


## **EMI TEST REPORT**

**Test Report No. : 23DE0002-YK-1**

**Applicant:** Alps Electric Co., Ltd.  
**Type of Equipment:** Bluetooth Transceiver Module  
**Model No.:** UGPZ3  
**FCC ID:** CWTUGPZ3  
**Test standard:** FCC Part15 Subpart C, Section 15.247  
**Test Result:** Complied

1. This test report shall not be reproduced except in full or partial, without the written approval of A-Pex International Co., Ltd.
2. The results in this report apply only to the sample tested.

**Date of test:** November 20, 21, 22 and 26, 2002

**Tested by:**   
Toyokazu Imamura  
EMC section

**Approved by:**   
Osamu Watatani  
Site Assistant Manager of Yamakita Lab.

---

**A-Pex International Co., Ltd.**

**YAMAKITA LAB.**

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)

<b>Table of Contents</b>	<b>Page</b>
<b>1 GENERAL INFORMATION</b>	<b>3</b>
1.1 Tested Methodology	3
1.2 Test Facility	3
<b>2 PRODUCT DESCRIPTION</b>	<b>4</b>
<b>3 SYSTEM TEST CONFIGURATION</b>	<b>5</b>
3.1 Justification	5
3.2 Configuration of Tested System	6
<b>4 MEASUREMENT UNCERTAINTY</b>	<b>8</b>
<b>5 SUMMARY OF TEST</b>	<b>9</b>
5.1 §15.207 Conducted Emissions	9
5.2 §15.247(a)(1) Frequency Hopping System (Antenna Port Conducted)	9
5.3 §15.247(a)(1)(ii) Channel Utilization (Antenna Port Conducted)	10
5.4 §15.247(b)(3) Maximum Peak Out Put Power (Antenna port Conducted)	10
5.5 §15.247(c) Out of Band Emissions (Radiated)	11
5.6 §15.247(c) Out of Band Emissions (Antenna Port Conducted)	11
<b><u>Contents of Appendixes</u></b>	<b>12</b>
<b>APPENDIX 1: Photographs of test setup</b>	<b>13</b>
<b>APPENDIX 2: Test Data</b>	<b>18</b>
<b>APPENDIX 3: Test instruments</b>	<b>74</b>

---

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)

## 1 GENERAL INFORMATION

Company Name : Alps Electric Co., Ltd.  
Brand Name : ALPS  
Address : 1-7, Yukigaya, Otsuka-cho, Ota-ku, Tokyo, 145-8501 JAPAN  
Telephone Number : +81 3 3726 1211  
Facsimile Number : +81 3 3726 1741  
Contact Person : Masaaki Ueki  
Type of Equipment : Bluetooth Transceiver Module  
Model No. : UGPZ3  
Rating : DC3.3V (1.8V after regulated)  
Country of Manufacture : Japan  
Receipt Date of Sample : November 20, 2002  
Condition of EUT : Production prototype  
Regulation(s) : FCC Part15 Subpart C, Section 15.247  
Test Site : A-Pex Yamakita No.1 Open Test Site

### 1.1 Tested Methodology

The measurements were performed according to the procedures in ANSI C63.4 (2000).  
These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

### 1.2 Test Facility

This site has been fully described in a report submitted to FCC office, and accepted on September 20, 2002 (Registration No.: 95486).  
NVLAP Lab. code : 200441-0

---

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

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

MF060b(23.04.02)

## 2 PRODUCT DESCRIPTION

Alps Electric Co., Ltd. Model: UGPZ3 (referred to as the EUT in this report) is a Bluetooth Transceiver Module. The clock frequency used in EUT is 16MHz (X'tal).

Frequency characteristics	:	2402MHz through 2480MHz
Number of channels/ channel spacing	:	79 channels/ 1MHz channel spacing
Modulation	:	GFSK (Low power Frequency Hopping Spread Spectrum (FHSS))
Antenna type	:	1/4λ Monopole
Antenna model	:	YCE-5255, SSW2400 and LDA92
Antenna Gain	:	4.0dBi (Max)
Operating Voltage	:	DC3.3V +/-0.2V (1.8V after regulated)

The Alps, UGPZ3 with Bluetooth wireless technology is a radio device that transmits and receives radio signals in accordance with the spectrum regulations for the 2.4GHz unlicensed frequency range.

1. Output power, Bluetooth class 2 (+3.0dBm/ 0.002W max)
2. Voltage regulator built in.
3. Flash memory and reference oscillator built in.
4. Board to board connection through USB interface.
5. Three kinds of external antenna provided.

**\*FCC Part15.31 (e)**

The host device provides the Bluetooth Transceiver Module with stable power supply (DC3.3V), and the power is not changed when voltage of the Bluetooth Transceiver Module is varied. Therefore, the Bluetooth Transceiver Module complies power supply regulation.

**\*FCC Part 15.203 Antenna requirement**

When Bluetooth Transceiver Module is put up for sale, only one of the three antennas (YCE-5255, SSW2400 and LDA92) is attached and used with a particular antenna connector. Therefore, Bluetooth Transceiver Module and its antenna comply with this requirement.

---

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)

### 3 SYSTEM TEST CONFIGURATION

#### 3.1 Justification

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

Test mode:

1. Transmitting mode (DH5) : Radiated and Antenna Port Conducted tests  
Performed the test about channels 2402MHz (Low) and 2480MHz (High) channels of all  
Carrier frequencies.
2. Hopping mode : Antenna Port Conducted tests
3. Inquiry mode : Antenna Port Conducted tests
4. Page mode : Antenna Port Conducted tests

---

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

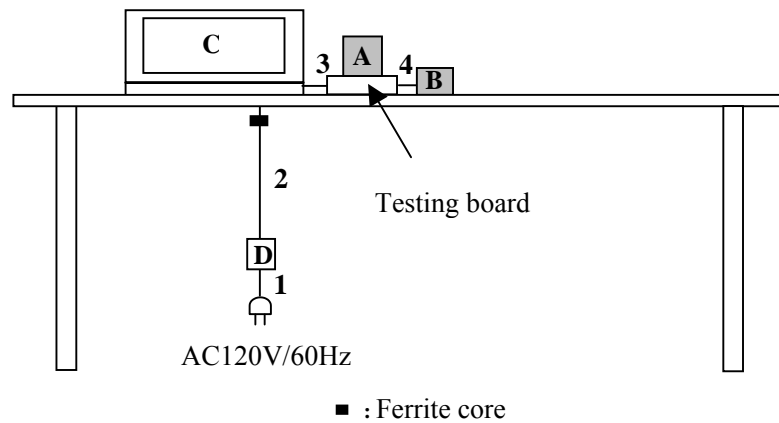
Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)

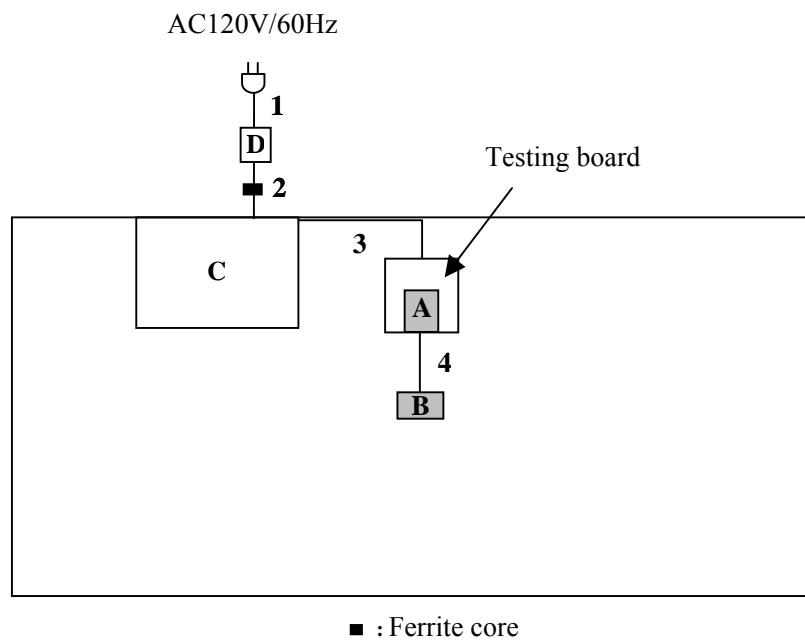
### 3.2 Configuration of Tested System

#### Front View



\*Cabling was taken into consideration and test data was taken under worse case conditions.

#### Top View



\*Cabling was taken into consideration and test data was taken under worse case conditions.

**A-Pex International Co., Ltd.**

**YAMAKITA LAB.**

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)

**Description of EUT and support equipment**

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Bluetooth Transceiver Module	UGPZ3	11	Alps Electric Co., Ltd.	CWTUGPZ3
B	1/4λ Monopole Antenna	YCE-5255	-	YOKOWO	-
	1/4λ Monopole Antenna	SSW2400	-	Sony Chemicals	-
	1/4λ Monopole Antenna	LDA92	-	Murata	-
C	Personal Computer	PC-PJ120H	69029817	SHARP	-
D	AC Adaptor	EA-J03V	LTD0022031941	SHARP	-

**List of cables used**

No.	Name	Length (m)	Shield	Backshell material
1	AC Main Cable	1.8	Unshielded	Polyvinyl chloride
2	DC Cable	1.2	Unshielded	Polyvinyl chloride
3	USB Cable	0.95	Shielded	Polyvinyl chloride
4	Coaxial Cable	0.05	Shielded	Polyvinyl chloride

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)

## 4 MEASUREMENT UNCERTAINTY

### Conducted emission test

The measurement uncertainty (with a 95% confidence level) for this test was  $\pm 1.3$ dB.

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

### Radiated emission test

The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is  $\pm 4.8$ dB.

The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is  $\pm 5.2$ dB.

The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is  $\pm 6.6$ dB.

The data listed in this test report may exceed the test limit because it does not have enough margin.

---

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)



## 5 SUMMARY OF TESTS

### 5.1 §15.207 Conducted Emissions (Limits by CISPR Pub.22 Class B)

#### Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals 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 LISN and excess AC cable was bundled in center.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT on a shielded room. The EUT was connected to a Line Impedance Stabilization Network (LISN).

An overview sweep with peak detection has been performed.

The measurements have been performed with a CISPR quasi-peak detector (IF BW 9kHz).  
(Measurement range : 150kHz to 30MHz)

**Test data** : APPENDIX Page 18 to 24  
**Photographs of test setup:** Page 13  
**Test result** : Pass  
**Test instruments** : KCC-14/15/16/18/KPL-01, KLS-01, KSA-01, KTR-01

### 5.2 §15.247 (a)(1) Frequency Hopping Systems

Bluetooth Transceiver Module uses 79channels, each 1MHz wide.  
On Average, each channel is used equally.

**Test data** : APPENDIX Page 25  
**Test result** : Pass  
**Test instruments** : KTR-01, KCC-D5

---

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

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

MF060b(23.04.02)

---

### 5.3 §15.247 (a)(1)(ii) Channel Utilization

The total number of channel is 79.

**Test data** : APPENDIX Page 26 to 29  
**Test result** : Pass  
**Test instruments** : KTR-01, KCC-D5

20dB Band Width

1. 2402MHz (Low) : 0.9499MHz < 1MHz
2. 2480MHz (High) : 0.9499MHz < 1MHz

**Test data** : APPENDIX Page 30  
**Test result** : Pass  
**Test instruments** : KTR-01, KCC-D5

Dwell Time

Spectrum analyzer was set as center frequency 2402MHz, dwell time 30sec. (Hopping mode)

Spectrum analyzer was set as center frequency 2402MHz, dwell time 1sec. (Inquiry and page mode)

1. Hopping mode

As a result of observation with Bluetooth Transceiver Module was on hopping condition,

101.6 Average times Hopping were appeared per 1 channel.

Maximum transmit ON time per appeared hopping is 2.90ms (DH5)

$$101.6 * 2.90\text{ms} = 294.64\text{ms} < 400\text{ms}$$

2. Inquiry mode

As a result of observation with Bluetooth Transceiver Module was on hopping condition,

100 Average times Inquiry were appeared per 1 channel.

Maximum transmit ON time per appeared hopping is 120 $\mu$ s (Inquiry mode: 32ch)

$$100 * (0.4 * 32) * 120\mu\text{s} = 153.6\text{ms} < 400\text{ms}$$

3. Page mode

As a result of observation with Bluetooth Transceiver Module was on hopping condition,

100 Average times Page were appeared per 1 channel.

Maximum transmit ON time per appeared hopping is 121 $\mu$ s (Page mode: 32ch)

$$100 * (0.4 * 32) * 121\mu\text{s} = 154.88\text{ms} < 400\text{ms}$$

**Test data** : APPENDIX Page 31 to 36  
**Test result** : Pass  
**Test instruments** : KTR-01, KCC-D5, KST-01

### 5.4 § 15.247(b)(3) Maximum Peak Out Put Power (Antenna Port Conducted)

**Test Procedure**

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

\* Antenna Gain dose not exceed 6dBi.

**Test data** : APPENDIX Page 37  
**Test result** : Pass  
**Test instruments** : KPM-05, KPSS-01

---

*A-Pex International Co., Ltd.*

**YAMAKITA LAB.**

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)



### **APPENDIX 1: Photographs of test setup**

1. Page 13	:	Conducted emission
2. Page 14	:	Radiated emission
3. Page 15 - 17	:	Pre check of worse-case position

### **APPENDIX 2: Test Data**

1. Page 18 - 24	:	Conducted emission
2. Page 25	:	Channel Separation (Antenna Port Conducted)
3. Page 26 - 29	:	Channel Utilization (Antenna Port Conducted)
4. Page 30	:	20dB Bandwidth (Antenna Port Conducted)
5. Page 31 - 36	:	Dwell Time (Antenna Port Conducted)
6. Page 37	:	Maximum Peak Power (Antenna Port Conducted)
7. Page 38 - 67	:	Out of Band Emissions (Radiated)
8. Page 68 - 73	:	Out of Band Emissions (Antenna Port Conducted)

### **APPENDIX 3: Test instruments**

Page 74	:	Test instruments
---------	---	------------------

---

***A-Pex International Co., Ltd.***

***YAMAKITA LAB.***

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

Telephone: +81 465 77 1011

Facsimile: +81 465 77 2112

MF060b(23.04.02)

**Conducted emission**



---

***A-Pex International Co., Ltd.***  
***YAMAKITA LAB.***

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

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

MF060b(23.04.02)

**Radiated emission**



---

***A-Pex International Co., Ltd.***  
***YAMAKITA LAB.***

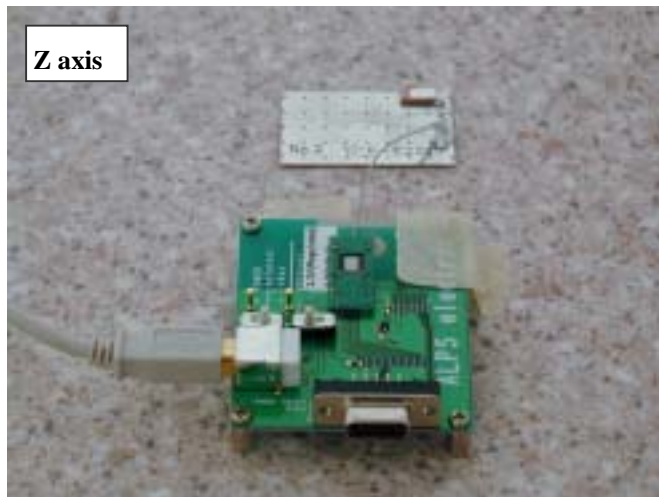
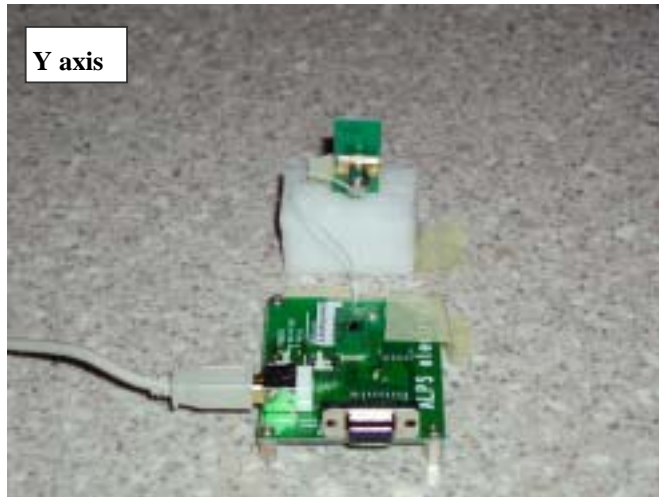
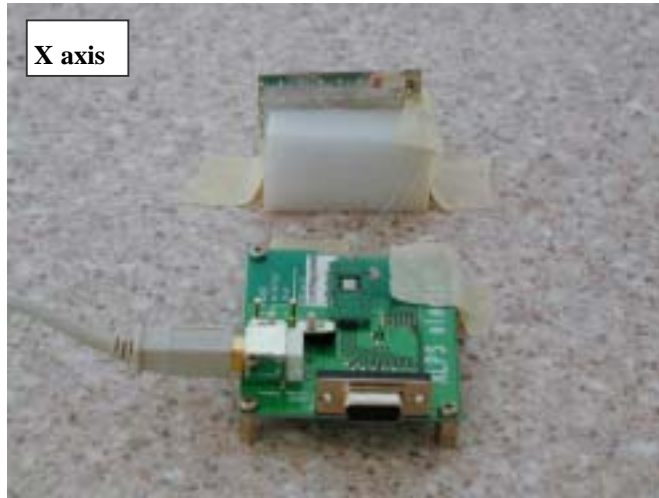
907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

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

MF060b(23.04.02)

---

Pre check of worse-case position (YCE-5255)



---

**A-Pex International Co., Ltd.**  
**YAMAKITA LAB.**

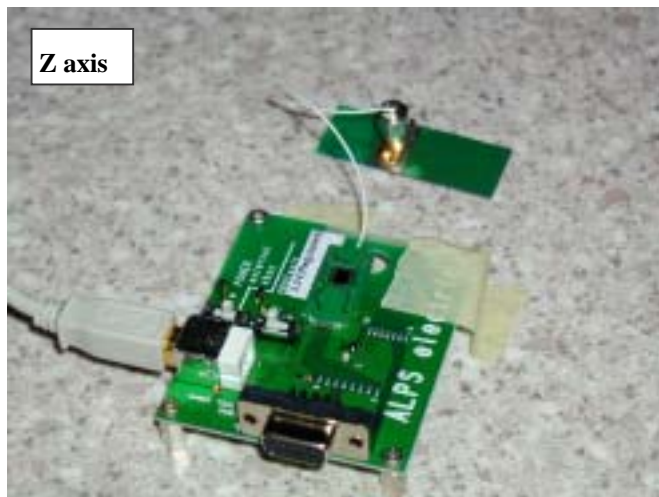
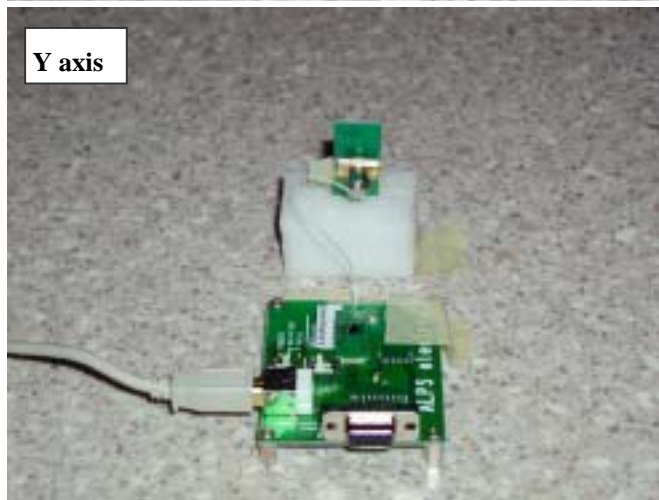
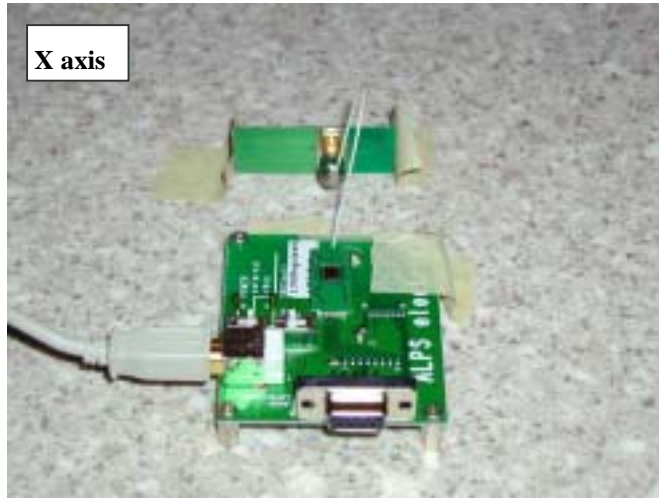
907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

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

MF060b(23.04.02)

---

Pre check of worse-case position (SSW2400)



---

**A-Pex International Co., Ltd.**  
**YAMAKITA LAB.**

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

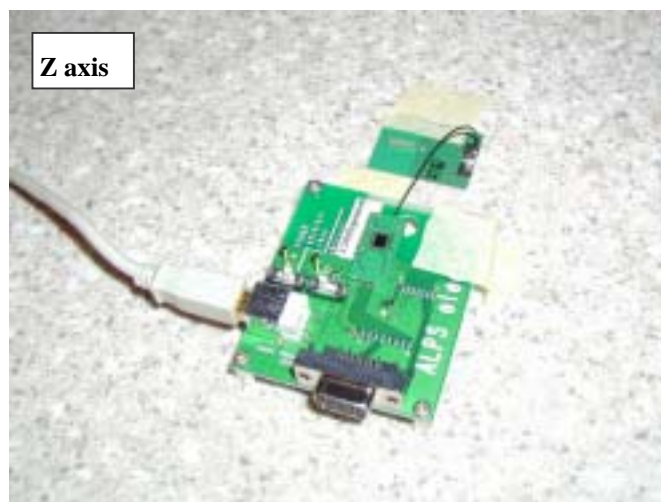
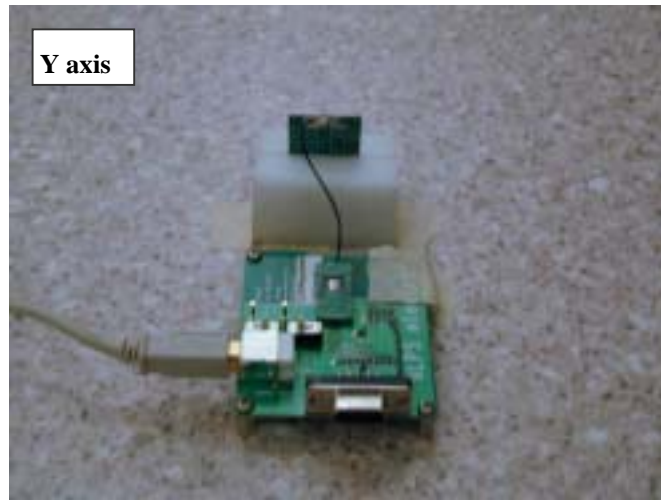
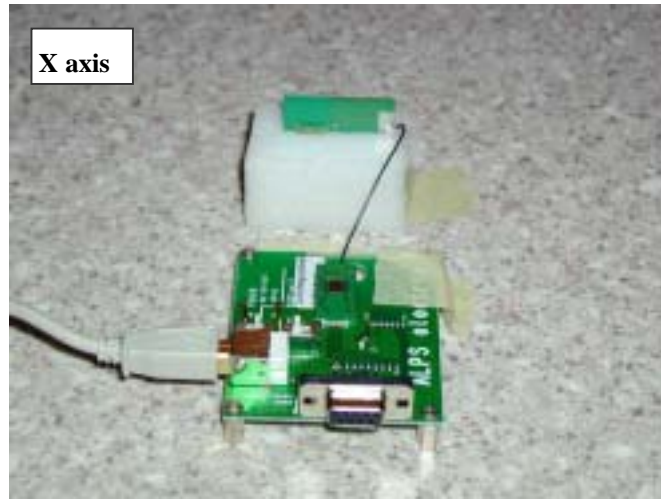
Telephone: +81 465 77 1011  
Facsimile: +81 465 77 2112

MF060b(23.04.02)



---

Pre check of worse-case position (LDA92)



---

**A-Pex International Co., Ltd.**  
**YAMAKITA LAB.**

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

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

MF060b(23.04.02)

# DATA OF CONDUCTION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Shielded Room  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting(2402MHz)  
Remarks : Tx Antenna Type: YGE-5255  
Date : 11/22/2002  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 41 %  
Regulation : FCC Part15C § 15.207. (CISPR Pub. 22 )

  
Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dBuV]	AV	QP [dBuV]	AV				QP [dBuV]	AV	QP [dBuV]	AV	QP [dB]	AV
1.	0.1500	43.7	-	43.9	-	0.0	0.1	0.0	44.0	-	66.0	56.0	22.0	-
2.	0.2050	44.2	31.2	44.8	31.2	0.0	0.1	0.0	44.9	31.3	63.4	53.4	18.5	22.1
3.	0.2740	33.2	-	33.2	-	0.0	0.1	0.0	33.3	-	61.0	51.0	27.7	-
4.	0.3415	27.8	-	29.3	-	0.0	0.1	0.0	29.4	-	59.2	49.2	29.8	-
5.	1.6260	17.6	-	24.3	-	0.1	0.3	0.0	24.7	-	56.0	46.0	31.3	-
6.	12.2930	17.4	-	16.9	-	0.3	1.2	0.0	18.9	-	60.0	50.0	41.1	-

CALCULATION: READING[dB μV] + LISN FACTOR[dB] + CABLE LOSS[dB] + ATTEN[dB].

