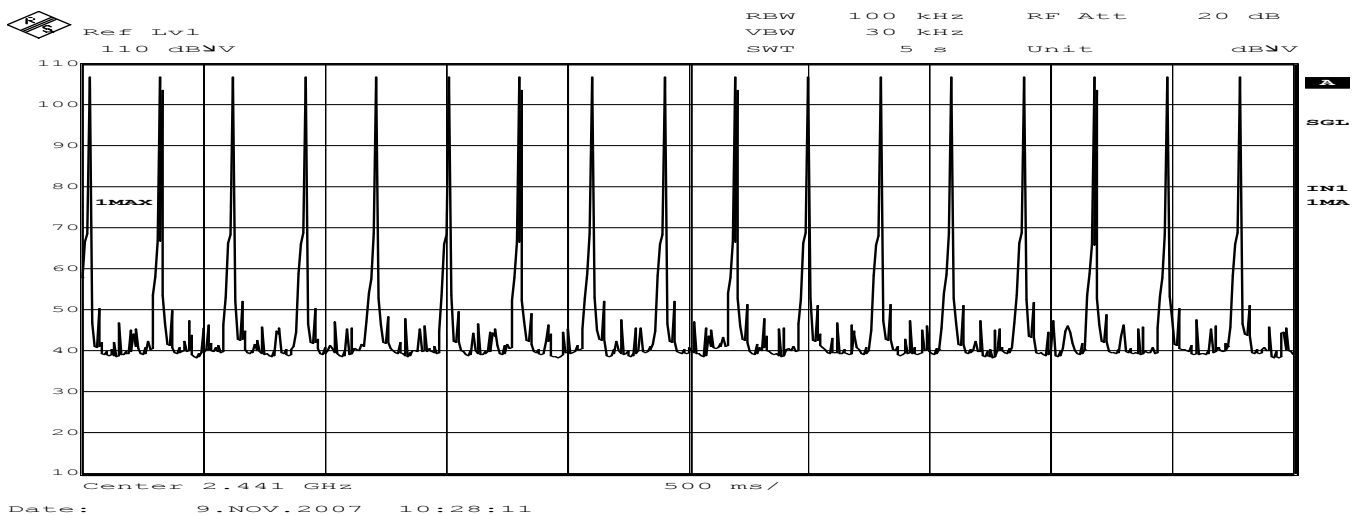
Count 1



Count 2



Count 3

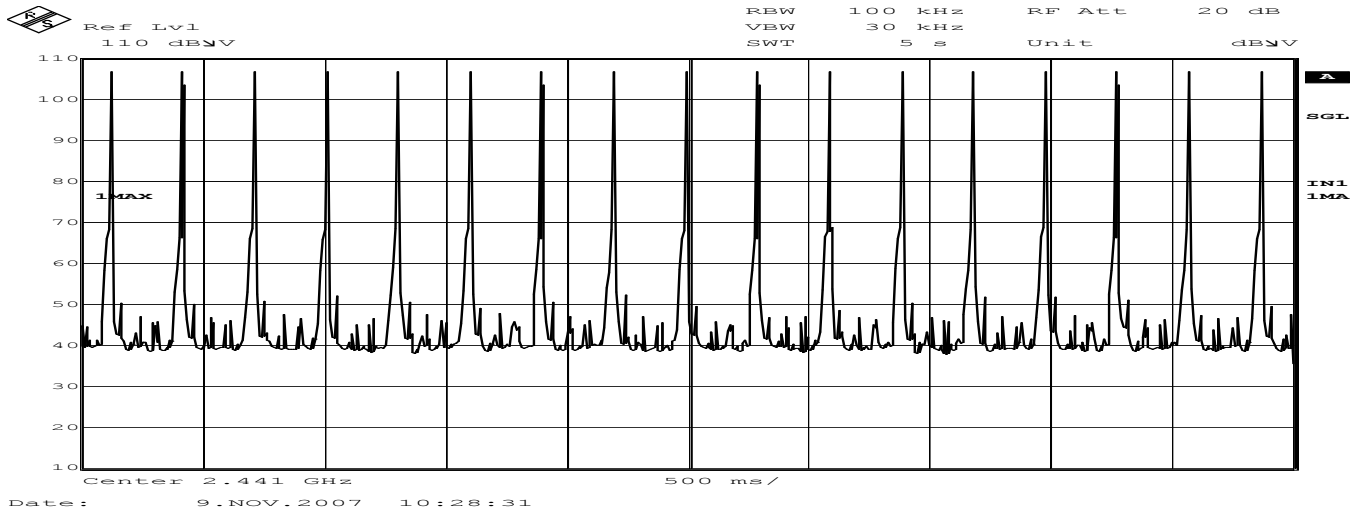


Dwell Time: FCC 15.247(a)(1)(iii)

