

EMI TEST REPORT

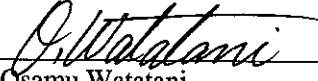
Test Report No. : 23DE0002-YK-1

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.

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MF060b(23.04.02)

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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

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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.

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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

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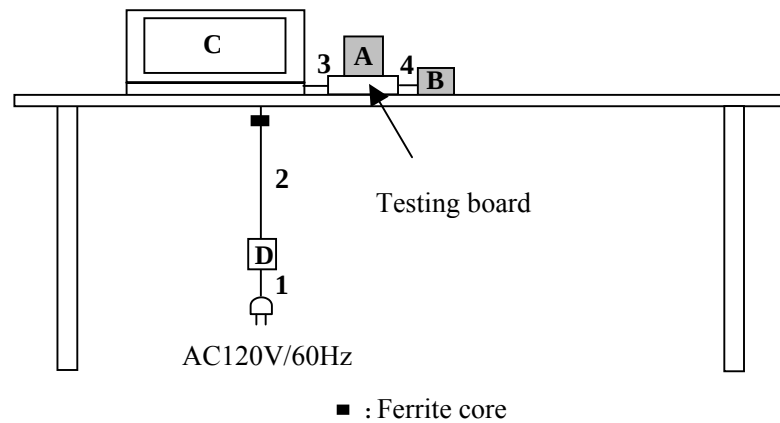
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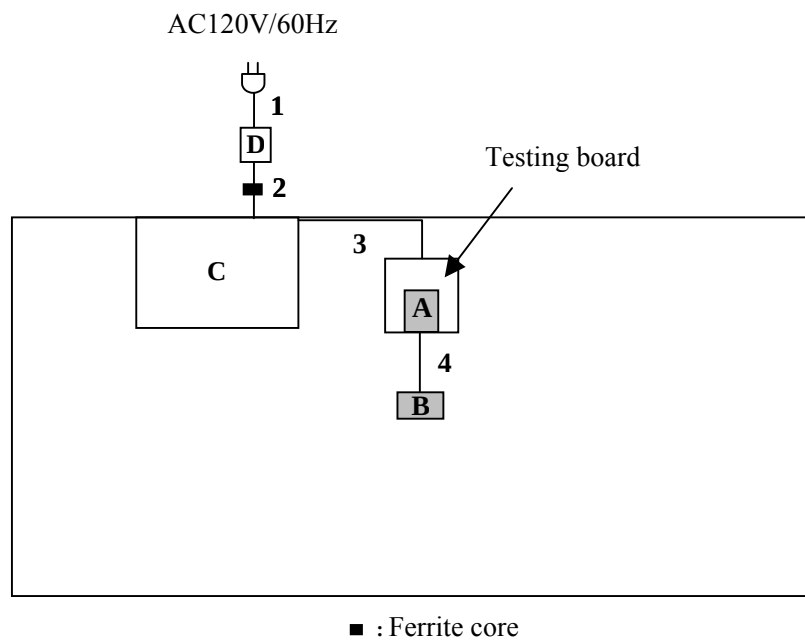
3.2 Configuration of Tested System

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.

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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

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4 MEASUREMENT UNCERTAINTY

Conducted emission test

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

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 $\pm 4.8\text{dB}$.

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

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

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

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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

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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 1channel.

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 1channel.

Maximum transmit ON time per appeared hopping is 120 μ 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 1channel.

Maximum transmit ON time per appeared hopping is 121 μ 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

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5.5 § 15.247(c) Out of Band Emissions (Radiated)

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. The Radiated Electric Field Strength intensity has been measured on an open test site 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. EUT emission levels were compared when the EUT antenna position was vertical polarization and horizontal polarization. The equipment was also previously checked at each position of three axes X, Y and Z. In 30-1000MHz, Y axis of all antenna types was worst under both vertical and horizontal polarization. In above 1GHz, Y axis of all antenna types was worst under the vertical antenna polarization. Under the horizontal antenna polarization, Z axis was worst (YCE-5255) and X axis was worst (SSW2400 and LDA92). The positions in which the maximum noise occurred were chosen to put into measurement. See the photographs in page 15 to 17.