■ LISN : KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-14/15/16/18  
■ EMI RECEIVER: KTR-01 (ES140) ■ PULSE LIMITTER: KPL-01 (PL01)


# DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.1 Shielded Room

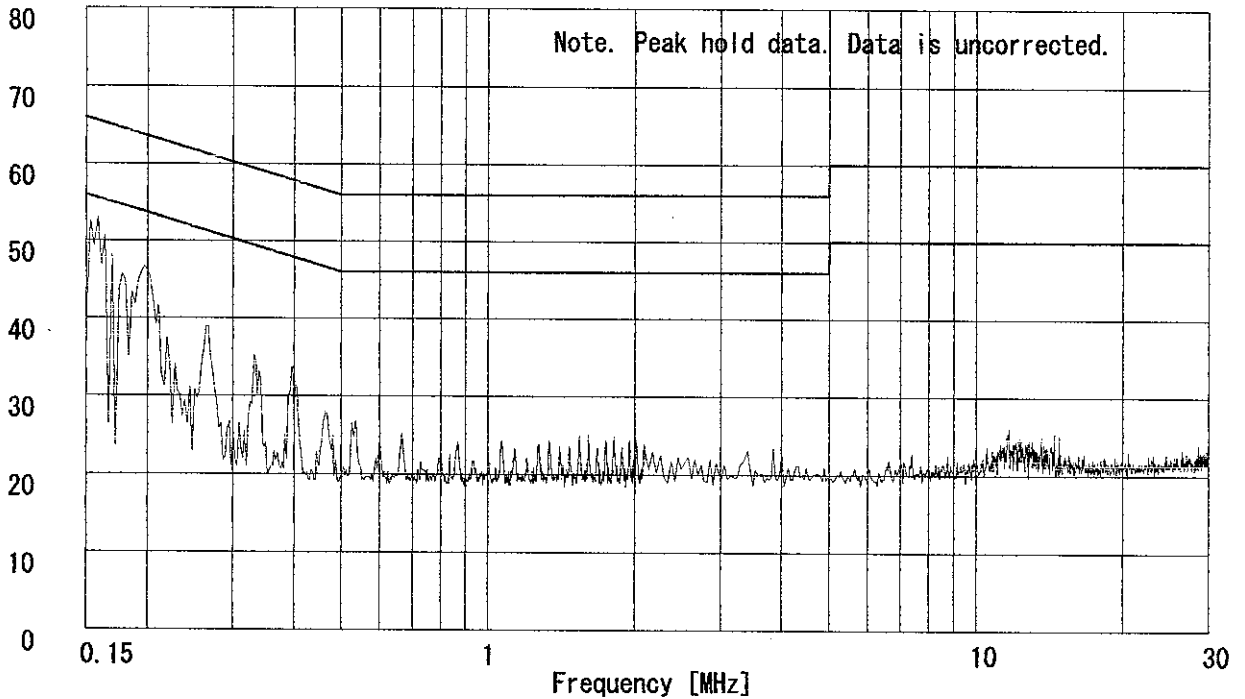
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: YCE-5255  
Date : 11/22/2002  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 41 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : FCC Part15C § 15.207. (CISPR Pub. 22 )

  
Engineer : Toyokazu Imamura

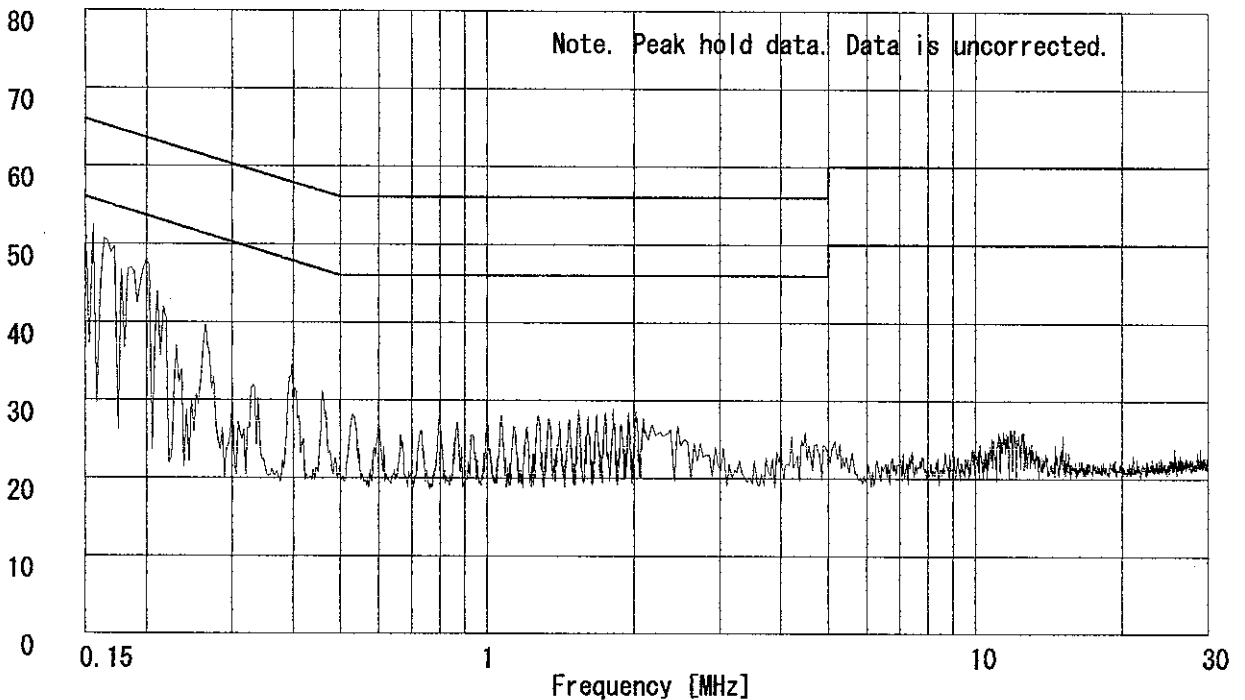
Emission Level [dB $\mu$ V]

PHASE:N



Emission Level [dB $\mu$ V]


PHASE:L1



# DATA OF CONDUCTION TEST CHART

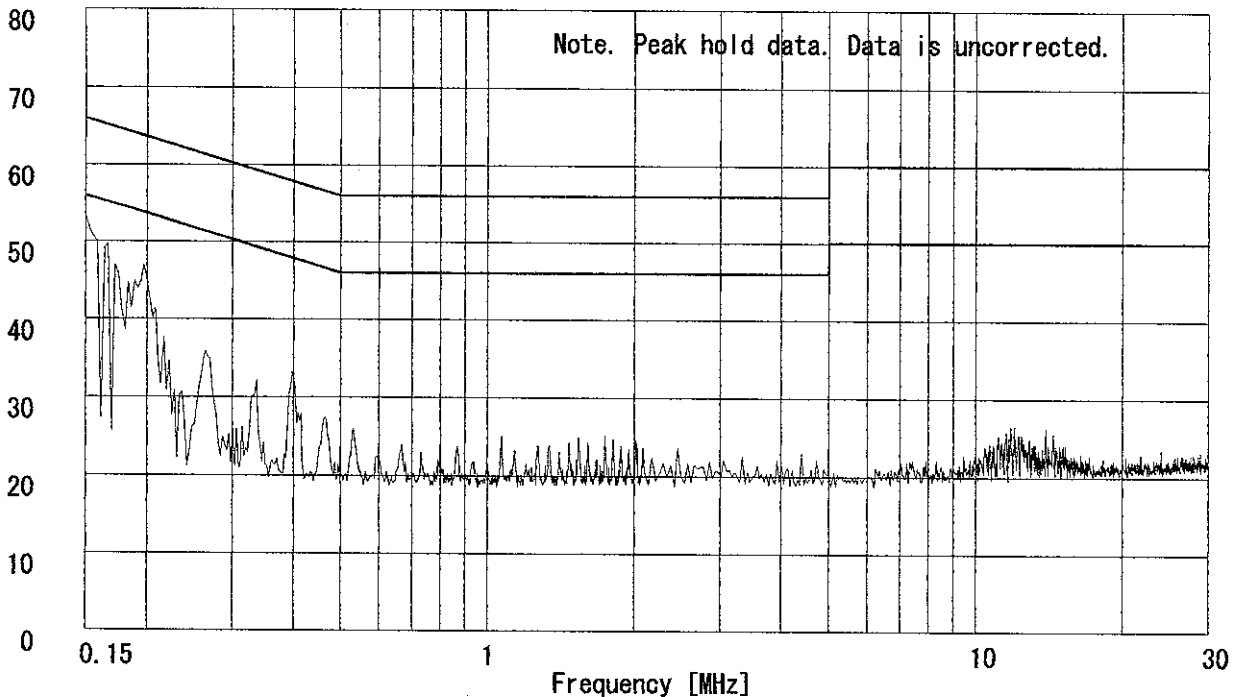
A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Shielded Room  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: YCE-5255  
Date : 11/22/2002  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 41 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : FCC Part15C § 15.207. (CISPR Pub. 22 )

  
Engineer : Toyokazu Imamura

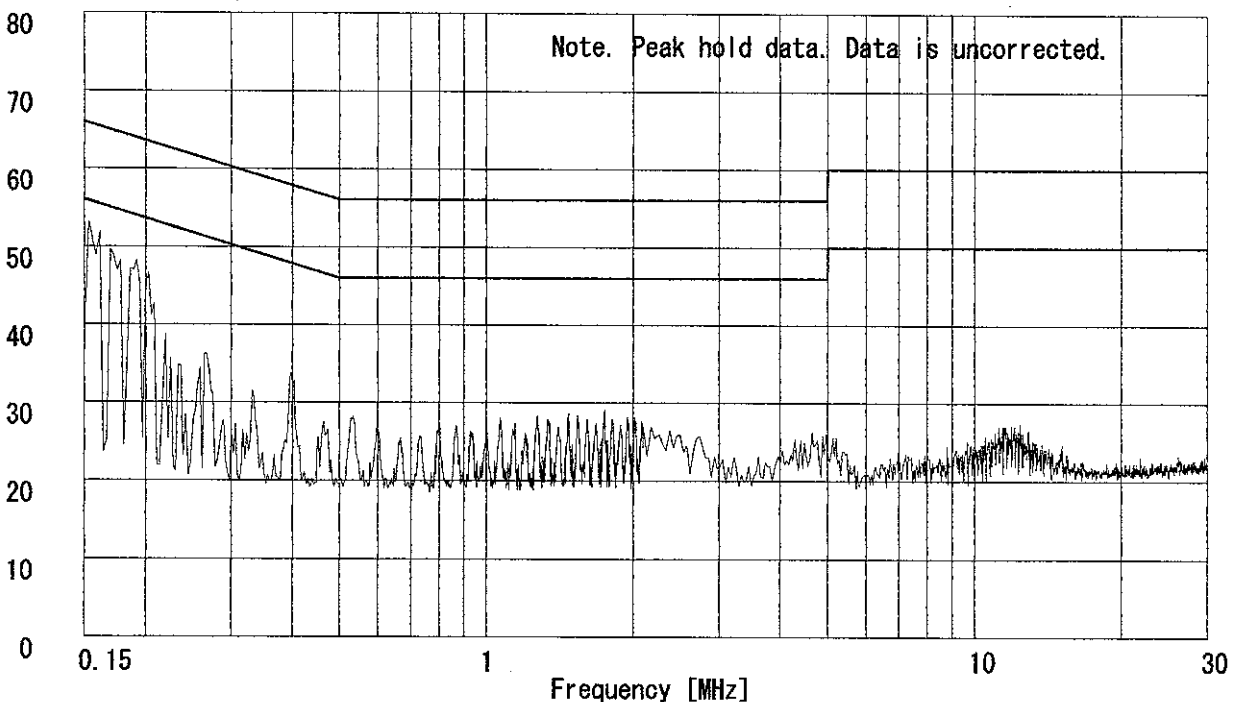
Emission Level [dB $\mu$ V]

PHASE:N



Emission Level [dB $\mu$ V]

PHASE:L1

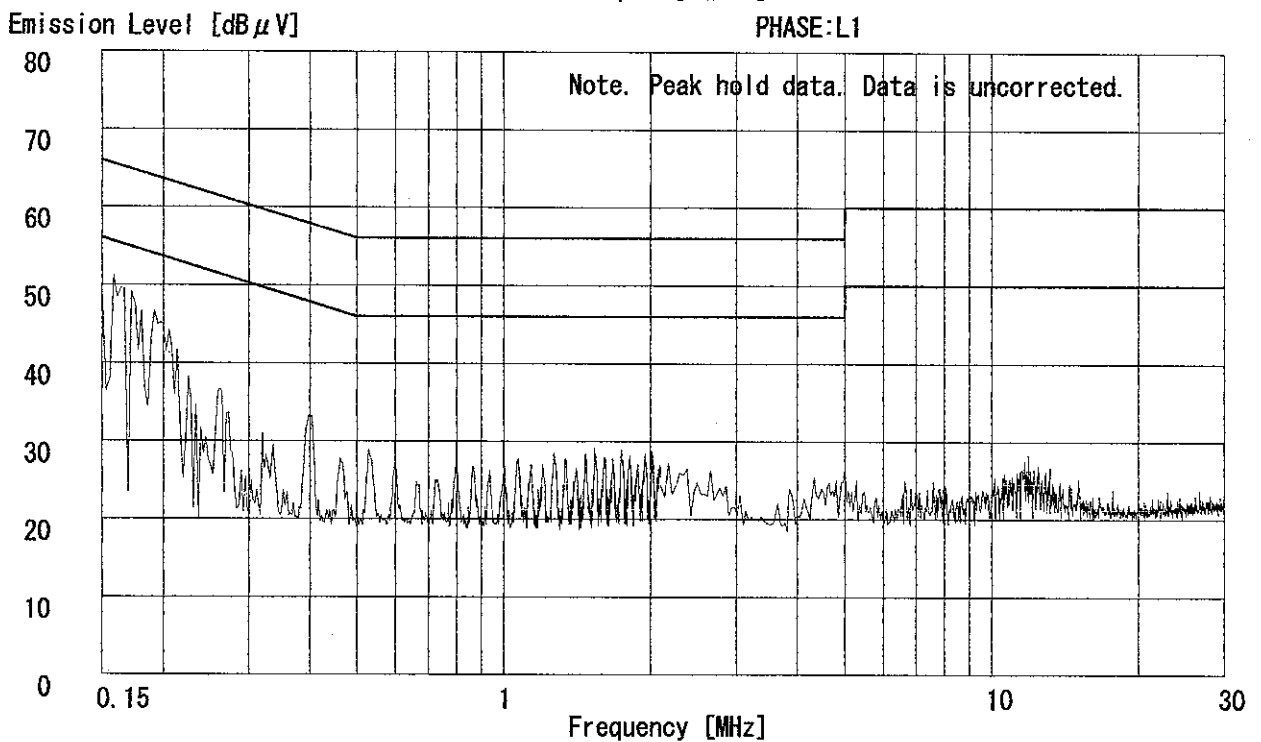
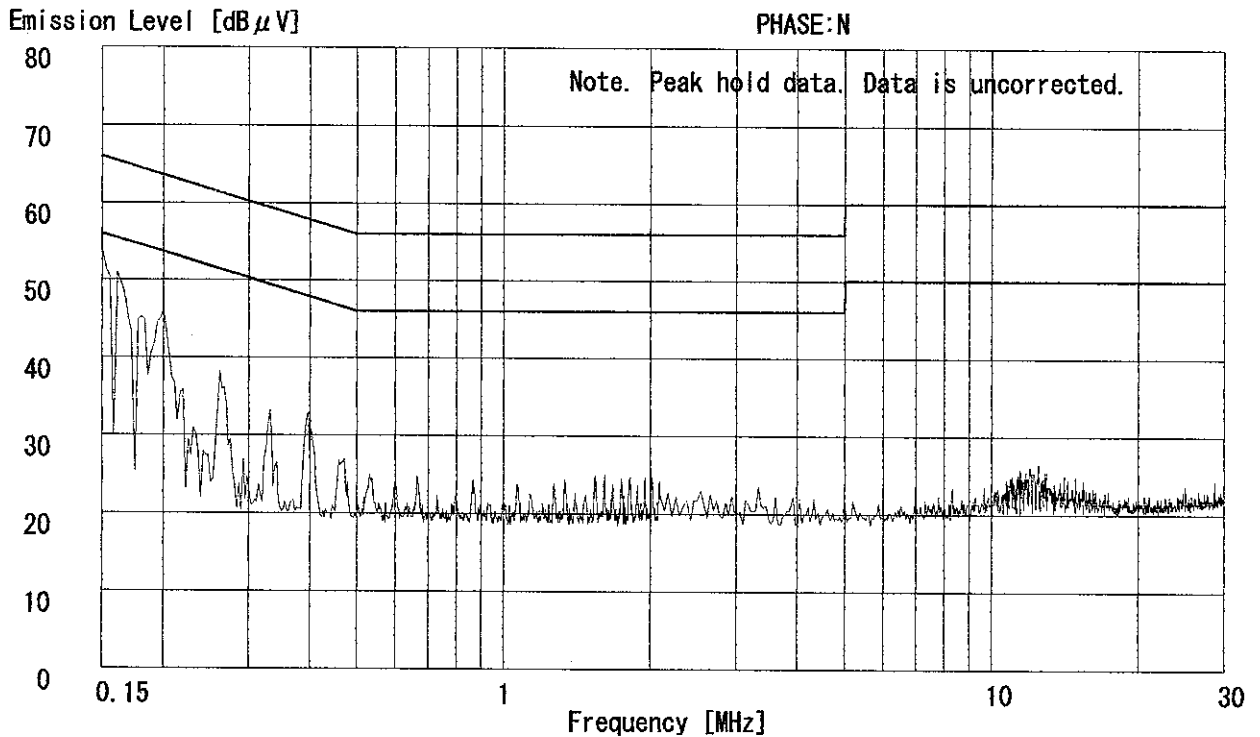


# DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Shielded Room  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/22/2002  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 41 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : FCC Part15C § 15.207. (CISPR Pub. 22 )

  
Engineer : Toyokazu Imamura




# DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.1 Shielded Room

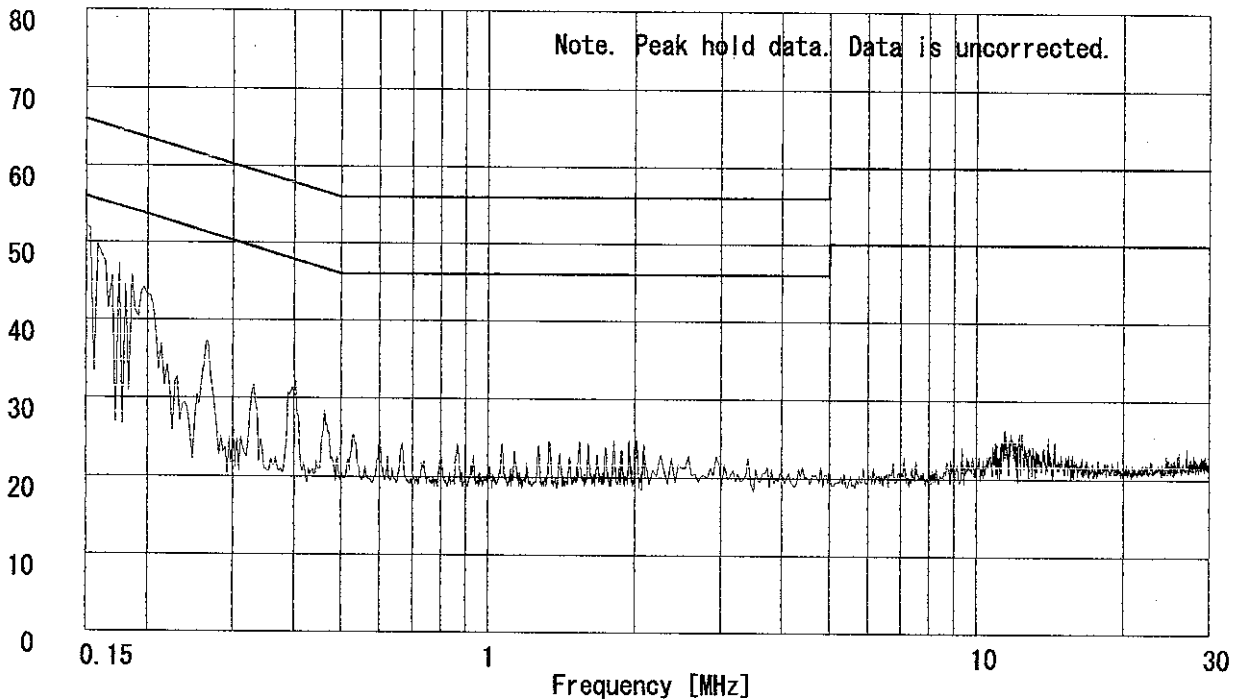
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/22/2002  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 41 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : FCC Part15C § 15.207. (CISPR Pub. 22 )

  
Engineer : Toyokazu Imamura

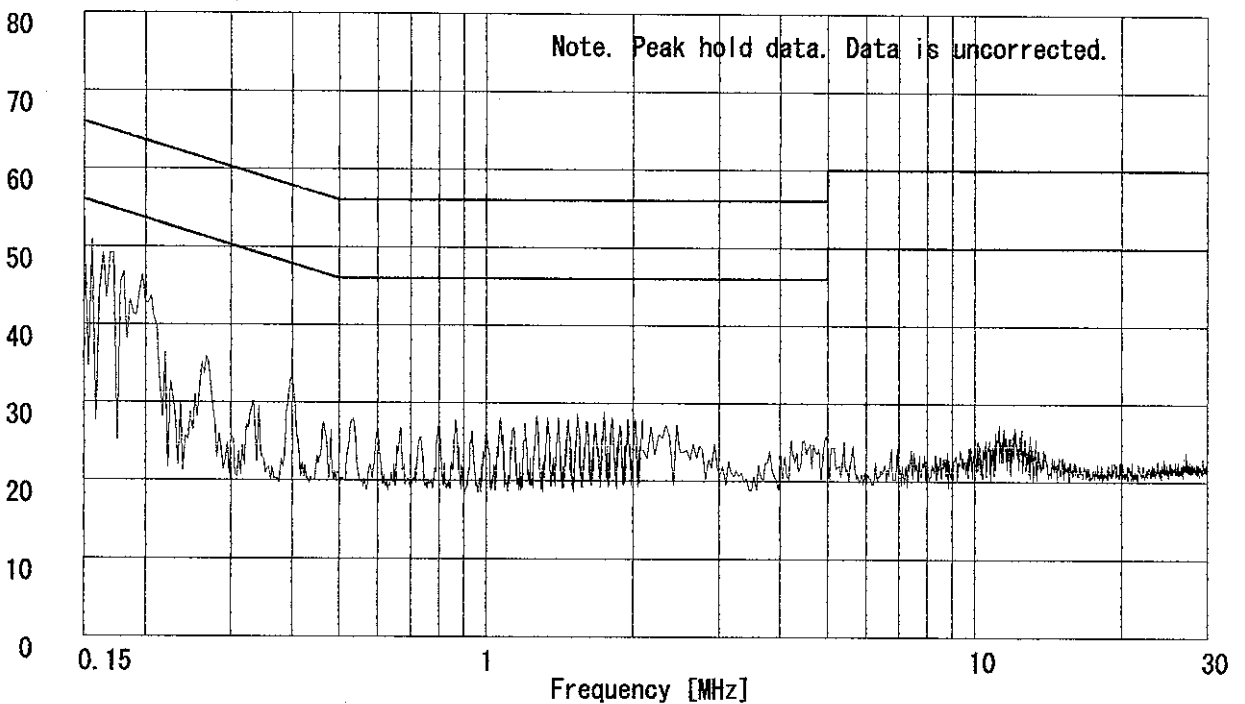
Emission Level [dB $\mu$ V]