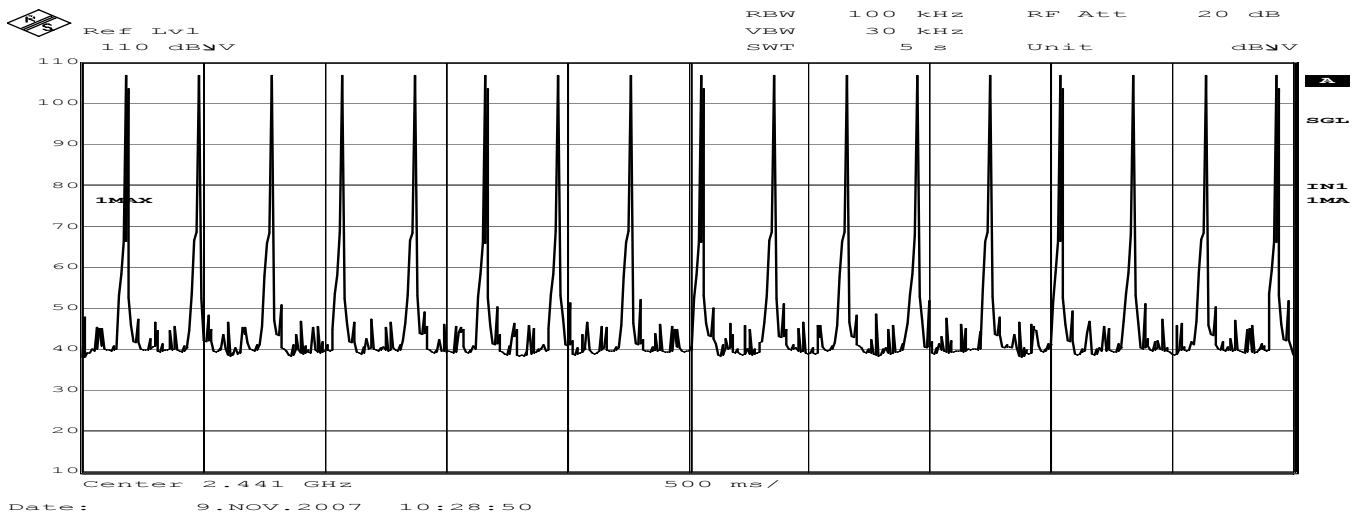
COMPANY : Alps Electric Co., Ltd.
 EQUIPMENT : Bluetooth Transceiver Module
 MODEL NUMBER: UGPZ6-C3
 SERIAL NUMBER: 0002c752d0e9
 FCC ID : CWTUGPZ6-C3
 POWER : AC120V/60Hz

UL Japan, Inc. Yamakita No.4 Shielded Room
 REPORT NO : 28DE0007-YK-01-A
 REGULATION : Fcc Part15SubpartC 247(a)(1)(iii)
 DATE : 2007.11.9
 TEMP./HUMI : 23deg.C./51%
 TEST MODE : Transmitting
 ENGINEER : Tatsuya Arai

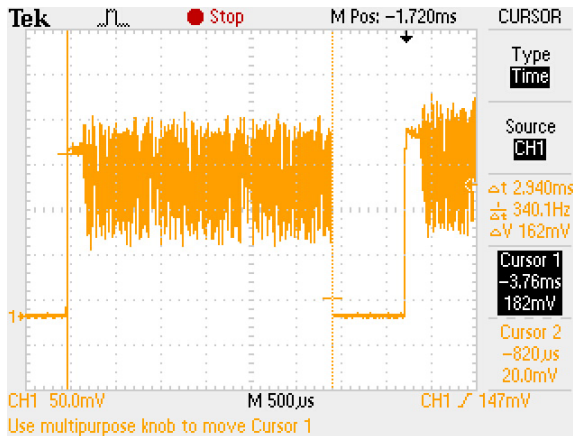
Count 4



Count 5



Duty cycle(Hopping 3DH5)



Average times of rising in 30 sec. of sweep = $(17 + 17 + 17 + 17 + 17) / 5 = 17$
 Average times of rising in 1 sec. = $17 / 5s = 3.4$
 Average times of rising in 0.4x = $0.4 * 79ch * 3.4 = 107.44$
 Dwell time = $107.44 * 2.94 = 315.87$ [ms]
 Limit : Dwell Time < 0.4[s]