Radiated spurious emissions

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement. The result was also satisfied the general limits specified in Sec.15.209 (a).
Measurement range : 30MHz to 1000MHz CISPR QP Detector, IF BW 120kHz
: 1GHz to 26GHz PK and AV Detector

Test data:

Antenna Type:	YCE-5255	SSW2400	LDA92	
APPENDIX Page	38 to 39	48 to 49	58 to 59	(30-1000MHz)
APPENDIX Page	40 to 43	50 to 53	60 to 63	(1 – 26GHz)
APPENDIX Page	44 to 47	54 to 57	64 to 67	(Band Edges:2390MHz/2483.5MHz, Restricted band Charts)

Photographs of test setup : Page 14

Test result : Pass

Test instruments : KAF-01, KAF-02, KAT6-1, KBA-01, KCC-10/11/12/13/18, KCC-D3, KHA-01, KHA-03, KLA-01, KOTS-01, KSA-01, KTR-01

5.6 § 15.247(c) 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.

Test data : APPENDIX Page 68 to 73

Test result : Pass

Test instruments : KTR-01, KCC-D5

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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
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Conducted emission



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Radiated emission



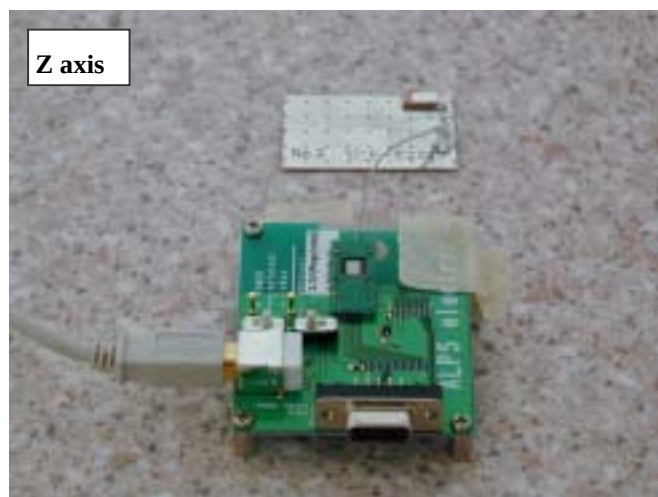
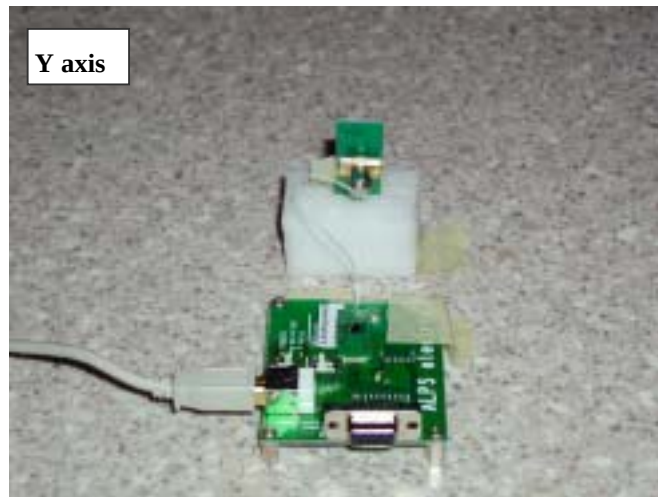
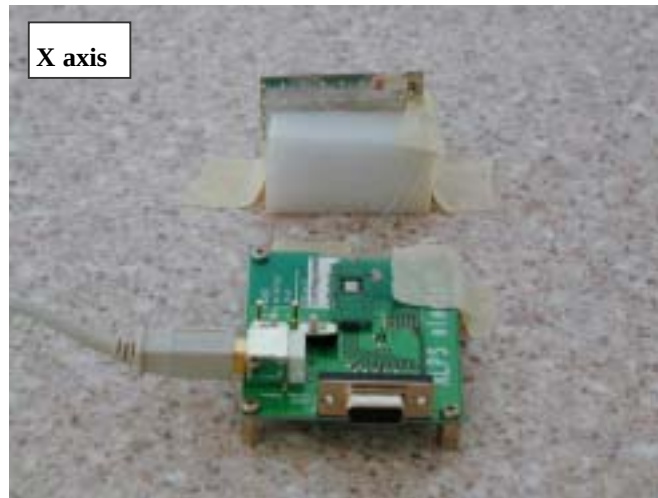
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Pre check of worse-case position (YCE-5255)