PHASE:N



Emission Level [dB $\mu$ V]

PHASE:L1



# DATA OF CONDUCTION TEST CHART

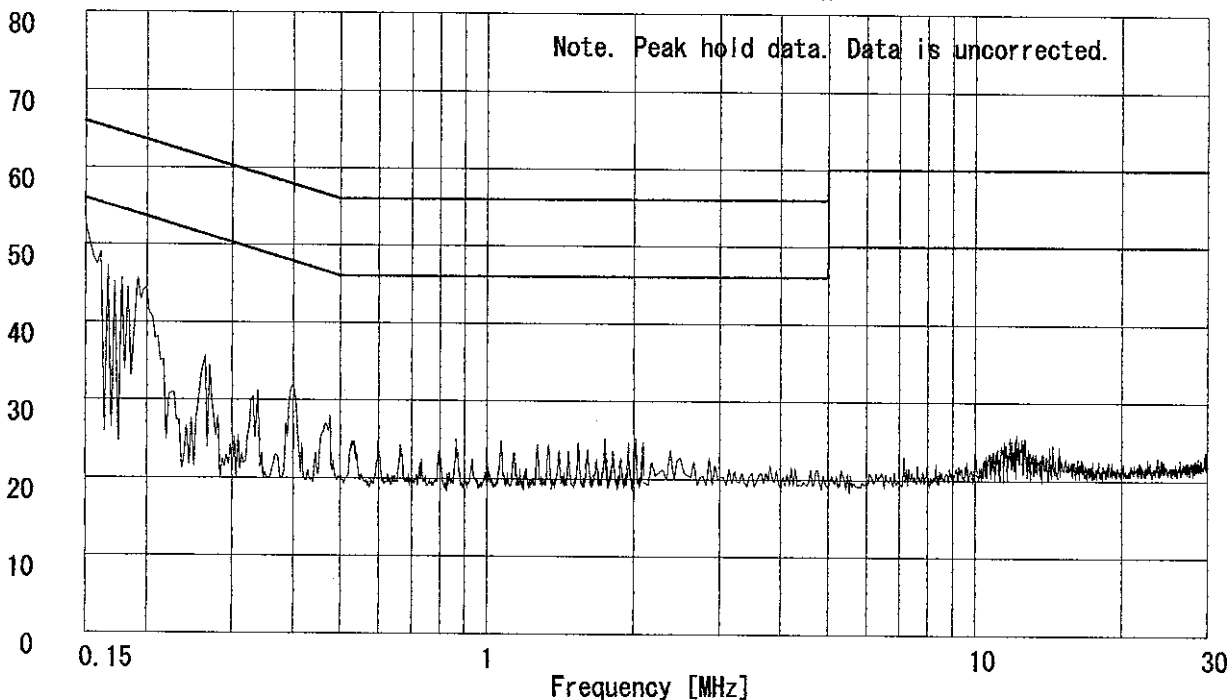
A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Shielded Room  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PG:AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: LDA92  
Date : 11/22/2002  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 41 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : FCC Part15C § 15.207. (CISPR Pub. 22 )

  
Engineer : Toyokazu Imamura

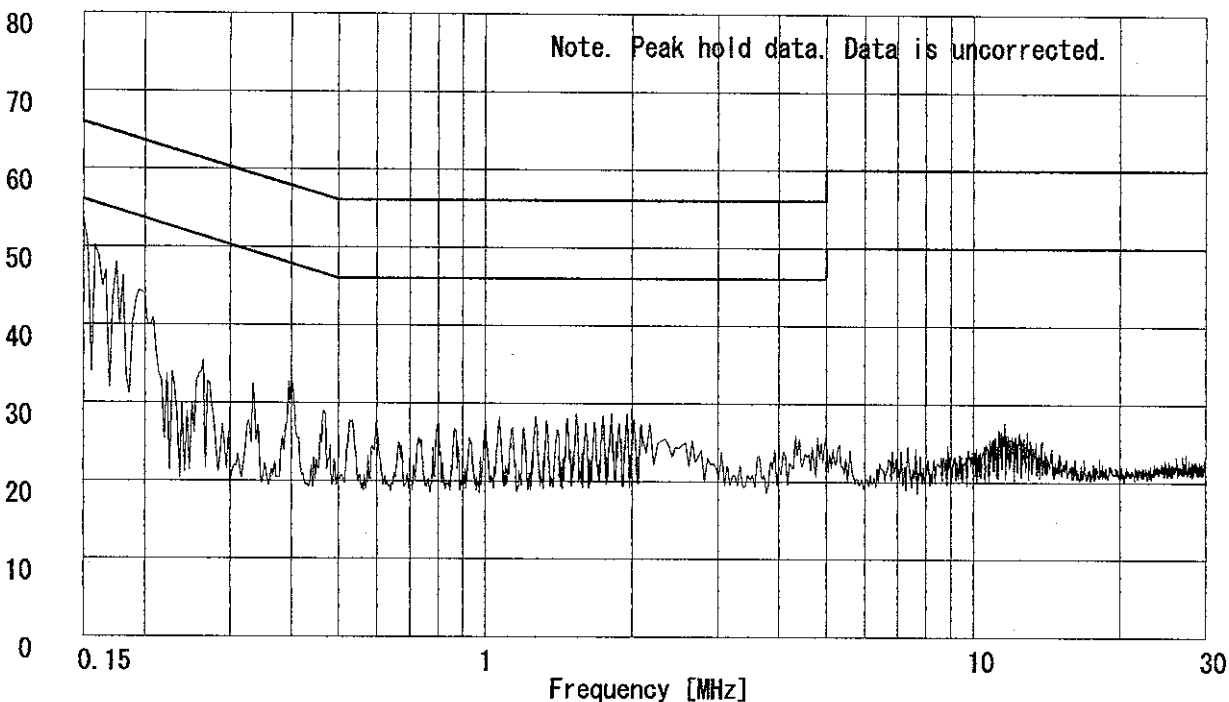
Emission Level [dB $\mu$ V]

PHASE:N



Emission Level [dB $\mu$ V]

PHASE:L1



# DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.1 Shielded Room

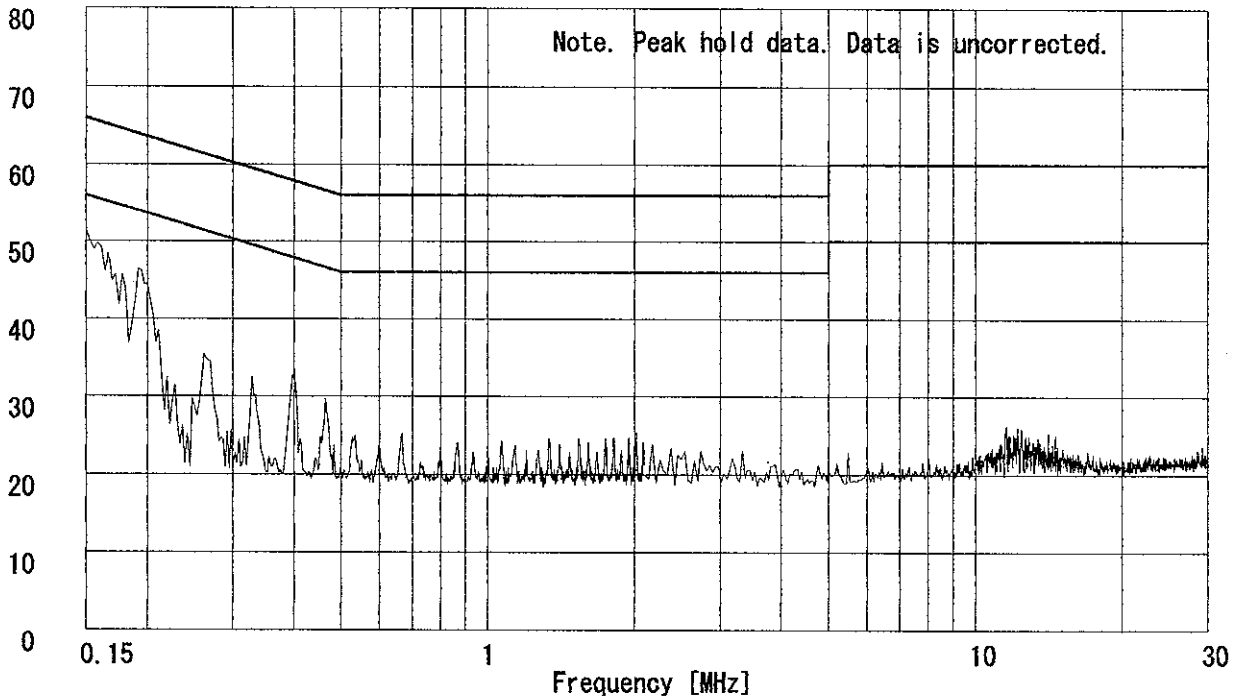
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: LDA92  
Date : 11/22/2002  
Phase : Single Phase  
Temperature : 25 °C  
Humidity : 41 %  
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22 )  
Regulation 2 : FCC Part15C § 15.207. (CISPR Pub. 22 )

  
Engineer : Toyokazu Imamura

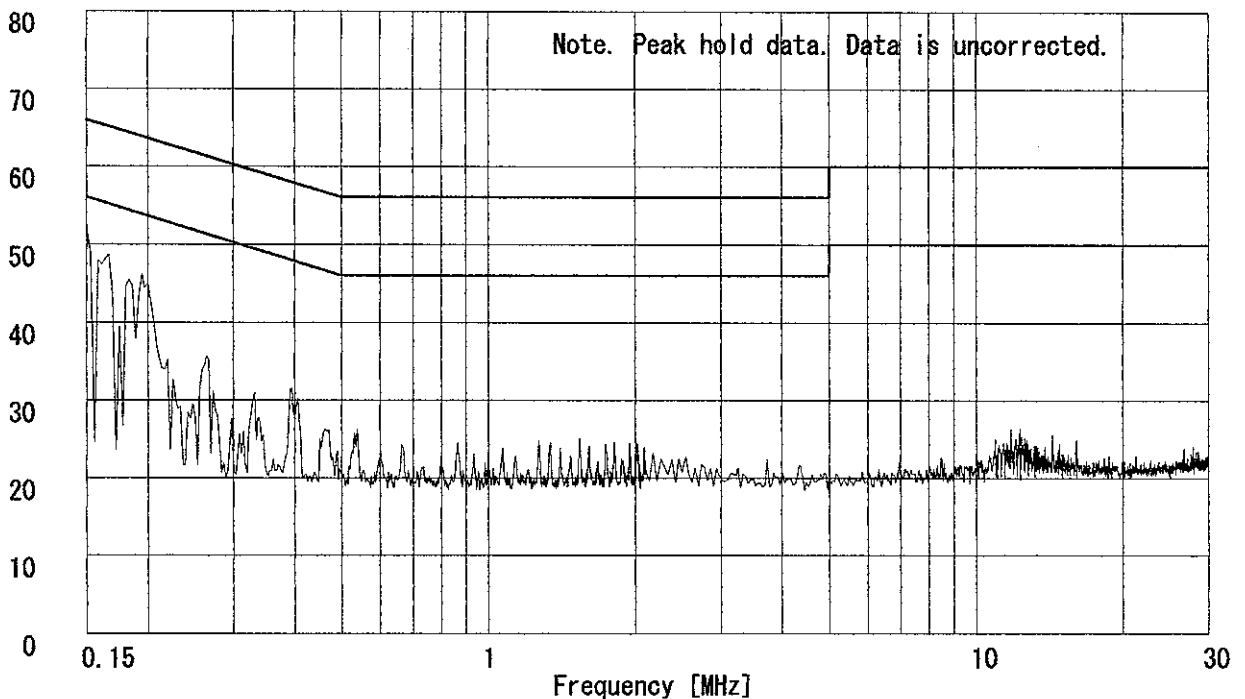
Emission Level [dB $\mu$ V]

PHASE:N



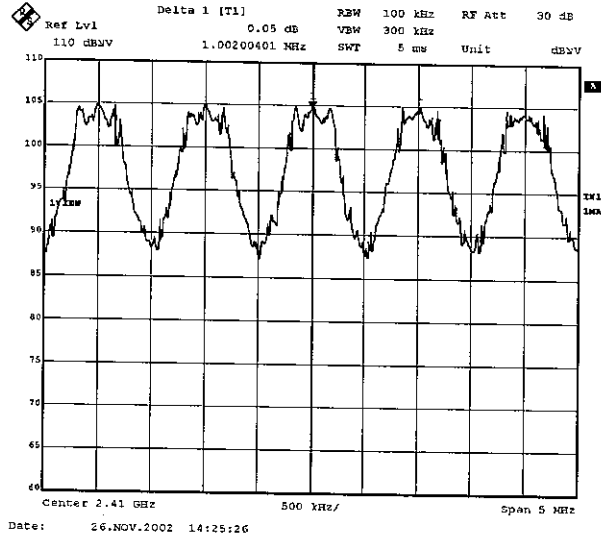
Emission Level [dB $\mu$ V]

PHASE:L1

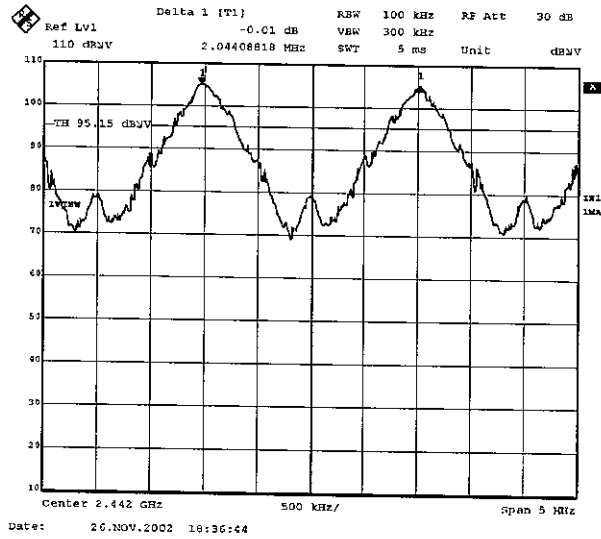




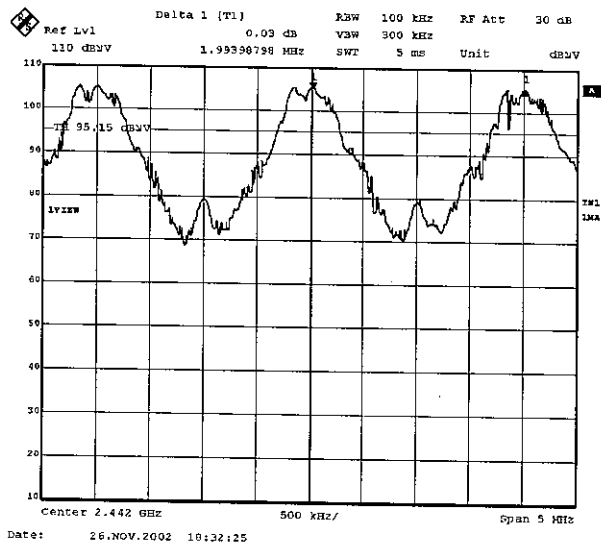
Hopping



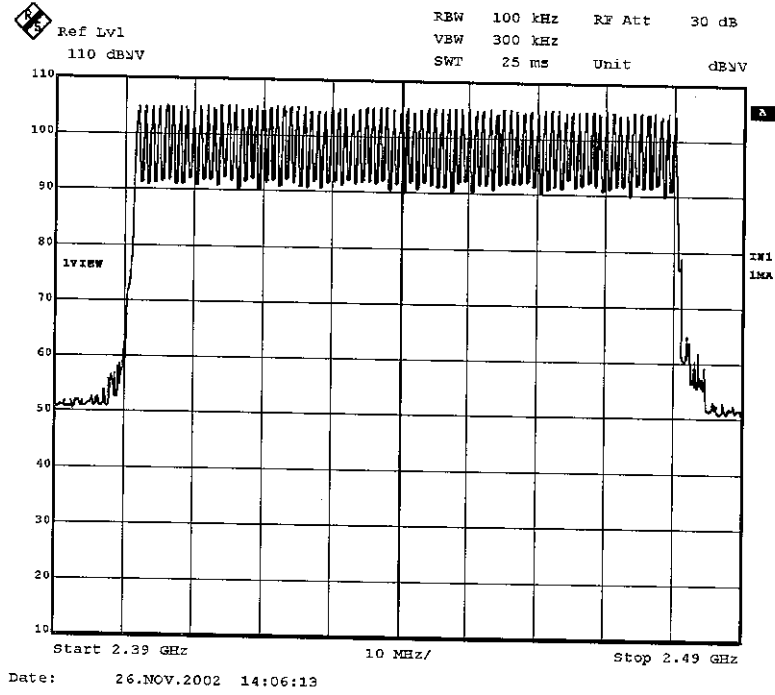
Inquiry



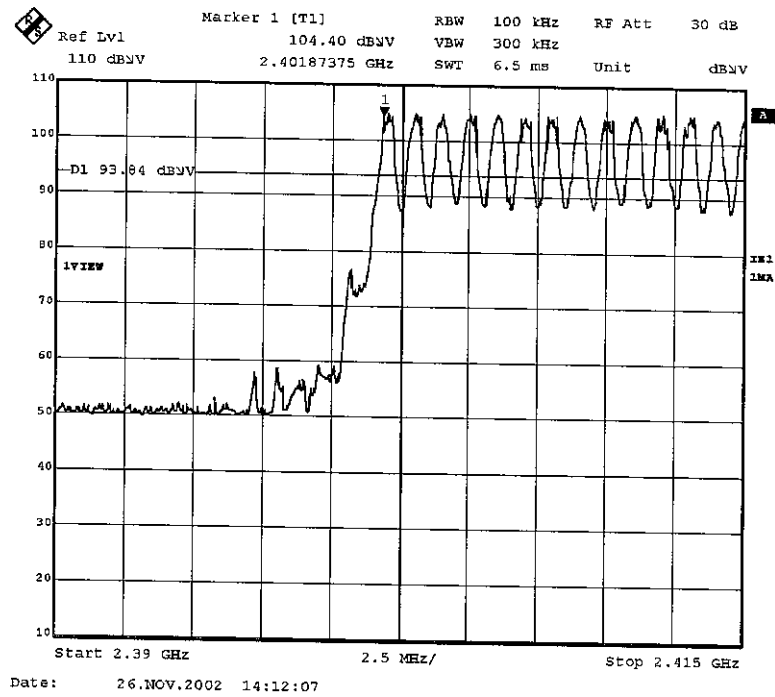
Page



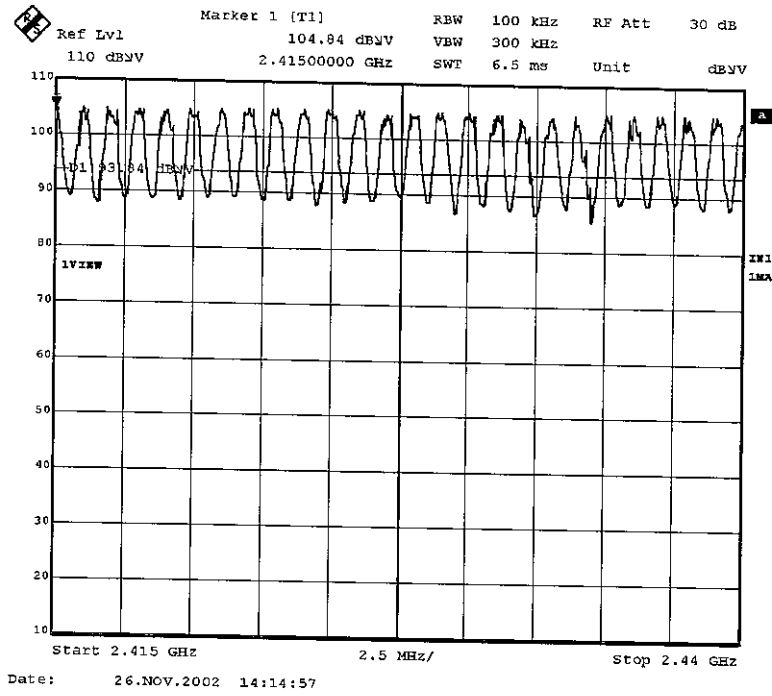
Hopping  
1.



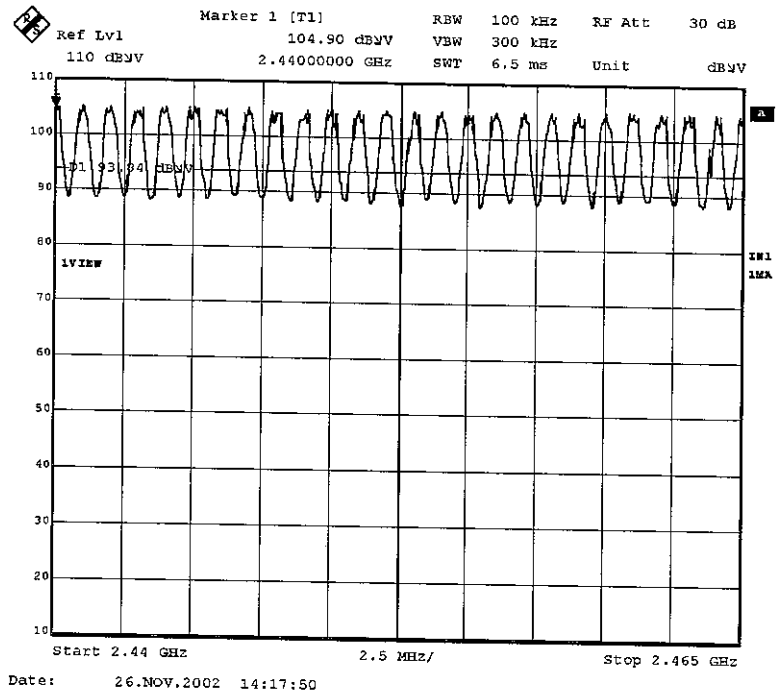
2.



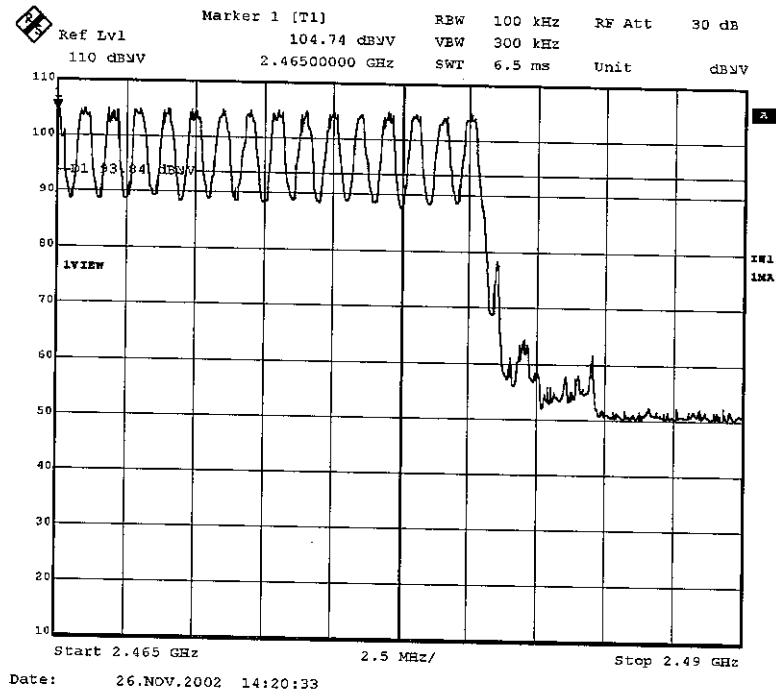
3.