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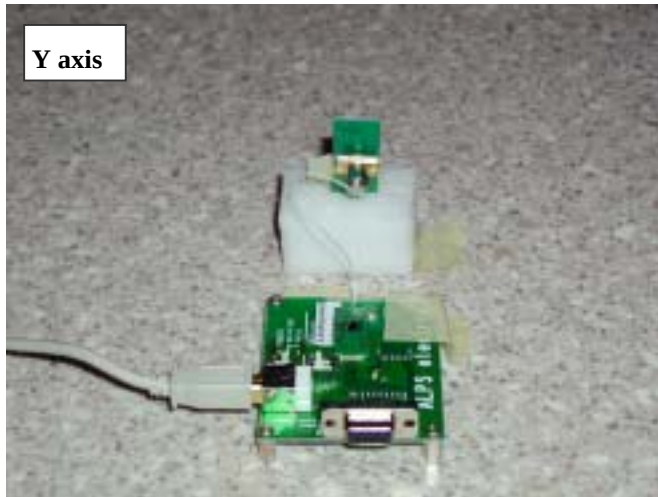
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Pre check of worse-case position (SSW2400)

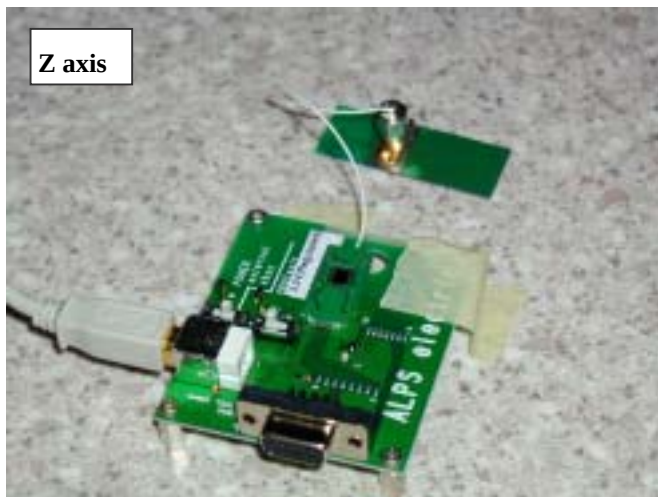
X axis



Y axis



Z axis



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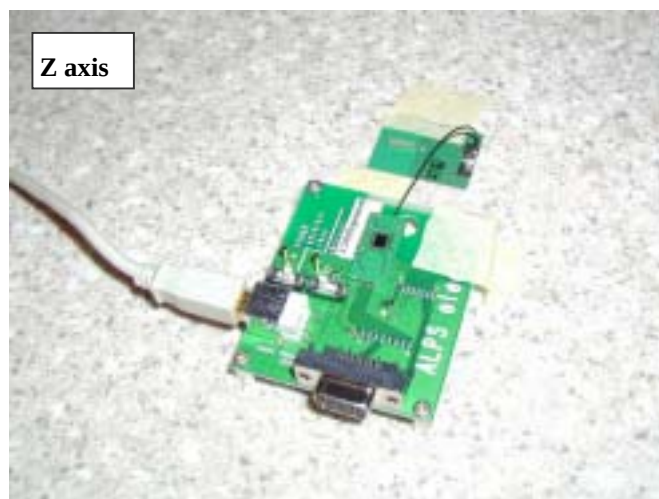
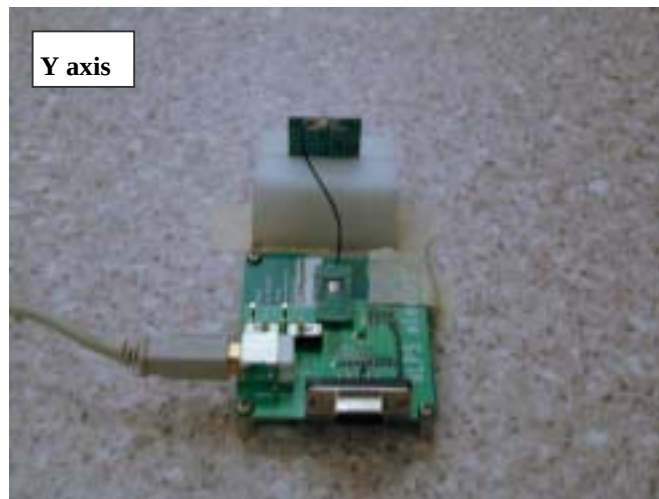
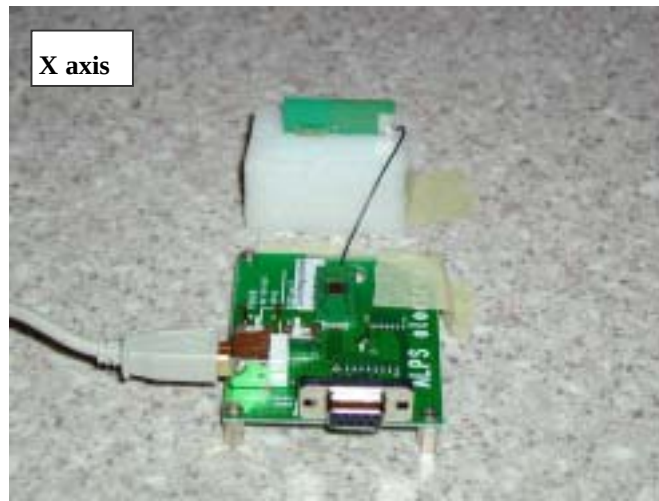
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Pre check of worse-case position (LDA92)



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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: YCE-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 [dBuV]	QP [dBuV]	AV [dBuV]				QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]
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[dBμV] + 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