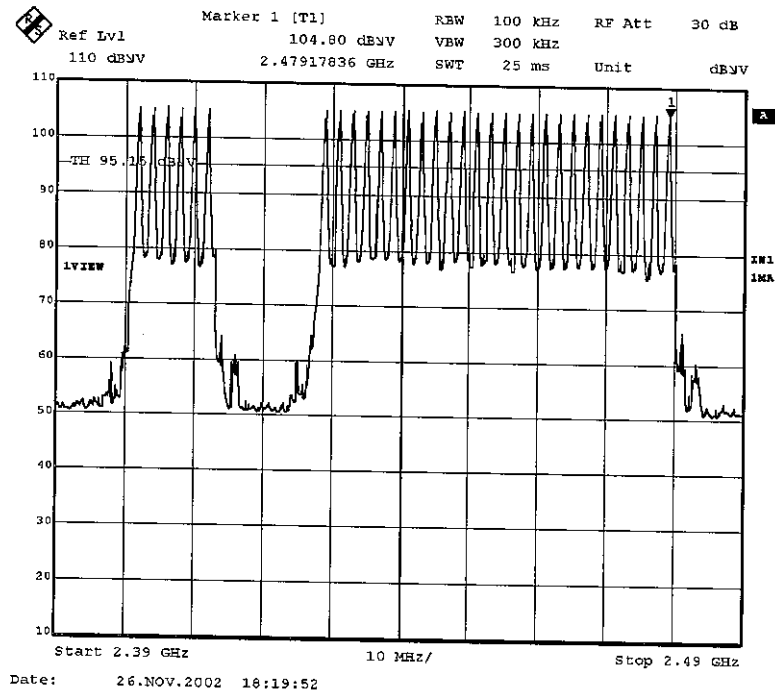
4.



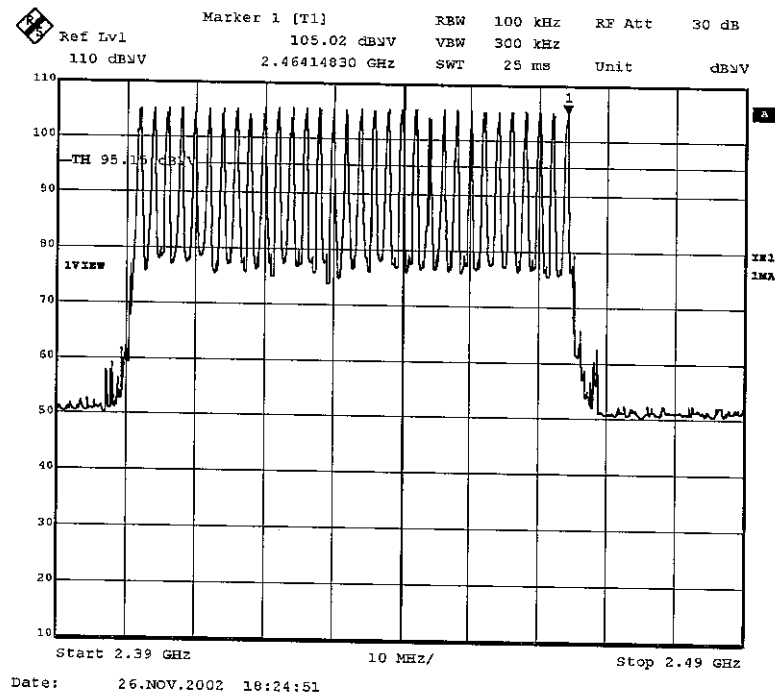
5.



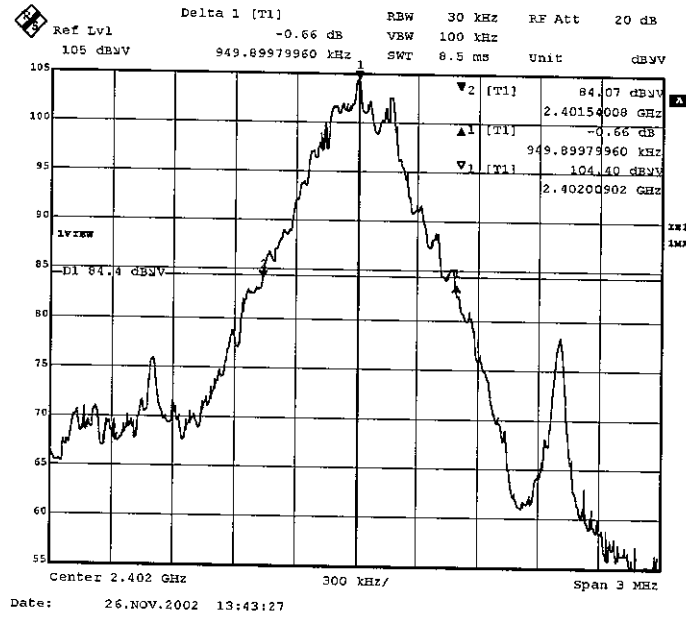
Inquiry



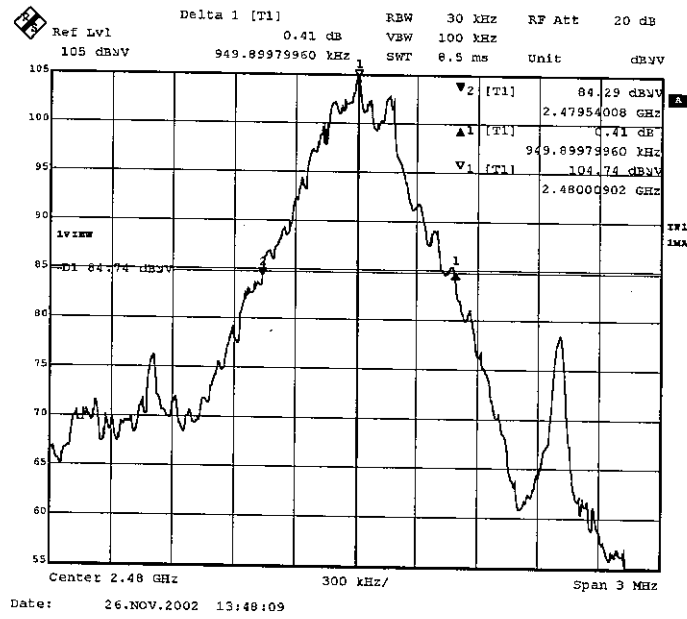
Page



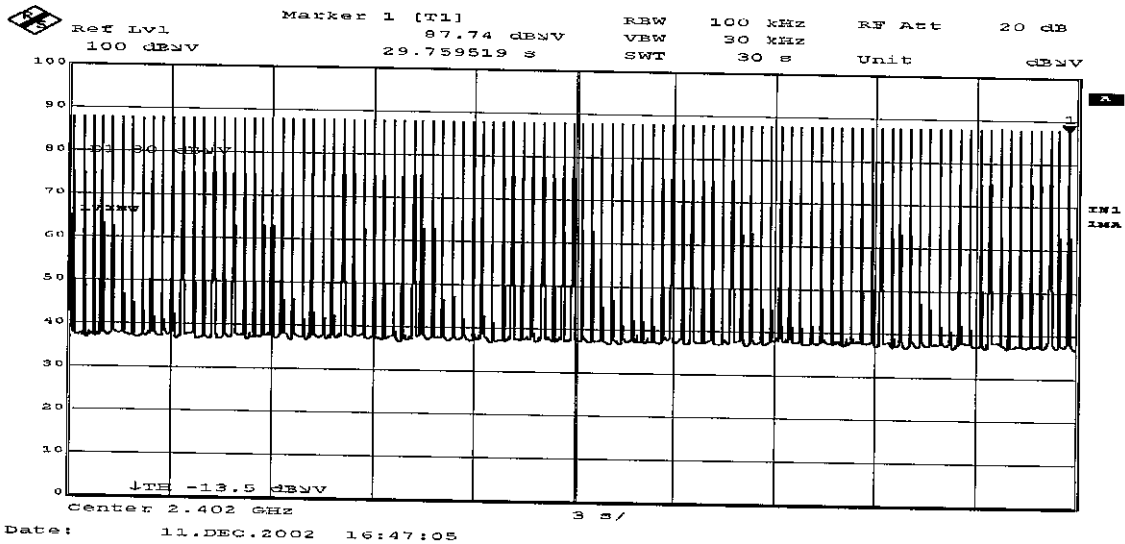
1. ch Low: 2402MHz



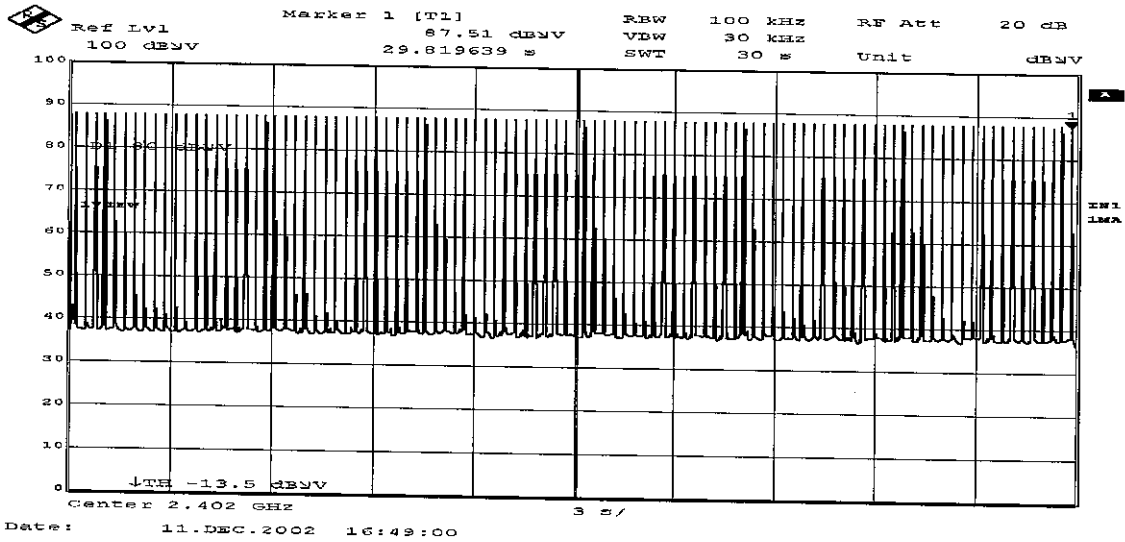
2. ch High: 2480MHz



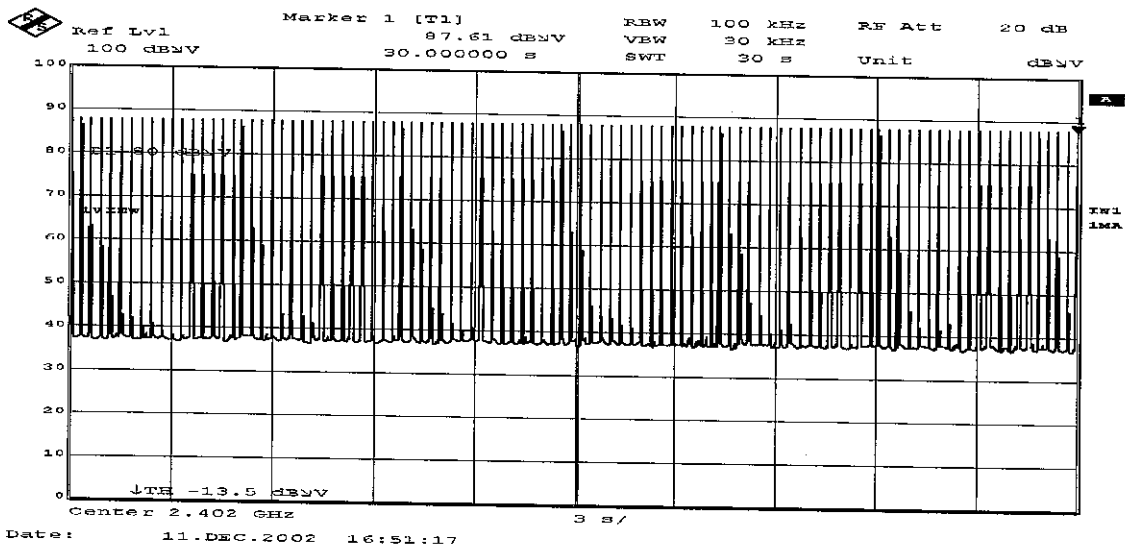
Dwell Time(Hopping)  
Count 1



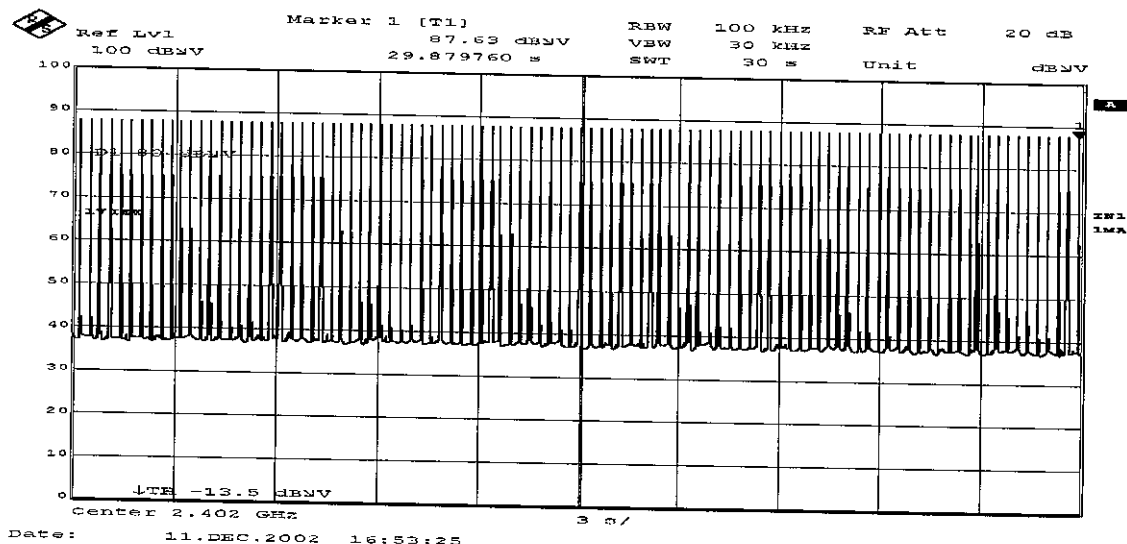
Count 2



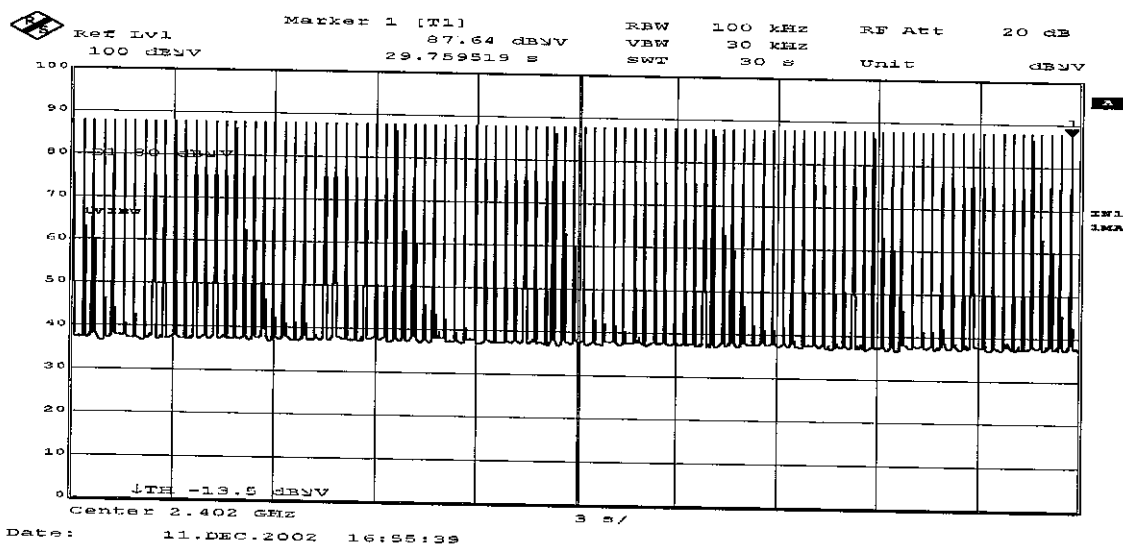
Count 3



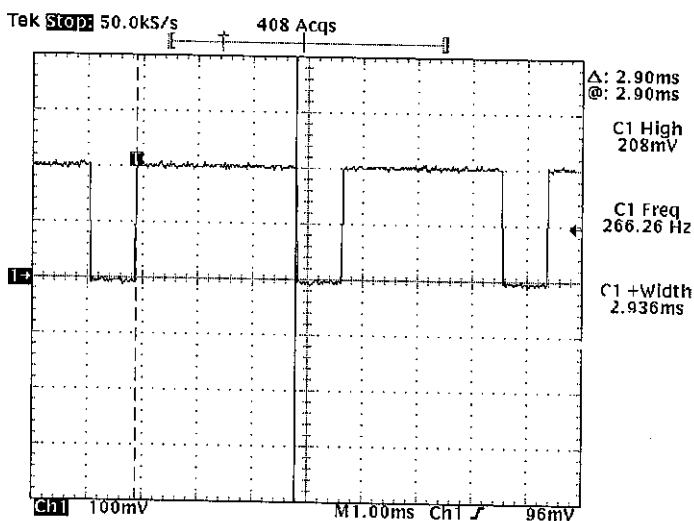
Count 4



Count 5



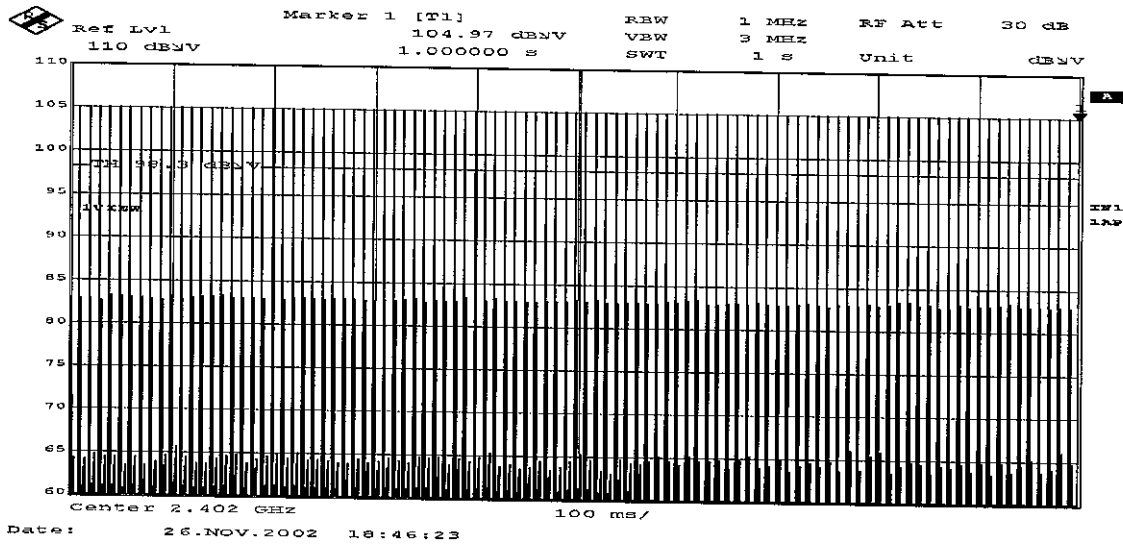
Duty cycle(Hopping)



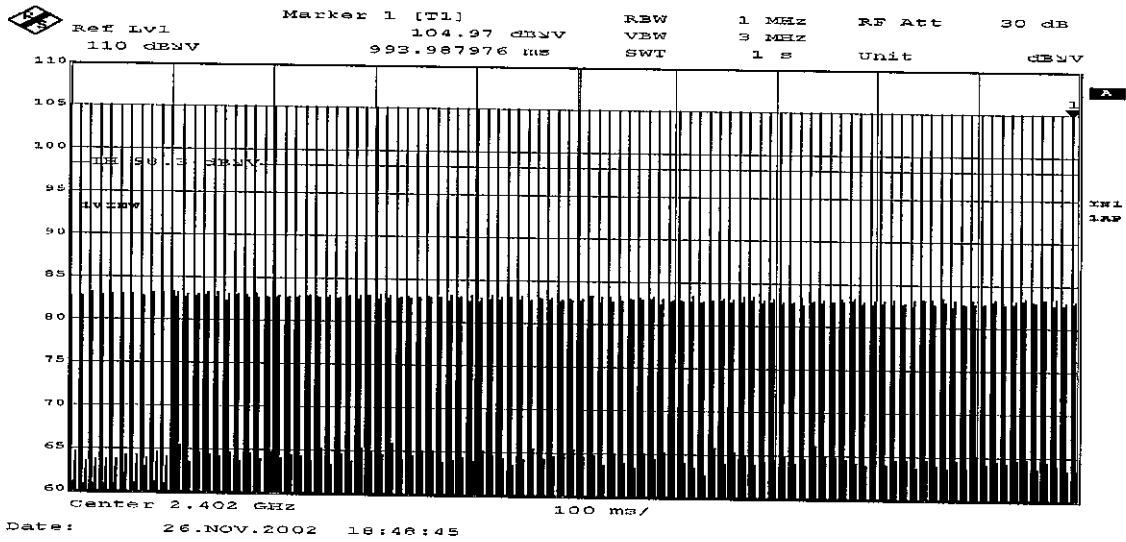
$$\begin{aligned} \text{Dwell time} &= (\text{Count 1} + \text{Count 2} + \text{Count 3} + \text{Count 4} + \text{Count 5}) / 5 * T_{on} \\ &= (102 + 102 + 102 + 101 + 101) / 5 * 2.90[\text{ms}] \\ &= 294.64 [\text{ms}] \end{aligned}$$



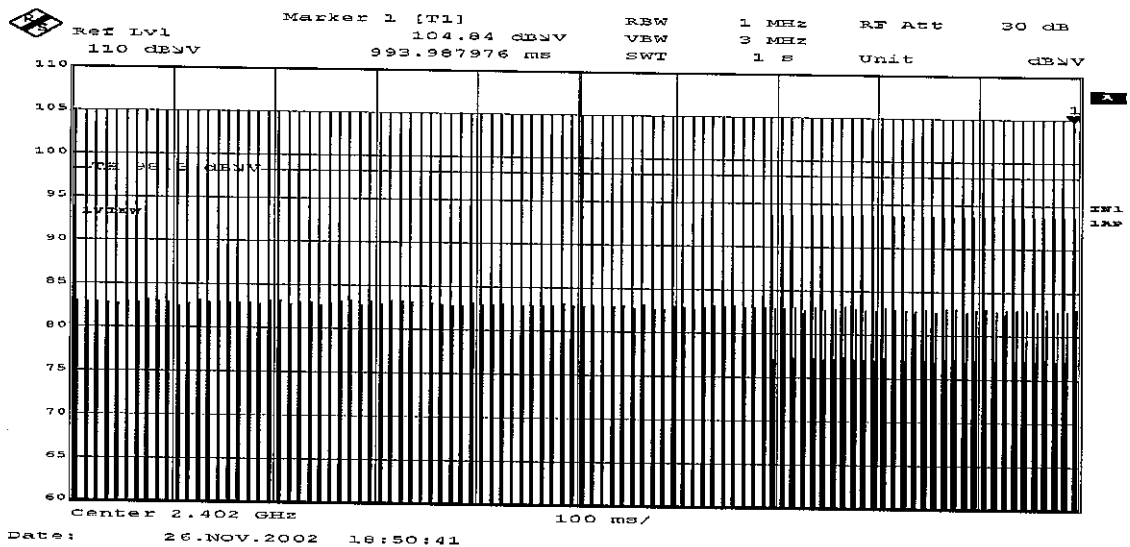
Dwell Time(Inquiry)  
Count 1



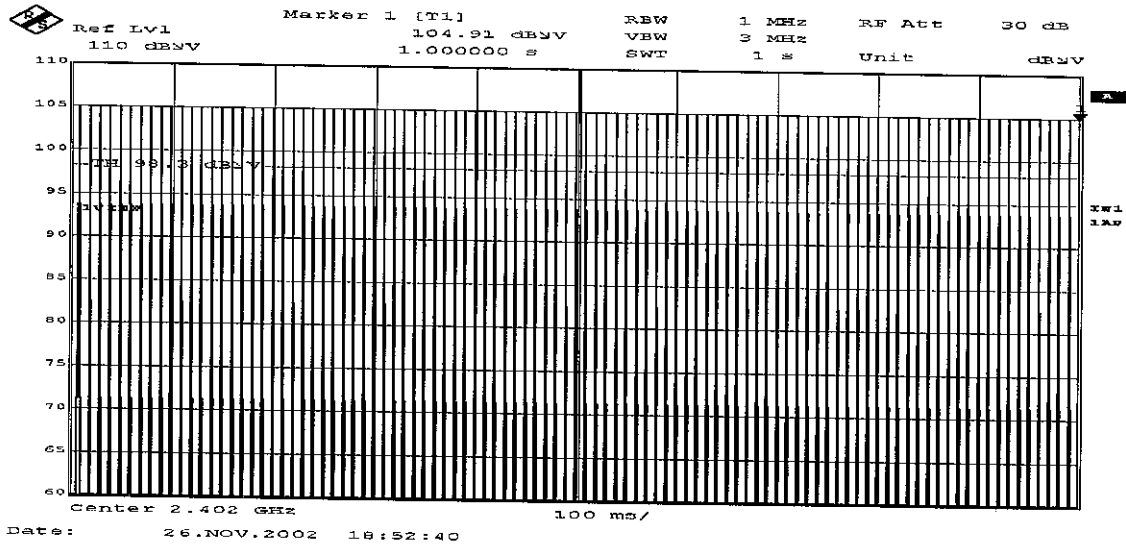
Count 2



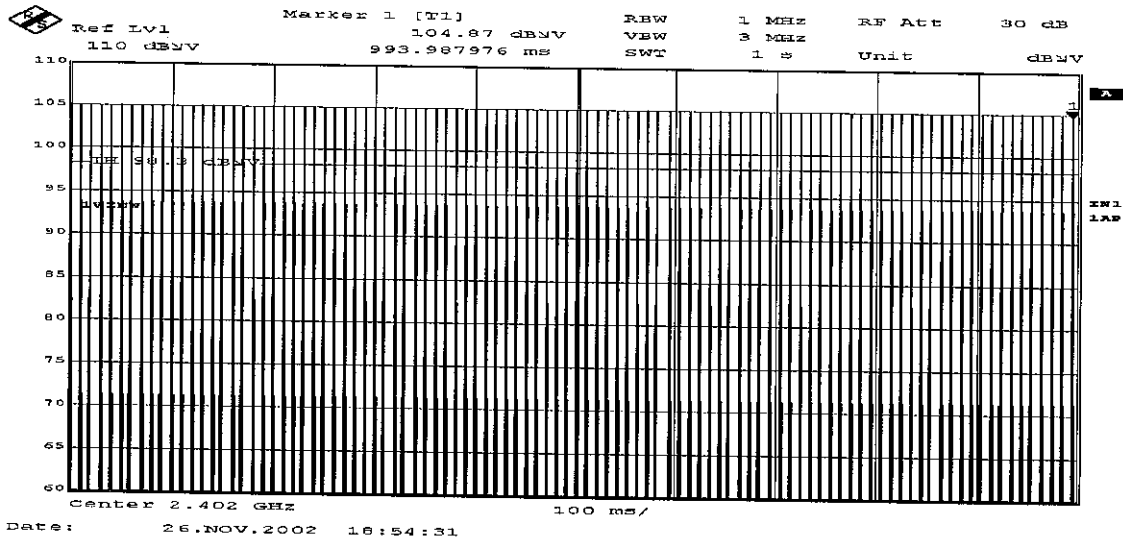
Count 3



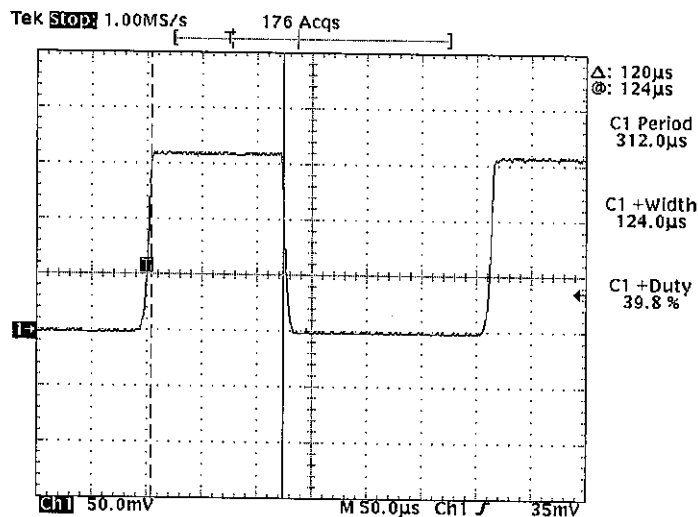
Count 4



Count 5



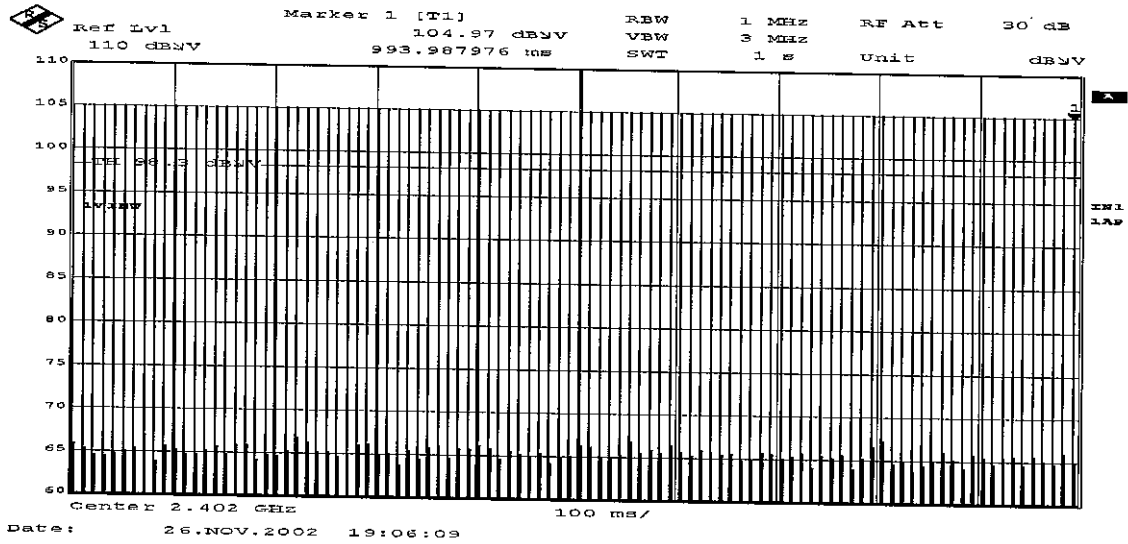
Duty cycle(Inquiry)



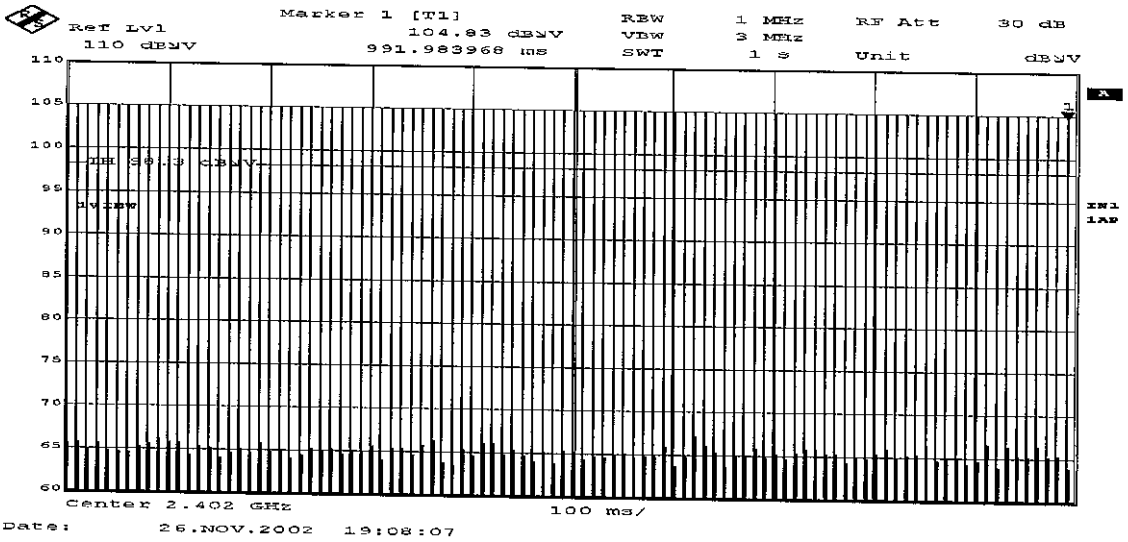
$$\begin{aligned} \text{Dwell time} &= (\text{Count 1} + \text{Count 2} + \text{Count 3} + \text{Count 4} + \text{Count 5}) / 5 * 0.4x * T_{on} \\ &= (100 + 100 + 100 + 100 + 100) / 5 * 12.8[s] * 120 [\mu s] \\ &= 153.6 [ms] \end{aligned}$$

Note.  $0.4x = 0.4 * 32ch = 12.8[s]$

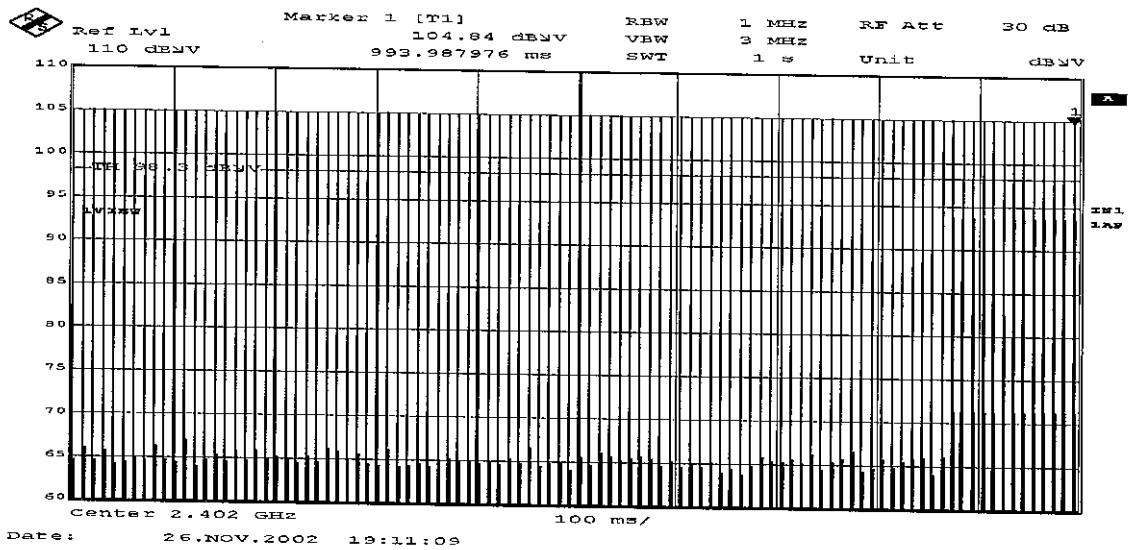
Dwell Time(Page)  
Count 1



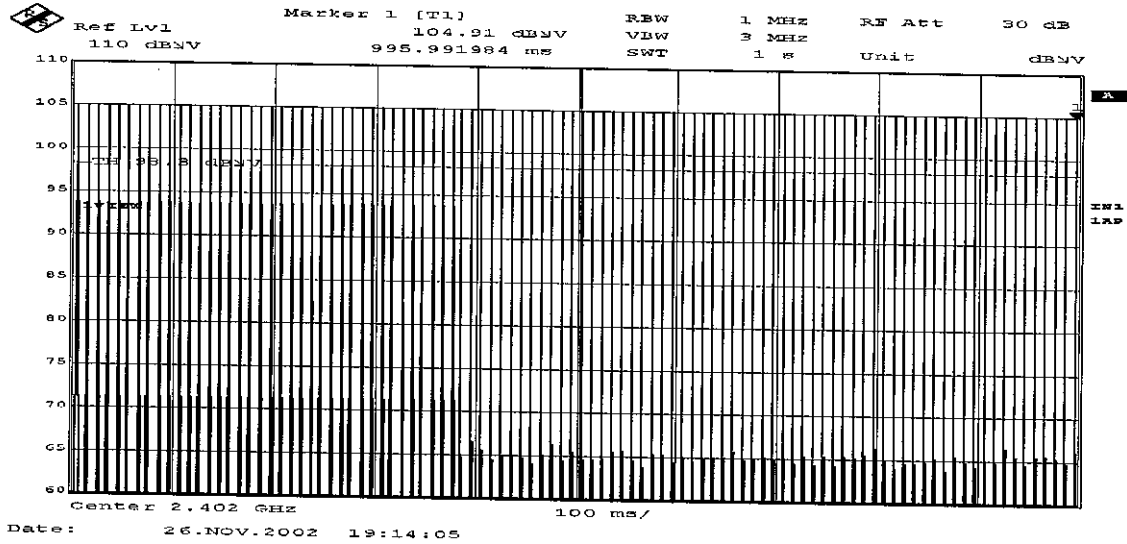
Count 2



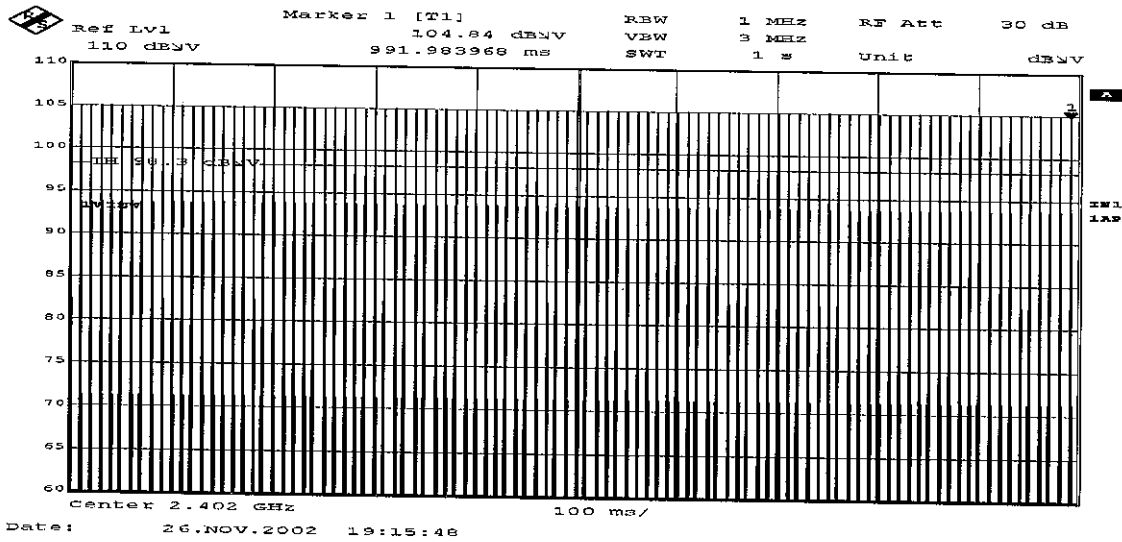
Count 3



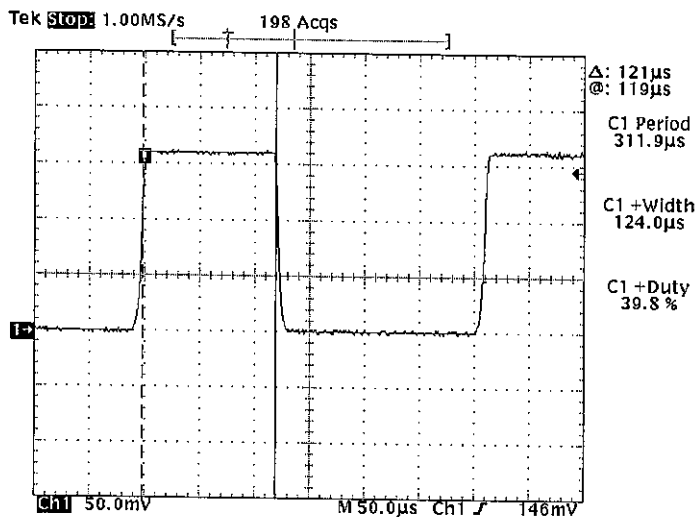
Count 4



Count 5



Duty cycle(Page)



$$\begin{aligned} \text{Dwell time} &= (\text{Count 1} + \text{Count 2} + \text{Count 3} + \text{Count 4} + \text{Count 5}) / 5 * 0.4x * T_{on} \\ &= (100 + 100 + 100 + 100 + 100) / 5 * 12.8[s] * 121 [\mu s] \\ &= 154.88 [ms] \end{aligned}$$

Note.  $0.4x = 0.4 * 32ch = 12.8[s]$

# Peak Out Put Power (Conducted)

A-PEX INTERNATIONAL CO., LTD.  
YAMAKITA NO. 1 OPEN SITE

COMPANY : Alps Electric Co Ltd.                      REPORT NO : 23DE0002-YK-1  
EQUIPMENT : Bluetooth Transceiver Module        REGULATION : Fcc Part15SubpartC 247 (b) (1)  
MODEL : UGPZ3    DATE : 2002/ 11/26  
FCC ID : CWTUGPZ3                                      Temp. /Humi. : 20°C/51%  
POWER : DC3. 3V (PC:AC120V/60Hz)  
Mode : Transmitting

  
ENGINEER : Toyokazu Imamura

CH or Mode	FREQ [GHz]	PM Reading [dBm]	Limit [dBm]	MARGIN [dB]
Low	2402.00	1.64	30.0	28.36
High	2480.00	1.62	30.0	28.38
Inquiry	-	1.97	30.0	28.03
Page	-	1.83	30.0	28.17
Hopping	-	1.89	20.96	19.07

Limit:1W=30dBm

Limit (Hopping) :125mW=20.96dBm

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: YCE-5255  
Date : 11/20/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 37 %  
Regulation : FCC Part15C § 15. 209

  
Engineer : Toyokazu Imamura

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.	66.75	BB	36.6	28.0	7.2	28.6	2.0	6.1	23.3	14.7	40.0	16.7	25.3
2.	70.93	BB	27.4	35.0	6.6	28.5	2.1	6.1	13.7	21.3	40.0	26.3	18.7
3.	250.01	BB	29.9	26.4	16.8	27.8	4.2	6.1	29.2	25.7	46.0	16.8	20.3
4.	497.84	BB	33.9	36.0	19.0	29.1	6.2	6.1	36.1	38.2	46.0	9.9	7.8
5.	500.25	BB	28.4	33.3	19.0	29.1	6.2	6.1	30.6	35.5	46.0	15.4	10.5
6.	522.25	BB	35.0	32.7	19.2	29.5	6.4	6.1	37.2	34.9	46.0	8.8	11.1
7.	528.02	BB	31.2	31.8	19.2	29.5	6.4	6.1	33.4	34.0	46.0	12.6	12.0

CALCULATION:  $READING[dB \mu V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB]$ .


■ANTENNA:KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz

■CABLE:KCC-10/11/12/13/18 ■PREAMP:KAF-01 (8447D) ■EMI RECEIVER:KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co.,Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: YCE-5255  
Date : 11/20/2002  
Test Distance : 3. m  
Temperature : 23 °C  
Humidity : 37 %  
Regulation : FCC Part15C § 15. 209

  
Engineer : Toyokazu Imamura

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.	66.75	BB	35.1	32.2	7.2	28.6	2.0	6.1	21.8	18.9	40.0	18.2	21.1
2.	70.89	BB	38.4	38.8	6.6	28.5	2.1	6.1	24.7	25.1	40.0	15.3	14.9
3.	250.01	BB	29.4	26.8	16.8	27.8	4.2	6.1	28.7	26.1	46.0	17.3	19.9
4.	497.67	BB	33.8	34.4	19.0	29.1	6.2	6.1	36.0	36.6	46.0	10.0	9.4
5.	500.34	BB	29.3	33.4	19.0	29.1	6.2	6.1	31.5	35.6	46.0	14.5	10.4
6.	522.25	BB	36.9	32.8	19.2	29.5	6.4	6.1	39.1	35.0	46.0	6.9	11.0
7.	528.06	BB	29.8	31.0	19.2	29.5	6.4	6.1	32.0	33.2	46.0	14.0	12.8

CALCULATION:  $READING[dB \mu V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB]$ .

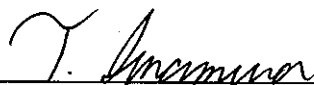
■ ANTENNA: KBA-01 (BBA9106) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz

■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: YCE-5255  
Date : 11/21/2002  
Test Distance : 3 m  
Temperature : 26 °C  
Humidity : 32 %  
Regulation : FCC Part15C § 15. 209 (AV Detection)

  
\_\_\_\_\_  
Engineer : Toyokazu Imamura

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	36.1	36.9	30.6	36.7	2.4	0.0	32.4	33.2	54.0	21.6	20.8
2.	4804.00	BB	33.8	42.4	34.6	37.1	3.5	0.0	34.8	43.4	54.0	19.2	10.6
3.	7206.00	BB	32.2	32.3	37.6	37.0	4.2	0.0	37.0	37.1	54.0	17.0	16.9
4.	9608.00	BB	32.1	32.1	39.0	37.0	5.2	0.0	39.3	39.3	54.0	14.7	14.7
5.	12010.00	BB	32.3	32.4	42.0	36.1	5.6	0.0	43.8	43.9	54.0	10.2	10.1
6.	14412.00	BB	31.5	31.6	41.1	35.1	6.3	0.0	43.8	43.9	54.0	10.2	10.1
7.	16814.00	BB	32.0	32.1	41.6	34.9	6.5	0.0	45.2	45.3	54.0	8.8	8.7
8.	19216.00	BB	32.0	32.4	41.3	34.8	7.2	0.0	45.7	46.1	54.0	8.3	7.9
9.	21618.00	BB	32.3	32.8	41.3	34.9	7.5	0.0	46.2	46.7	54.0	7.8	7.3
10.	24020.00	BB	31.9	32.2	40.5	34.6	8.1	0.0	45.9	46.2	54.0	8.1	7.8

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].


■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)



# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: YCE-5255  
Date : 11/21/2002  
Test Distance : 3 m  
Temperature : 26 °C  
Humidity : 32 %  
Regulation : FCC Part15C §15. 209 (AV Detection)

  
Engineer : Toyokazu Imamura

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	50.3	50.1	30.6	36.7	2.4	0.0	46.6	46.4	54.0	7.4	7.6
2.	2484.06	BB	50.7	50.8	30.6	36.7	2.4	0.0	47.0	47.1	54.0	7.0	6.9
3.	4960.00	BB	39.1	43.4	35.6	36.8	3.5	0.0	41.4	45.7	54.0	12.6	8.3
4.	7440.00	BB	32.1	32.1	38.0	36.9	4.3	0.0	37.5	37.5	54.0	16.5	16.5
5.	9920.00	BB	32.3	32.3	39.0	36.8	5.4	0.0	39.9	39.9	54.0	14.1	14.1
6.	12400.00	BB	31.4	31.3	42.6	35.6	5.7	0.0	44.1	44.0	54.0	9.9	10.0
7.	14880.00	BB	32.5	32.5	42.6	35.5	6.5	0.0	46.1	46.1	54.0	7.9	7.9
8.	17360.00	BB	32.3	32.4	42.7	34.9	6.7	0.0	46.8	46.9	54.0	7.2	7.1
9.	19840.00	BB	32.0	32.2	40.9	35.3	7.5	0.0	45.1	45.3	54.0	8.9	8.7
10.	22320.00	BB	33.1	33.1	41.4	35.3	7.2	0.0	46.4	46.4	54.0	7.6	7.6
11.	24800.00	BB	32.0	32.1	40.8	34.2	8.3	0.0	46.9	47.0	54.0	7.1	7.0

CALCULATION:  $READING [dB \mu V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]$ .