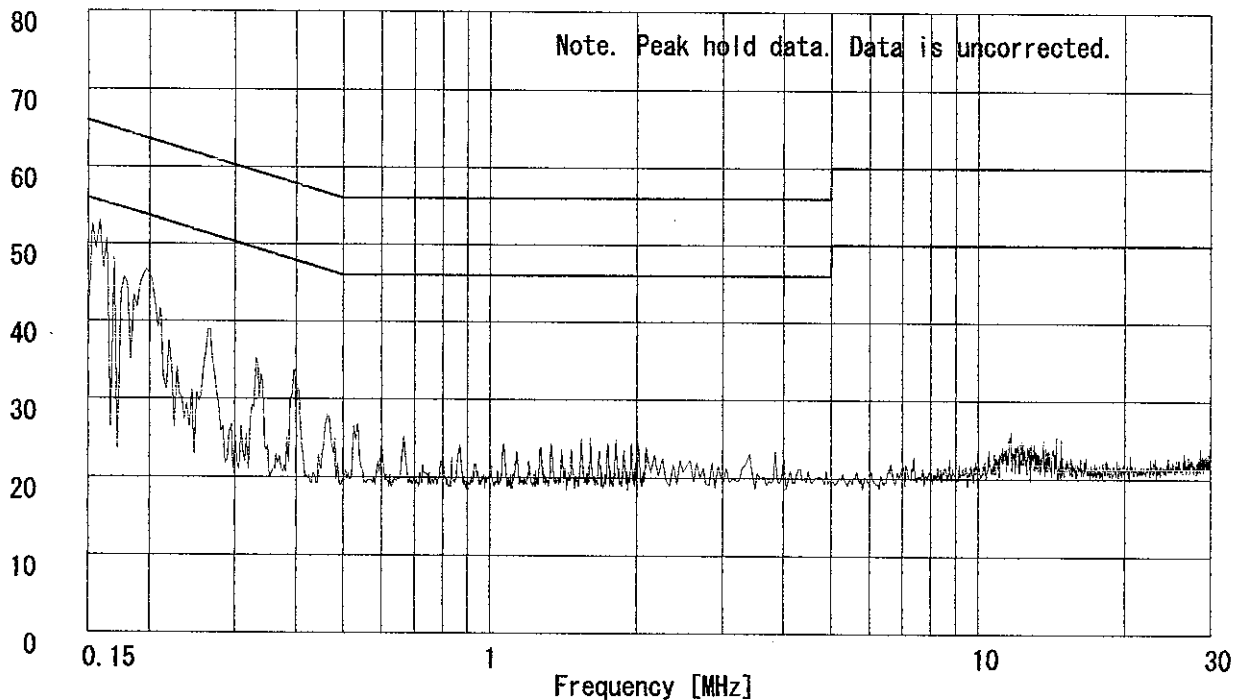
Report No. : 23DE0002-YK-1

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)

T. Imamura