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC: AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: YCE-5255  
Date : 11/21/2002  
Test Distance : 3 m  
Temperature : 26 °C  
Humidity : 32 %  
Regulation : FCC Part15C § 15.209 (PK Detection)

  
Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER					HOR [dB μV/m]	VER		HOR [dB]	VER
1.	2390.00	BB	49.4	50.5	30.6	36.7	2.4	0.0	45.7	46.8	74.0	28.3	27.2
2.	4804.00	BB	47.4	49.7	34.6	37.1	3.5	0.0	48.4	50.7	74.0	25.6	23.3
3.	7206.00	BB	44.8	45.2	37.6	37.0	4.2	0.0	49.6	50.0	74.0	24.4	24.0
4.	9608.00	BB	44.4	44.8	39.0	37.0	5.2	0.0	51.6	52.0	74.0	22.4	22.0
5.	12010.00	BB	45.2	44.9	42.0	36.1	5.6	0.0	56.7	56.4	74.0	17.3	17.6
6.	14412.00	BB	44.2	44.4	41.1	35.1	6.3	0.0	56.5	56.7	74.0	17.5	17.3
7.	16814.00	BB	44.7	44.7	41.6	34.9	6.5	0.0	57.9	57.9	74.0	16.1	16.1
8.	19216.00	BB	44.7	45.5	41.3	34.8	7.2	0.0	58.4	59.2	74.0	15.6	14.8
9.	21618.00	BB	45.4	45.6	41.3	34.9	7.5	0.0	59.3	59.5	74.0	14.7	14.5
10.	24020.00	BB	44.4	45.2	40.5	34.6	8.1	0.0	58.4	59.2	74.0	15.6	14.8


CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co.,Ltd  
 Kind of Equipment : Bluetooth Transceiver module  
 Model No. : UPGZ3  
 Serial No. : 11  
 Power : DC3. 3V (PC: AC120V/60Hz)  
 Mode : Transmitting (2480MHz)  
 Remarks : Tx Antenna Type: YCE-5255  
 Date : 11/21/2002  
 Test Distance : 3 m  
 Temperature : 26 °C  
 Humidity : 32 %  
 Regulation : FCC Part15C § 15. 209 (PK Detection)

  
 Engineer : Toyokazu Imamura

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	62.8	62.3	30.6	36.7	2.4	0.0	59.1	58.6	74.0	14.9	15.4
2.	2484.06	BB	62.9	62.5	30.6	36.7	2.4	0.0	59.2	58.8	74.0	14.8	15.2
3.	4960.00	BB	47.8	50.7	35.6	36.8	3.5	0.0	50.1	53.0	74.0	23.9	21.0
4.	7440.00	BB	44.7	44.4	38.0	36.9	4.3	0.0	50.1	49.8	74.0	23.9	24.2
5.	9920.00	BB	45.6	45.2	39.0	36.8	5.4	0.0	53.2	52.8	74.0	20.8	21.2
6.	12400.00	BB	44.4	44.2	42.6	35.6	5.7	0.0	57.1	56.9	74.0	16.9	17.1
7.	14880.00	BB	45.2	45.1	42.6	35.5	6.5	0.0	58.8	58.7	74.0	15.2	15.3
8.	17360.00	BB	44.8	45.5	42.7	34.9	6.7	0.0	59.3	60.0	74.0	14.7	14.0
9.	19840.00	BB	44.6	45.2	40.9	35.3	7.5	0.0	57.7	58.3	74.0	16.3	15.7
10.	22320.00	BB	45.8	45.6	41.4	35.3	7.2	0.0	59.1	58.9	74.0	14.9	15.1
11.	24800.00	BB	44.7	44.7	40.8	34.2	8.3	0.0	59.6	59.6	74.0	14.4	14.4

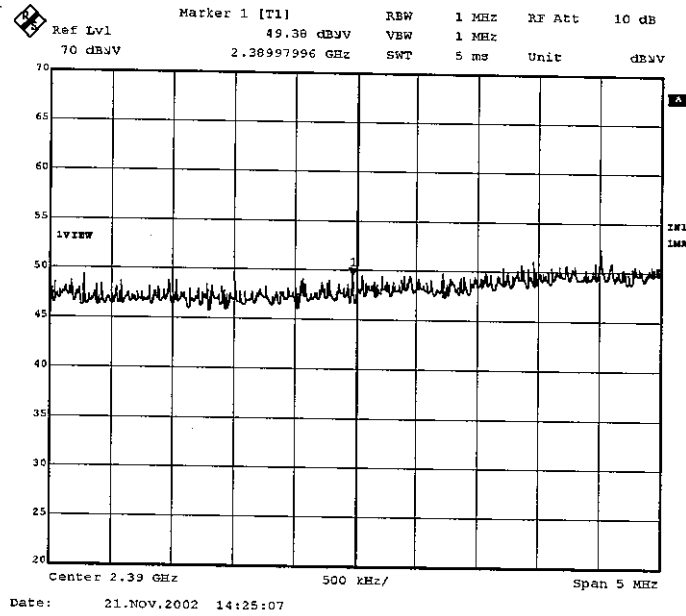
CALCULATION:  $READING [dB \mu V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]$ .

- ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz
- CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

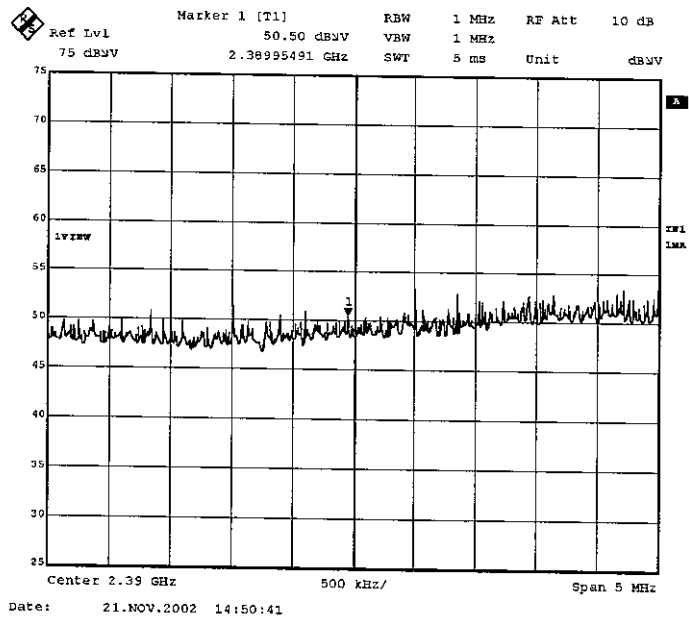
Antenna Type: YCE-5255

2.39GHz (Ch :2402MHz)

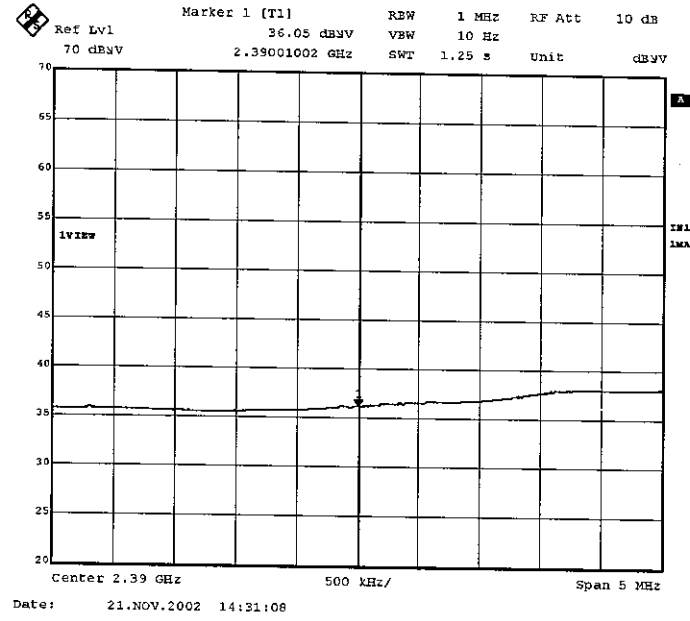
1. Horizontal/PK



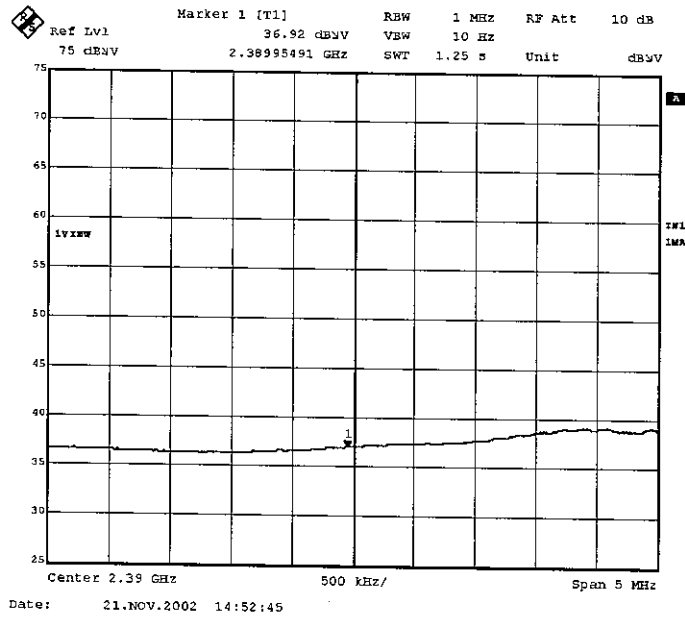
2. Vertical/PK



3. Horizontal/AV

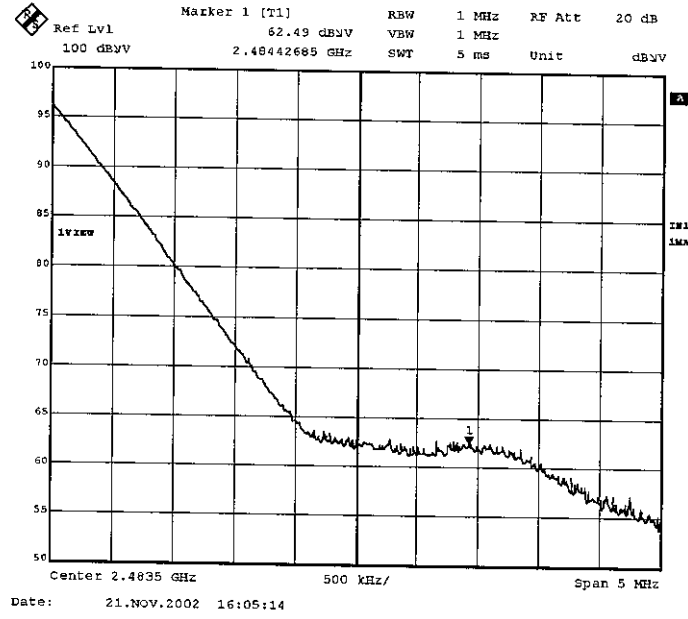


4. Vertical/AV

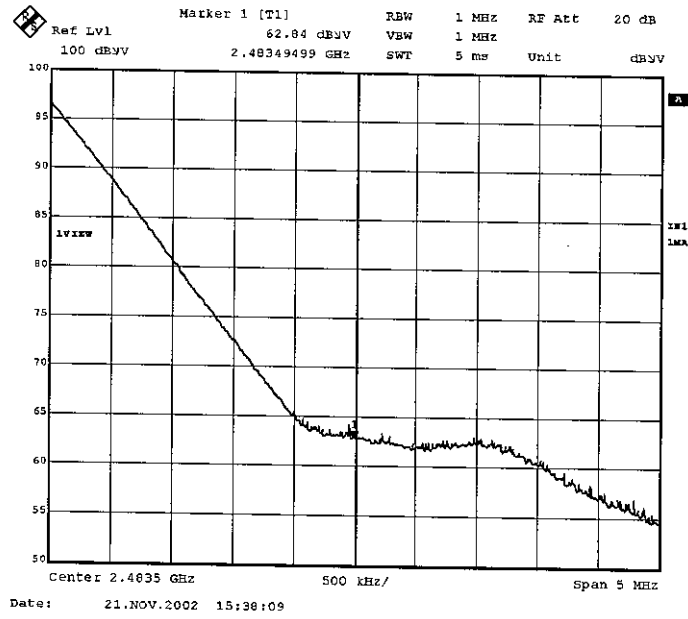


2.4835GHz (Ch :2480MHz)

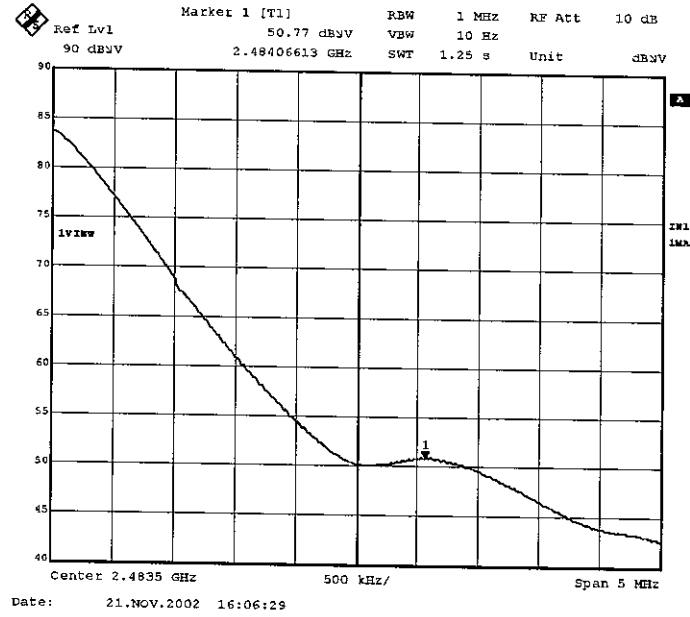
1. Horizontal/PK



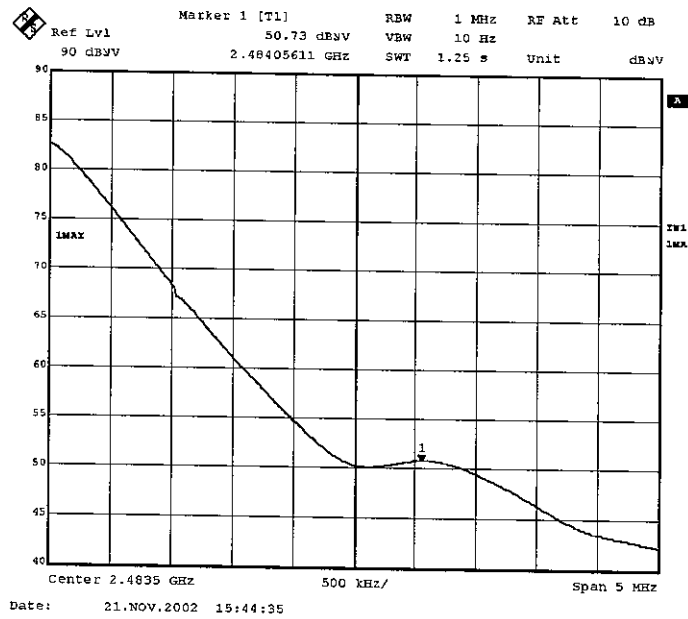
2. Vertical/PK



3. Horizontal/ AV




4. Vertical/ AV



# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co.,Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/20/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 37 %  
Regulation : FCC Part15C § 15. 209

  
Engineer : Toyokazu Imamura

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.	66.75	BB	33.4	30.8	7.2	28.6	2.0	6.1	20.1	17.5	40.0	19.9	22.5
2.	70.89	BB	38.9	39.4	6.6	28.5	2.1	6.1	25.2	25.7	40.0	14.8	14.3
3.	250.01	BB	29.1	26.9	16.8	27.8	4.2	6.1	28.4	26.2	46.0	17.6	19.8
4.	497.67	BB	33.8	34.7	19.0	29.1	6.2	6.1	36.0	36.9	46.0	10.0	9.1
5.	500.43	BB	30.7	31.8	19.0	29.1	6.2	6.1	32.9	34.0	46.0	13.1	12.0
6.	522.24	BB	37.7	33.4	19.2	29.5	6.4	6.1	39.9	35.6	46.0	6.1	10.4
7.	528.03	BB	29.3	29.3	19.2	29.5	6.4	6.1	31.5	31.5	46.0	14.5	14.5

CALCULATION:  $READING [dB \mu V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]$ .

■ ANTENNA: KBA-01 (BBA9106) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz

■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)



# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/20/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 37 %  
Regulation : FCC Part15C § 15. 209

  
Engineer : Toyokazu Imamura

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.	66.75	BB	29.8	31.7	7.2	28.6	2.0	6.1	16.5	18.4	40.0	23.5	21.6
2.	71.00	BB	40.1	35.2	6.6	28.5	2.1	6.1	26.4	21.5	40.0	13.6	18.5
3.	250.02	BB	29.0	26.4	16.8	27.8	4.2	6.1	28.3	25.7	46.0	17.7	20.3
4.	497.80	BB	35.6	37.4	19.0	29.1	6.2	6.1	37.8	39.6	46.0	8.2	6.4
5.	500.23	BB	29.3	32.0	19.0	29.1	6.2	6.1	31.5	34.2	46.0	14.5	11.8
6.	522.26	BB	36.8	32.6	19.2	29.5	6.4	6.1	39.0	34.8	46.0	7.0	11.2
7.	528.06	BB	29.3	30.0	19.2	29.5	6.4	6.1	31.5	32.2	46.0	14.5	13.8

CALCULATION:  $READING [dB \mu V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]$ .

■ ANTENNA: KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz  
■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/22/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 36 %  
Regulation : FCC Part15C § 15. 209 (AV Detection)

  
\_\_\_\_\_  
Engineer : Toyokazu Imamura

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	36.5	37.0	30.6	36.7	2.4	0.0	32.8	33.3	54.0	21.2	20.7
2.	4804.00	BB	46.5	44.6	34.6	37.1	3.5	0.0	47.5	45.6	54.0	6.5	8.4
3.	7206.00	BB	32.5	32.4	37.6	37.0	4.2	0.0	37.3	37.2	54.0	16.7	16.8
4.	9608.00	BB	32.4	32.3	39.0	37.0	5.2	0.0	39.6	39.5	54.0	14.4	14.5
5.	12010.00	BB	32.5	32.6	42.0	36.1	5.6	0.0	44.0	44.1	54.0	10.0	9.9
6.	14412.00	BB	31.7	31.8	41.1	35.1	6.3	0.0	44.0	44.1	54.0	10.0	9.9
7.	16814.00	BB	32.2	32.3	41.6	34.9	6.5	0.0	45.4	45.5	54.0	8.6	8.5
8.	19216.00	BB	32.3	33.0	41.3	34.8	7.2	0.0	46.0	46.7	54.0	8.0	7.3
9.	21618.00	BB	32.9	33.2	41.3	34.9	7.5	0.0	46.8	47.1	54.0	7.2	6.9
10.	24020.00	BB	32.8	32.7	40.5	34.6	8.1	0.0	46.8	46.7	54.0	7.2	7.3

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/22/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 36 %  
Regulation : FCC Part15C § 15. 209 (AV Detection)

  
Engineer : Toyokazu Imamura

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	51.2	50.9	30.6	36.7	2.4	0.0	47.5	47.2	54.0	6.5	6.8
2.	2484.10	BB	51.7	51.6	30.6	36.7	2.4	0.0	48.0	47.9	54.0	6.0	6.1
3.	4960.00	BB	45.0	43.3	35.6	36.8	3.5	0.0	47.3	45.6	54.0	6.7	8.4
4.	7440.00	BB	32.1	32.2	38.0	36.9	4.3	0.0	37.5	37.6	54.0	16.5	16.4
5.	9920.00	BB	32.6	32.9	39.0	36.8	5.4	0.0	40.2	40.5	54.0	13.8	13.5
6.	12400.00	BB	31.5	31.6	42.6	35.6	5.7	0.0	44.2	44.3	54.0	9.8	9.7
7.	14880.00	BB	32.6	32.7	42.6	35.5	6.5	0.0	46.2	46.3	54.0	7.8	7.7
8.	17360.00	BB	32.6	32.9	42.7	34.9	6.7	0.0	47.1	47.4	54.0	6.9	6.6
9.	19840.00	BB	32.1	32.2	40.9	35.3	7.5	0.0	45.2	45.3	54.0	8.8	8.7
10.	22320.00	BB	33.7	33.8	41.4	35.3	7.2	0.0	47.0	47.1	54.0	7.0	6.9
11.	24800.00	BB	33.1	32.9	40.8	34.2	8.3	0.0	48.0	47.8	54.0	6.0	6.2

CALCULATION:  $READING [dB \mu V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]$ .

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/22/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 36 %  
Regulation : FCC Part15C § 15. 209 (PK Detection)

  
Engineer : Toyokazu Imamura

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	47.3	48.8	30.6	36.7	2.4	0.0	43.6	45.1	74.0	30.4	28.9
2.	4804.00	BB	53.5	52.8	34.6	37.1	3.5	0.0	54.5	53.8	74.0	19.5	20.2
3.	7206.00	BB	44.8	45.3	37.6	37.0	4.2	0.0	49.6	50.1	74.0	24.4	23.9
4.	9608.00	BB	45.4	44.7	39.0	37.0	5.2	0.0	52.6	51.9	74.0	21.4	22.1
5.	12010.00	BB	45.0	45.4	42.0	36.1	5.6	0.0	56.5	56.9	74.0	17.5	17.1
6.	14412.00	BB	44.7	44.3	41.1	35.1	6.3	0.0	57.0	56.6	74.0	17.0	17.4
7.	16814.00	BB	45.2	45.5	41.6	34.9	6.5	0.0	58.4	58.7	74.0	15.6	15.3
8.	19216.00	BB	45.1	45.1	41.3	34.8	7.2	0.0	58.8	58.8	74.0	15.2	15.2
9.	21618.00	BB	46.3	46.1	41.3	34.9	7.5	0.0	60.2	60.0	74.0	13.8	14.0
10.	24020.00	BB	45.8	45.5	40.5	34.6	8.1	0.0	59.8	59.5	74.0	14.2	14.5


CALCULATION:  $READING [dB \mu V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]$ .

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co.,Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3. 3V (PC: AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: SSW2400  
Date : 11/22/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 36 %  
Regulation : FCC Part15C § 15. 209 (PK Detection)

  
Engineer : Toyokazu Imamura

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	63.1	63.9	30.6	36.7	2.4	0.0	59.4	60.2	74.0	14.6	13.8
2.	2484.10	BB	62.7	61.9	30.6	36.7	2.4	0.0	59.0	58.2	74.0	15.0	15.8
3.	4960.00	BB	52.1	50.7	35.6	36.8	3.5	0.0	54.4	53.0	74.0	19.6	21.0
4.	7440.00	BB	44.6	44.8	38.0	36.9	4.3	0.0	50.0	50.2	74.0	24.0	23.8
5.	9920.00	BB	45.2	45.6	39.0	36.8	5.4	0.0	52.8	53.2	74.0	21.2	20.8
6.	12400.00	BB	44.6	44.2	42.6	35.6	5.7	0.0	57.3	56.9	74.0	16.7	17.1
7.	14880.00	BB	45.2	46.2	42.6	35.5	6.5	0.0	58.8	59.8	74.0	15.2	14.2
8.	17360.00	BB	45.6	45.5	42.7	34.9	6.7	0.0	60.1	60.0	74.0	13.9	14.0
9.	19840.00	BB	44.6	45.4	40.9	35.3	7.5	0.0	57.7	58.5	74.0	16.3	15.5
10.	22320.00	BB	46.5	46.3	41.4	35.3	7.2	0.0	59.8	59.6	74.0	14.2	14.4
11.	24800.00	BB	46.3	46.5	40.8	34.2	8.3	0.0	61.2	61.4	74.0	12.8	12.6

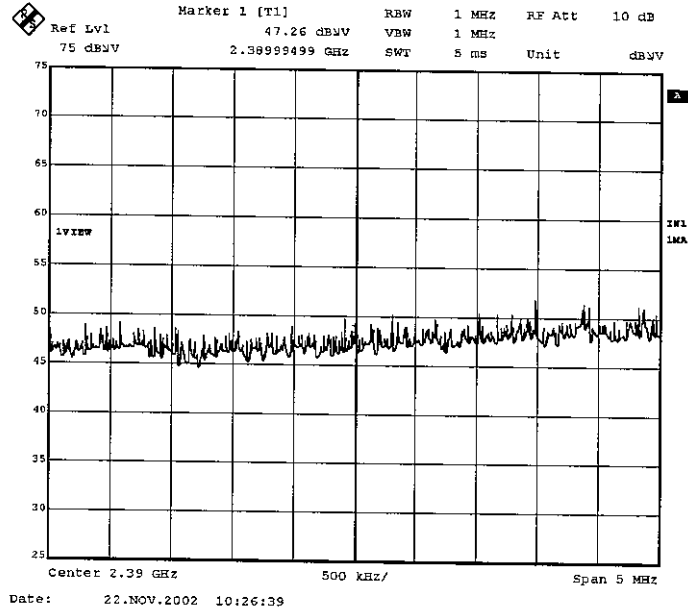
CALCULATION:  $READING[dB \mu V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB]$ .

■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26.5GHz  
■CABLE:KCC-D3 ■PREAMP:KAF-02 (8449B) ■EMI RECEIVER:KTR-01 (ES140)

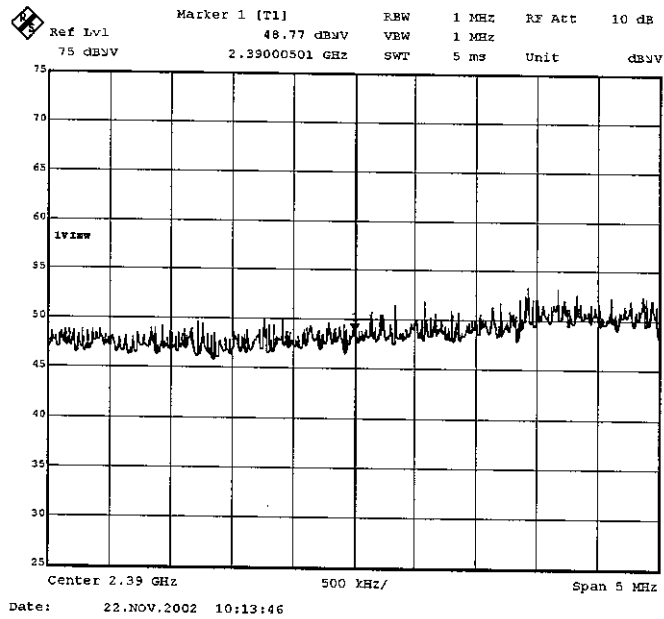
Antenna Type:SSW2400

2.39GHz (Ch :2402MHz)

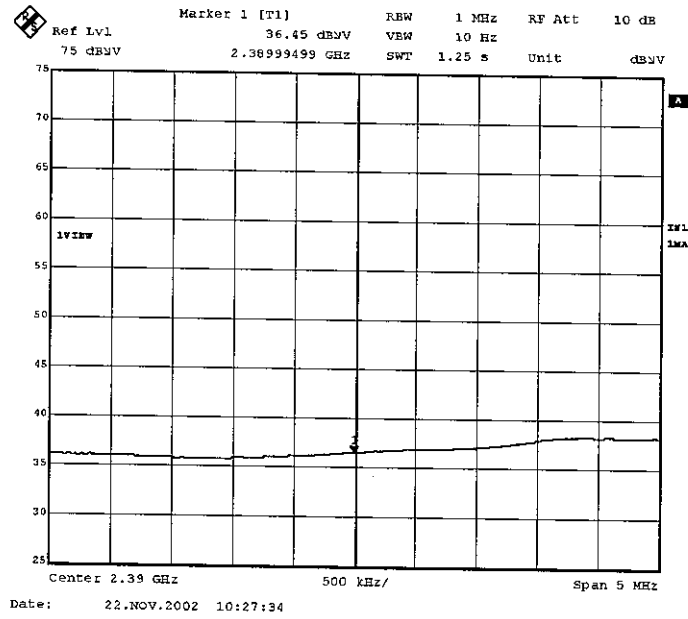
1. Horizontal/PK



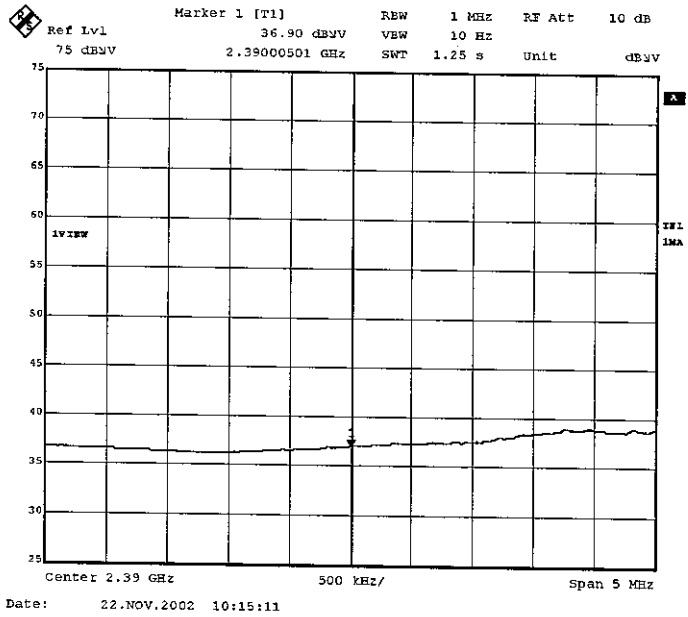
2. Vertical/PK



3. Horizontal/AV

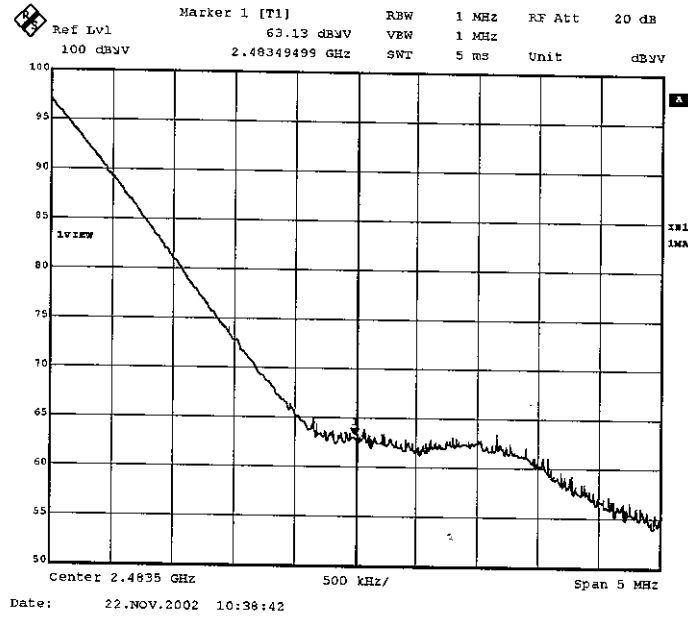


4. Vertical/AV

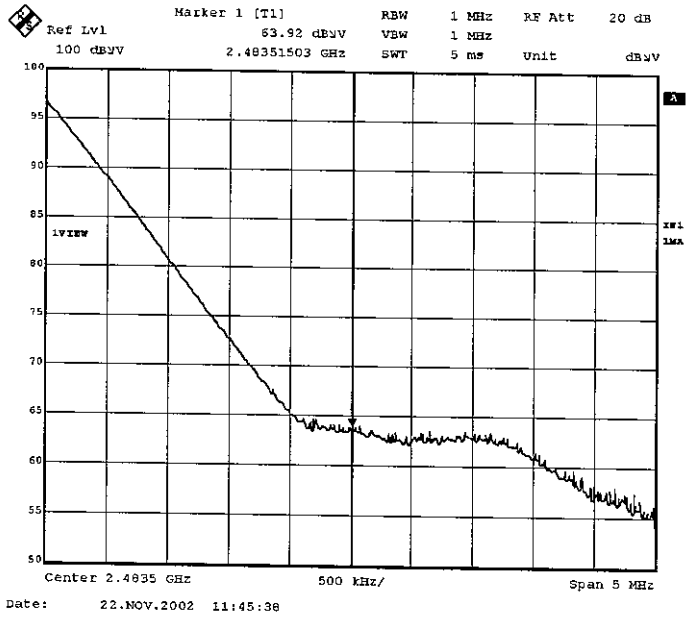


2.4835GHz (Ch :2480MHz)

1. Horizontal/PK

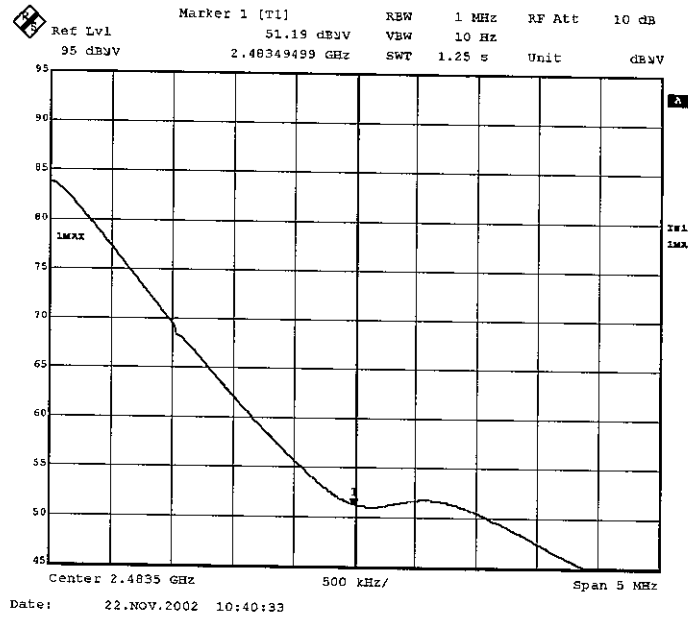


2. Vertical/PK

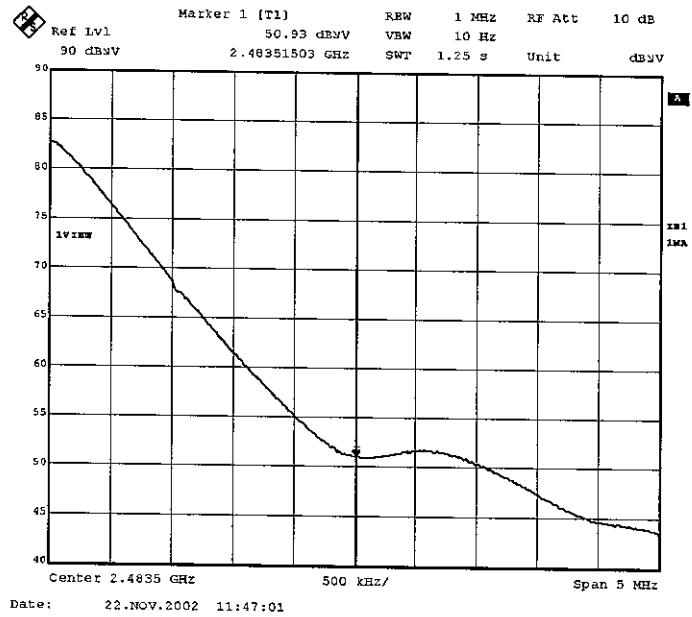




3. Horizontal/AV



4. Vertical/AV



# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: LDA92  
Date : 11/20/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 37 %  
Regulation : FCC Part15C § 15.209

  
Engineer : Toyokazu Imamura

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.	66.68	BB	34.0	31.0	7.2	28.6	2.0	6.1	20.7	17.7	40.0	19.3	22.3	
2.	71.00	BB	35.2	36.2	6.6	28.5	2.1	6.1	21.5	22.5	40.0	18.5	17.5	
3.	250.01	BB	29.1	26.4	16.8	27.8	4.2	6.1	28.4	25.7	46.0	17.6	20.3	
4.	497.67	BB	36.3	36.5	19.0	29.1	6.2	6.1	38.5	38.7	46.0	7.5	7.3	
5.	500.32	BB	30.2	31.9	19.0	29.1	6.2	6.1	32.4	34.1	46.0	13.6	11.9	
6.	522.23	BB	37.1	33.6	19.2	29.5	6.4	6.1	39.3	35.8	46.0	6.7	10.2	
7.	528.06	BB	29.4	26.8	19.2	29.5	6.4	6.1	31.6	29.0	46.0	14.4	17.0	

CALCULATION:  $READING [dB \mu V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB]$ .

■ ANTENNA: KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz  
■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V(PC:AC120V/60Hz)  
Mode : Transmitting(2480MHz)  
Remarks : Tx Antenna Type: LDA92  
Date : 11/20/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 37 %  
Regulation : FCC Part15C §15.209

  
Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]	HOR [dB]	VER [dB]		
1.	66.75	BB	29.4	29.1	7.2	28.6	2.0	6.1	16.1	15.8	40.0	23.9	24.2	
2.	71.00	BB	38.3	36.5	6.6	28.5	2.1	6.1	24.6	22.8	40.0	15.4	17.2	
3.	250.00	BB	29.3	27.4	16.8	27.8	4.2	6.1	28.6	26.7	46.0	17.4	19.3	
4.	497.67	BB	35.6	33.7	19.0	29.1	6.2	6.1	37.8	35.9	46.0	8.2	10.1	
5.	500.32	BB	29.3	32.0	19.0	29.1	6.2	6.1	31.5	34.2	46.0	14.5	11.8	
6.	522.24	BB	35.9	32.4	19.2	29.5	6.4	6.1	38.1	34.6	46.0	7.9	11.4	
7.	528.10	BB	29.9	29.8	19.2	29.5	6.4	6.1	32.1	32.0	46.0	13.9	14.0	


CALCULATION:  $READING[dB \mu V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB]$ .

■ ANTENNA: KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz  
■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC: AC120V/60Hz)  
Mode : Transmitting (2402MHz)  
Remarks : Tx Antenna Type: LDA92  
Date : 11/22/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 36 %  
Regulation : FCC Part15C §15.209 (AV Detection)

  
\_\_\_\_\_  
Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS [dB μV/m]	MARGIN	
			HOR [dB μV]	VER					HOR [dB μV/m]	VER		HOR [dB]	VER
1.	2390.00	BB	35.1	36.5	30.6	36.7	2.4	0.0	31.4	32.8	54.0	22.6	21.2
2.	4804.00	BB	40.4	42.9	34.6	37.1	3.5	0.0	41.4	43.9	54.0	12.6	10.1
3.	7206.00	BB	32.4	32.1	37.6	37.0	4.2	0.0	37.2	36.9	54.0	16.8	17.1
4.	9608.00	BB	32.4	32.3	39.0	37.0	5.2	0.0	39.6	39.5	54.0	14.4	14.5
5.	12010.00	BB	32.6	32.5	42.0	36.1	5.6	0.0	44.1	44.0	54.0	9.9	10.0
6.	14412.00	BB	31.7	31.7	41.1	35.1	6.3	0.0	44.0	44.0	54.0	10.0	10.0
7.	16814.00	BB	32.2	32.2	41.6	34.9	6.5	0.0	45.4	45.4	54.0	8.6	8.6
8.	19216.00	BB	32.3	33.1	41.3	34.8	7.2	0.0	46.0	46.8	54.0	8.0	7.2
9.	21618.00	BB	32.7	33.1	41.3	34.9	7.5	0.0	46.6	47.0	54.0	7.4	7.0
10.	24020.00	BB	32.8	32.8	40.5	34.6	8.1	0.0	46.8	46.8	54.0	7.2	7.2

CALCULATION: READING [dB μV] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB].

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC:AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: LDA92  
Date : 11/22/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 36 %  
Regulation : FCC Part15C §15.209 (AV Detection)

  
Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]	HOR [dB]	VER [dB]		
1.	2483.50	BB	48.0	50.3	30.6	36.7	2.4	0.0	44.3	46.6	54.0	9.7	7.4	
2.	2484.06	BB	48.7	50.9	30.6	36.7	2.4	0.0	45.0	47.2	54.0	9.0	6.8	
3.	4960.00	BB	34.2	40.2	35.6	36.8	3.5	0.0	36.5	42.5	54.0	17.5	11.5	
4.	7440.00	BB	32.0	32.0	38.0	36.9	4.3	0.0	37.4	37.4	54.0	16.6	16.6	
5.	9920.00	BB	32.8	32.9	39.0	36.8	5.4	0.0	40.4	40.5	54.0	13.6	13.5	
6.	12400.00	BB	31.6	31.6	42.6	35.6	5.7	0.0	44.3	44.3	54.0	9.7	9.7	
7.	14880.00	BB	32.8	32.8	42.6	35.5	6.5	0.0	46.4	46.4	54.0	7.6	7.6	
8.	17360.00	BB	32.9	32.9	42.7	34.9	6.7	0.0	47.4	47.4	54.0	6.6	6.6	
9.	19840.00	BB	32.1	32.3	40.9	35.3	7.5	0.0	45.2	45.4	54.0	8.8	8.6	
10.	22320.00	BB	33.6	33.7	41.4	35.3	7.2	0.0	46.9	47.0	54.0	7.1	7.0	
11.	24800.00	BB	33.2	32.7	40.8	34.2	8.3	0.0	48.1	47.6	54.0	5.9	6.4	

CALCULATION: READING [dB μV] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB].

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz / KHA-03 (3160-09) 18-26.5GHz  
■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co.,Ltd  
 Kind of Equipment : Bluetooth Transceiver module  
 Model No. : UPGZ3  
 Serial No. : 11  
 Power : DC3. 3V (PC: AC120V/60Hz)  
 Mode : Transmitting (2402MHz)  
 Remarks : Tx Antenna Type: LDA92  
 Date : 11/22/2002  
 Test Distance : 3 m  
 Temperature : 23 °C  
 Humidity : 36 %  
 Regulation : FCC Part15C § 15. 209 (PK Detection)

  
 Engineer : Toyokazu Imamura

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	46.2	47.7	30.6	36.7	2.4	0.0	42.5	44.0	74.0	31.5	30.0
2.	4804.00	BB	49.2	50.2	34.6	37.1	3.5	0.0	50.2	51.2	74.0	23.8	22.8
3.	7206.00	BB	45.4	45.1	37.6	37.0	4.2	0.0	50.2	49.9	74.0	23.8	24.1
4.	9608.00	BB	46.1	44.7	39.0	37.0	5.2	0.0	53.3	51.9	74.0	20.7	22.1
5.	12010.00	BB	45.4	45.2	42.0	36.1	5.6	0.0	56.9	56.7	74.0	17.1	17.3
6.	14412.00	BB	44.7	44.7	41.1	35.1	6.3	0.0	57.0	57.0	74.0	17.0	17.0
7.	16814.00	BB	45.3	44.7	41.6	34.9	6.5	0.0	58.5	57.9	74.0	15.5	16.1
8.	19216.00	BB	45.2	45.2	41.3	34.8	7.2	0.0	58.9	58.9	74.0	15.1	15.1
9.	21618.00	BB	46.4	46.1	41.3	34.9	7.5	0.0	60.3	60.0	74.0	13.7	14.0
10.	24020.00	BB	45.7	45.5	40.5	34.6	8.1	0.0	59.7	59.5	74.0	14.3	14.5


CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26.5GHz  
 ■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

# DATA OF RADIATION TEST

A-PEX INTERNATIONAL CO., LTD.  
Yamakita No.1 Open Test Site  
Report No. : 23DE0002-YK-1

Applicant : ALPS Electric Co., Ltd  
Kind of Equipment : Bluetooth Transceiver module  
Model No. : UPGZ3  
Serial No. : 11  
Power : DC3.3V (PC: AC120V/60Hz)  
Mode : Transmitting (2480MHz)  
Remarks : Tx Antenna Type: LDA92  
Date : 11/22/2002  
Test Distance : 3 m  
Temperature : 23 °C  
Humidity : 36 %  
Regulation : FCC Part15C §15.209 (PK Detection)

  
Engineer : Toyokazu Imamura

No.	FREQ. [MHz]	ANT TYPE	READING		ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
			HOR [dB μV]	VER					HOR [dB μV/m]	VER	HOR [dB]	VER		
1.	2483.50	BB	59.6	60.0	30.6	36.7	2.4	0.0	55.9	56.3	74.0	18.1	17.7	
2.	2484.06	BB	58.8	61.4	30.6	36.7	2.4	0.0	55.1	57.7	74.0	18.9	16.3	
3.	4960.00	BB	49.0	48.2	35.6	36.8	3.5	0.0	51.3	50.5	74.0	22.7	23.5	
4.	7440.00	BB	45.0	45.1	38.0	36.9	4.3	0.0	50.4	50.5	74.0	23.6	23.5	
5.	9920.00	BB	45.2	45.2	39.0	36.8	5.4	0.0	52.8	52.8	74.0	21.2	21.2	
6.	12400.00	BB	44.2	44.7	42.6	35.6	5.7	0.0	56.9	57.4	74.0	17.1	16.6	
7.	14880.00	BB	45.6	45.6	42.6	35.5	6.5	0.0	59.2	59.2	74.0	14.8	14.8	
8.	17360.00	BB	45.5	45.9	42.7	34.9	6.7	0.0	60.0	60.4	74.0	14.0	13.6	
9.	19840.00	BB	44.6	45.3	40.9	35.3	7.5	0.0	57.7	58.4	74.0	16.3	15.6	
10.	22320.00	BB	46.2	46.3	41.4	35.3	7.2	0.0	59.5	59.6	74.0	14.5	14.4	
11.	24800.00	BB	46.4	46.4	40.8	34.2	8.3	0.0	61.3	61.3	74.0	12.7	12.7	

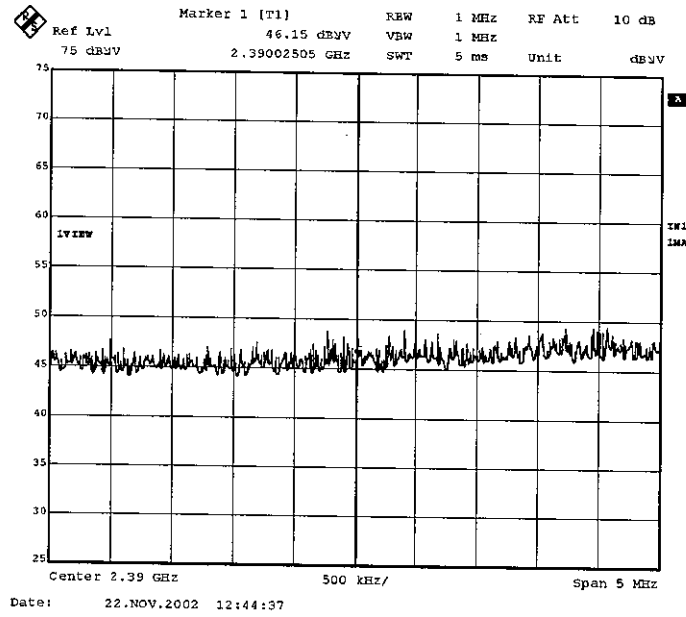
CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

- ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26.5GHz
- CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

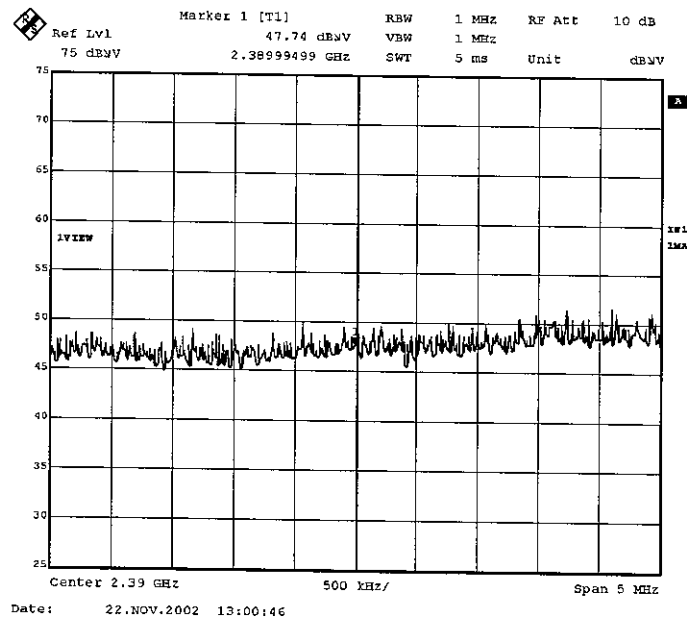
Antenna Type:LDA92

2.39GHz (Ch :2402MHz)