Engineer : Toyokazu Imamura

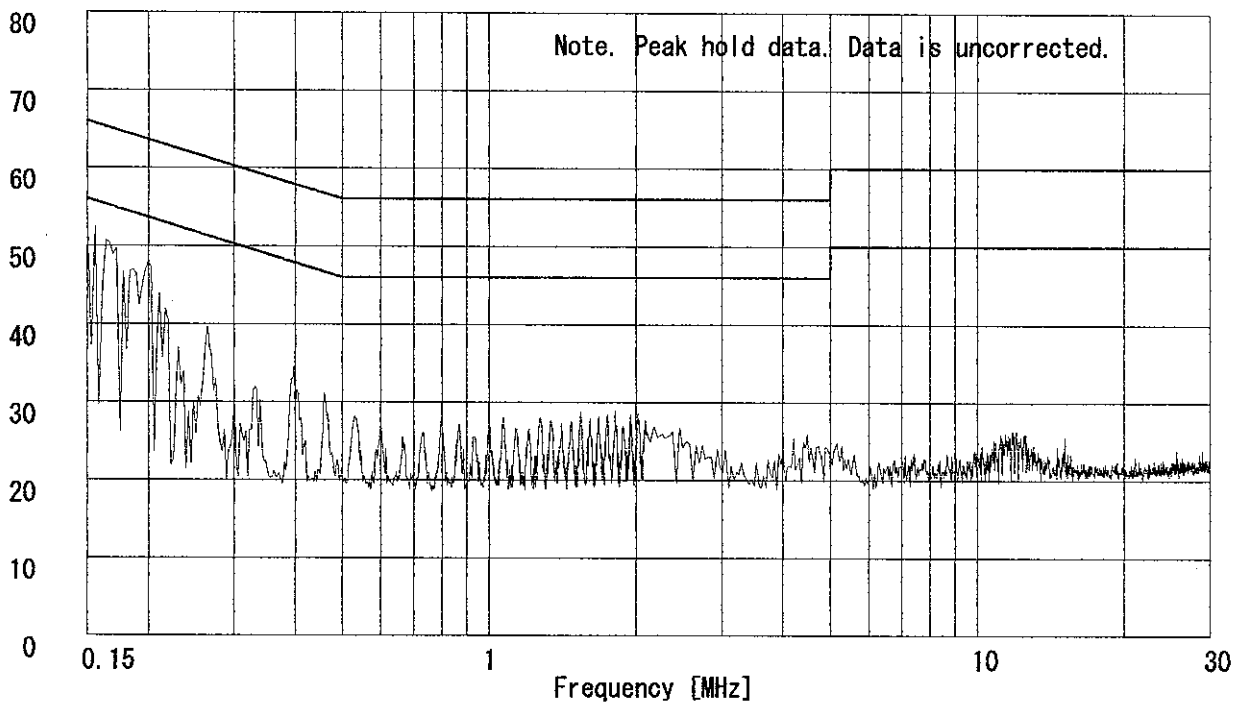
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.1 Shielded Room