1. Horizontal/PK

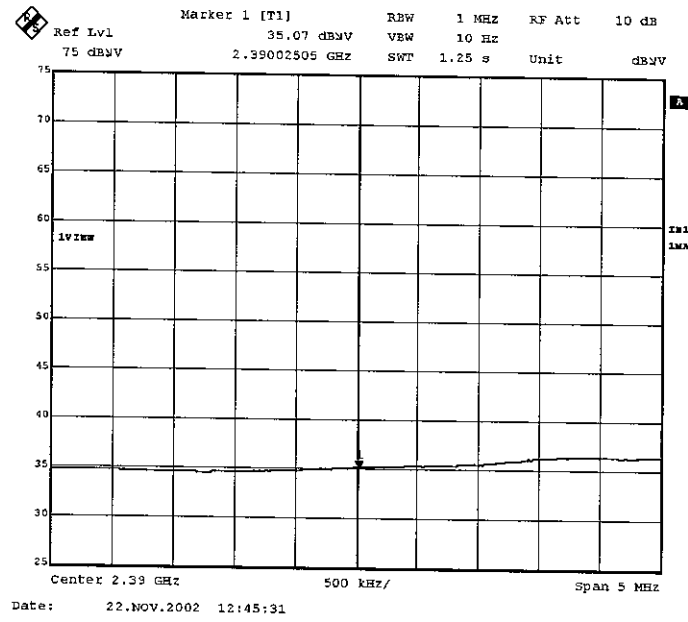


2. Vertical/PK

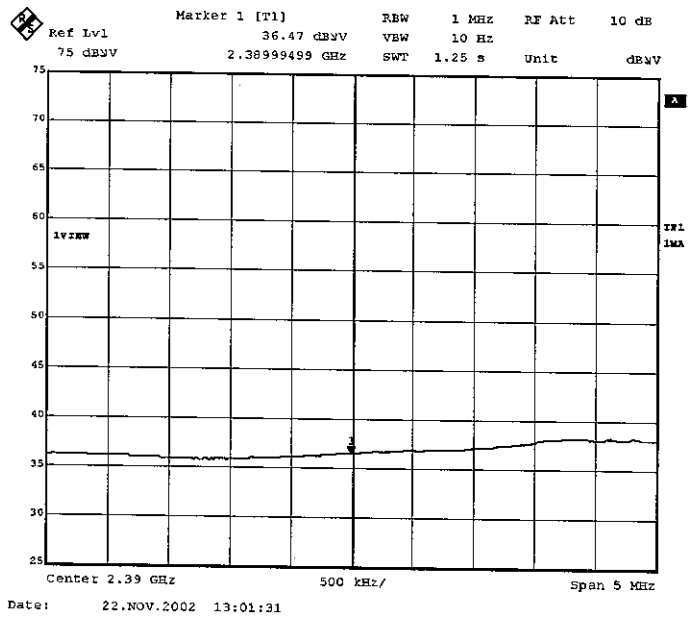




3. Horizontal/AV

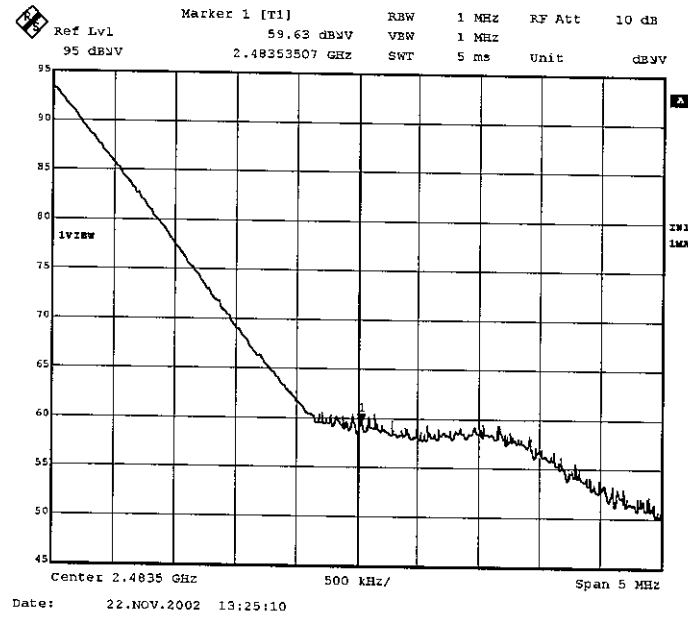


4. Vertical/AV

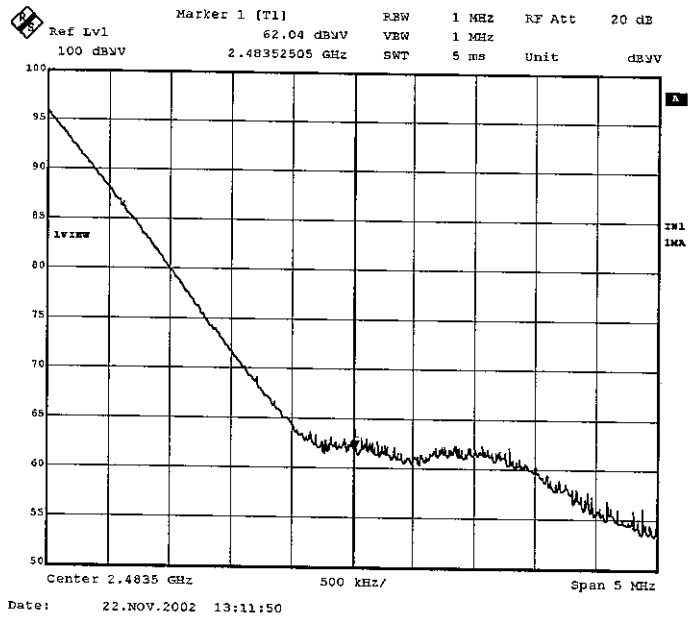


2.4835GHz (Ch :2480MHz)

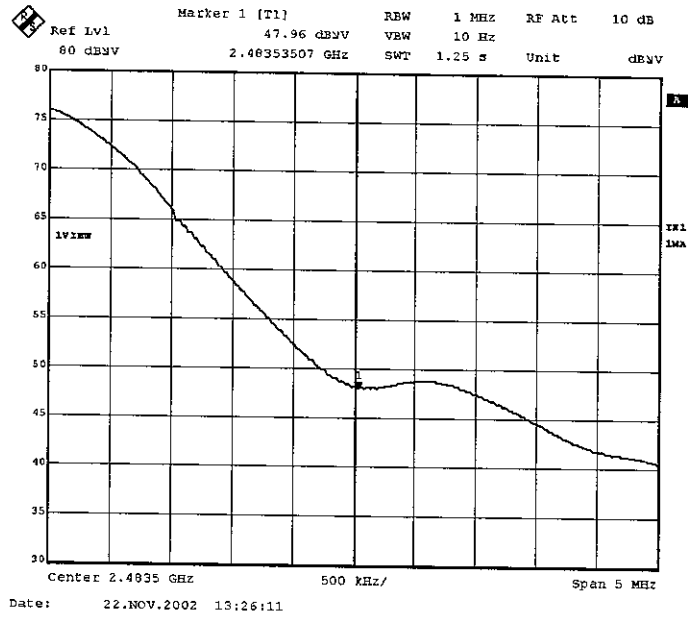
1. Horizontal/PK



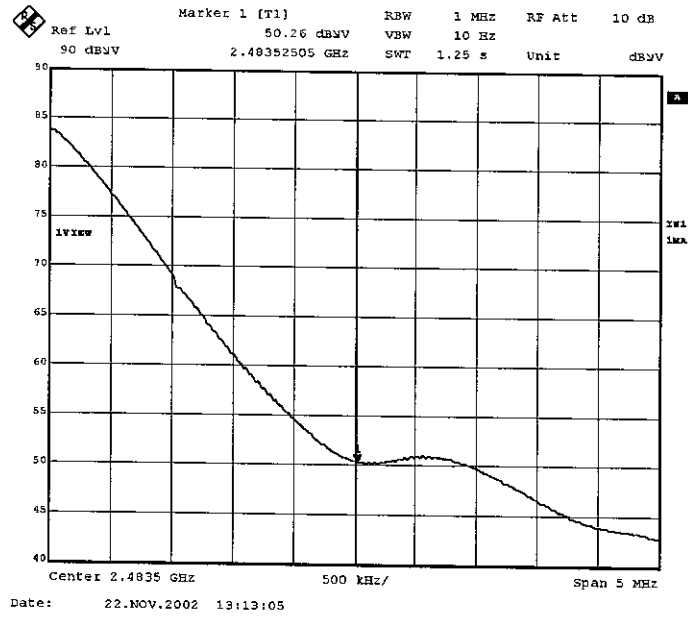
2. Vertical/PK



3. Horizontal/AV

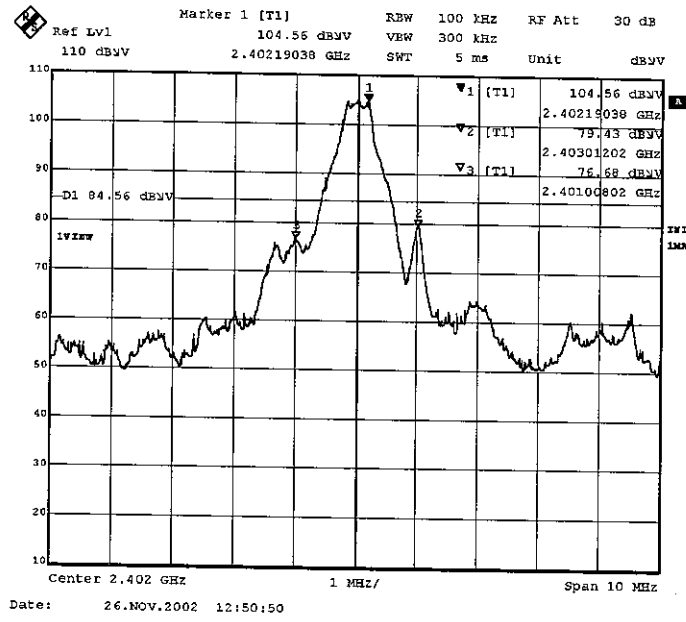


4. Vertical/AV

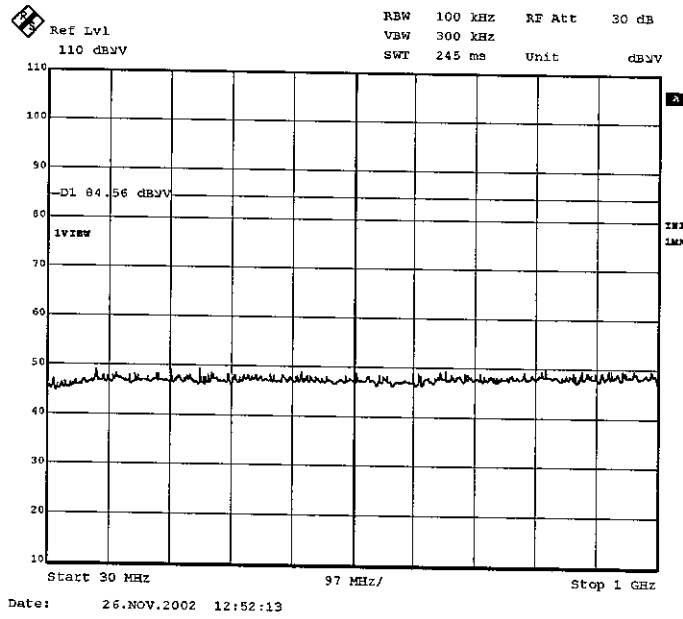


Ch Low: 2402MHz

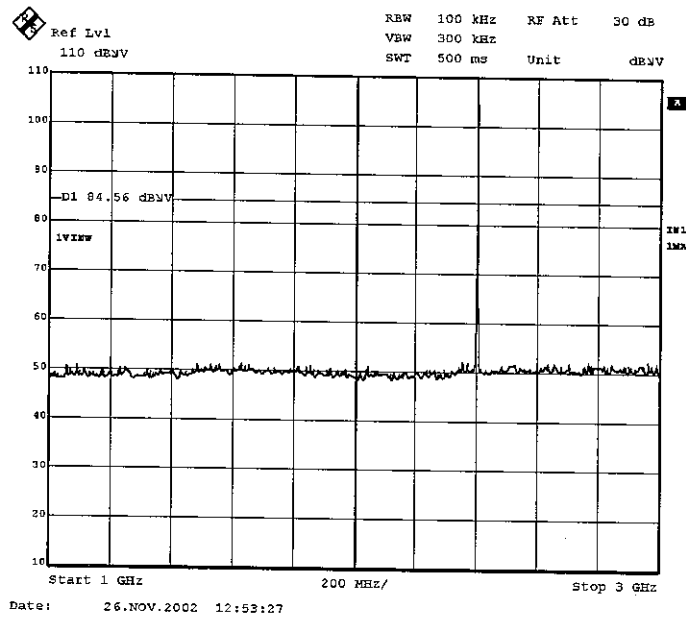
1.



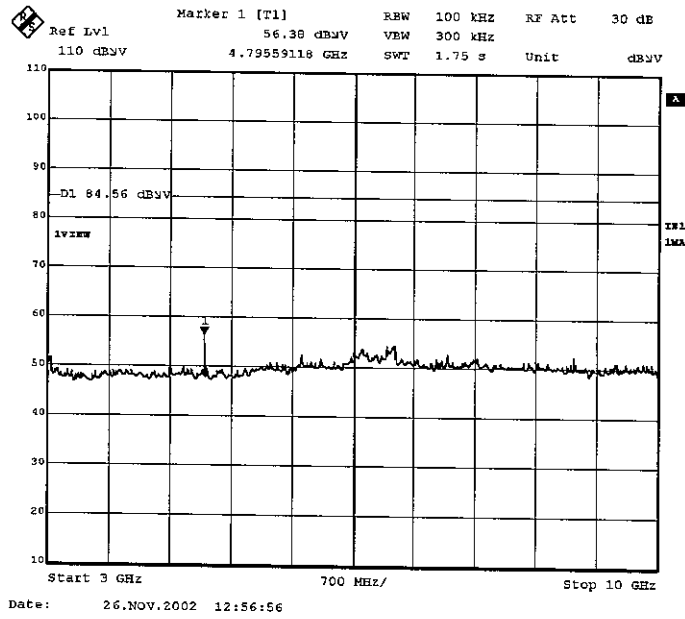
2.



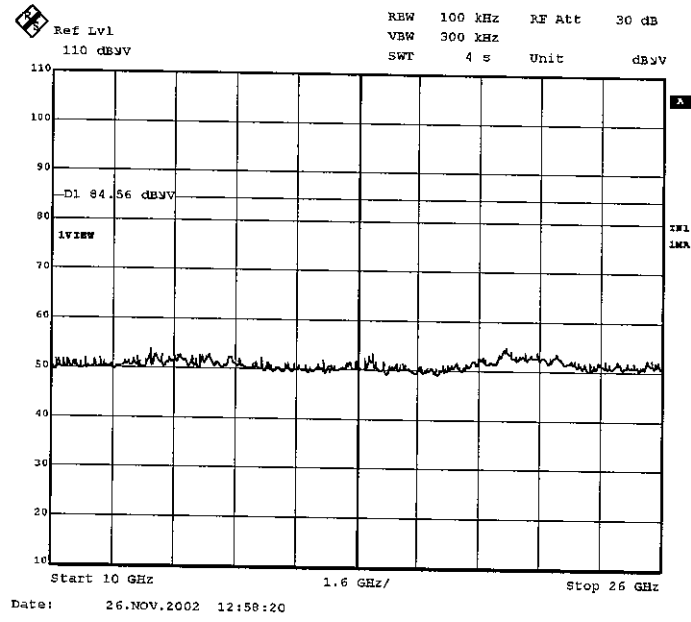
3.



4.

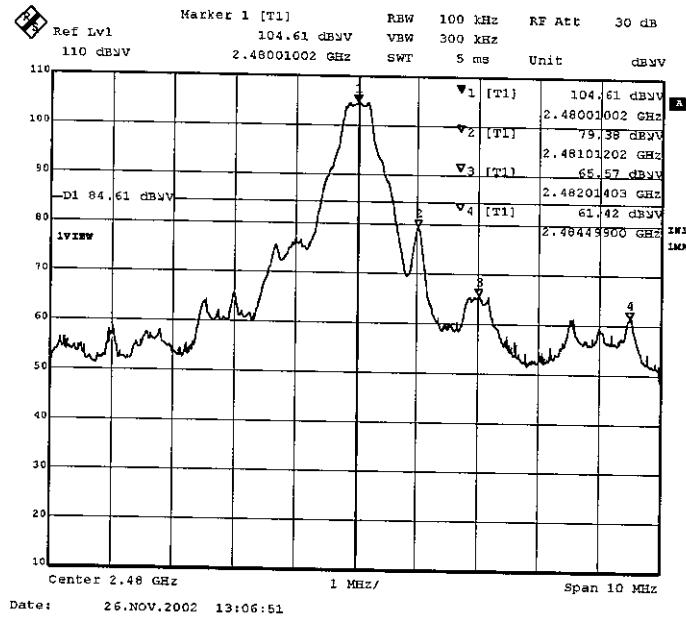


5.

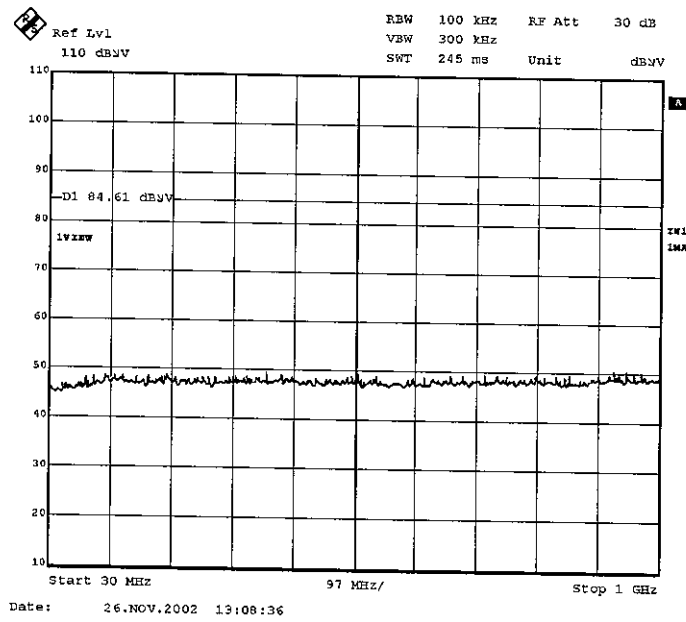


Ch High: 2480MHz

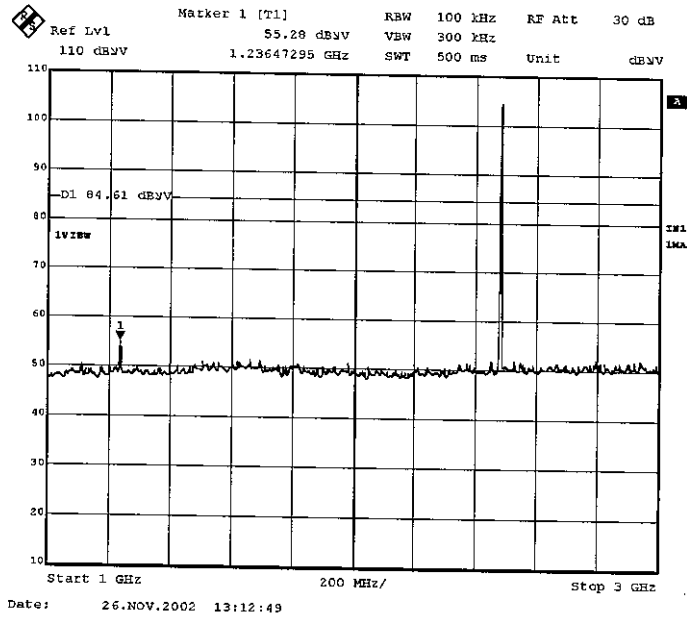
1.



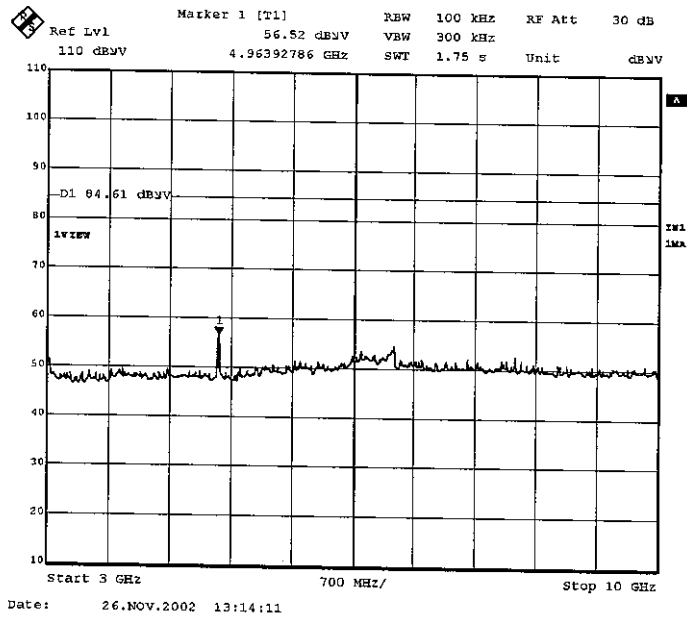
2.



3.

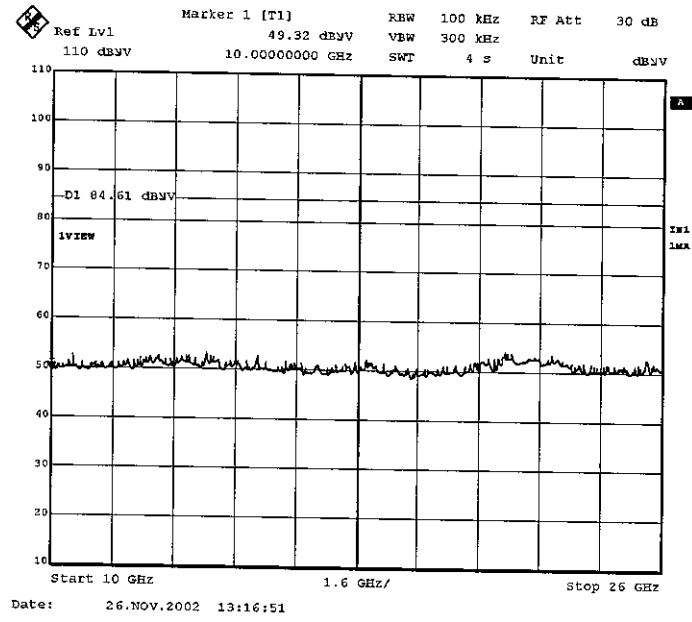


4.





5.



Test Report No : 23DE0002-YK-1

**APPENDIX 3  
Test Instruments**

**EMI test equipment**

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
KAF-01	Pre Amplifier	Hewlett Packard	8447D	RE	2002/08/03 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	RE	2002/05/07 * 12
KAT6-01	Attenuator	INMET	18N-6dB	RE	2002/06/20 * 12
KBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2002/08/17 * 12
KCC-10/11/12/13/18	Coaxial Cable	Fujikura/Suhner	8D-2W/12D-SF A/S04272B/S0 4272B/S04272B	RE	2002/08/17 * 12
KCC-14/15/16/18/KPL-01	Coaxial Cable/Pulse Limitter	Fujikura/Suhner/PMM	5D-2W/8D-2W/ S04272B/S0427 2B/PL01	CE	2002/08/17 * 12
KCC-D3	Coaxial Cable	Rosenberger	2201	RE	2002/06/28 * 12
KCC-D5	Coaxial Cable	Storm	421-011(2m)	AT	2002/04/16 * 12
KDT-01	Coaxial Crystal Detector	Agilent	8573C	AT	2002/04/22 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RE	2002/07/14 * 12
KHA-03	Horn Antenna	EMCO	3160-09	RE	2002/04/27 * 12
KLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2002/03/08 * 12
KLS-01	LISN	Schwarzbeck	NSLK8126	CE	2002/08/16 * 12
KOTS-01	Open Test Site	JSE	30m	RE	2002/08/18 * 12
KPM-05	Power meter	Agilent	E4417A	AT	2002/02/15 * 12
KPSS-01	Power sensor	Agilent	E9327A	AT	2002/03/12 * 12
KSA-01	Spectrum Analyzer	Advantest	R3365	CE/RE	2002/06/20 * 12
KTR-01	Test Receiver	Rohde & Schwarz	ES140	CE/RE/AT	2002/07/22 * 12
KST-01	Digitizing Oscilloscope	Tektronix	TDS420A	AT	2002/08/21 * 12

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

Test Item:

- CE: Conducted emission test,
- RE: Radiated emission test,
- AT: Antenna terminal conducted test