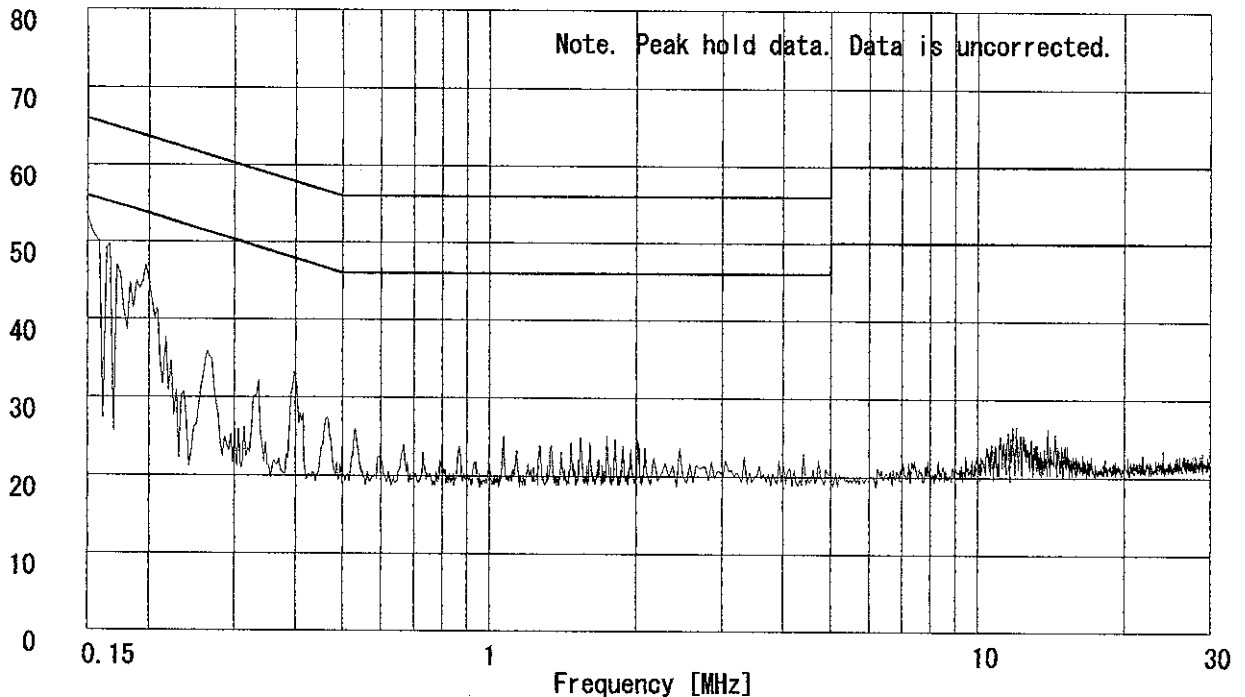
Report No. : 23DE0002-YK-1

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*
Toyokazu Imamura

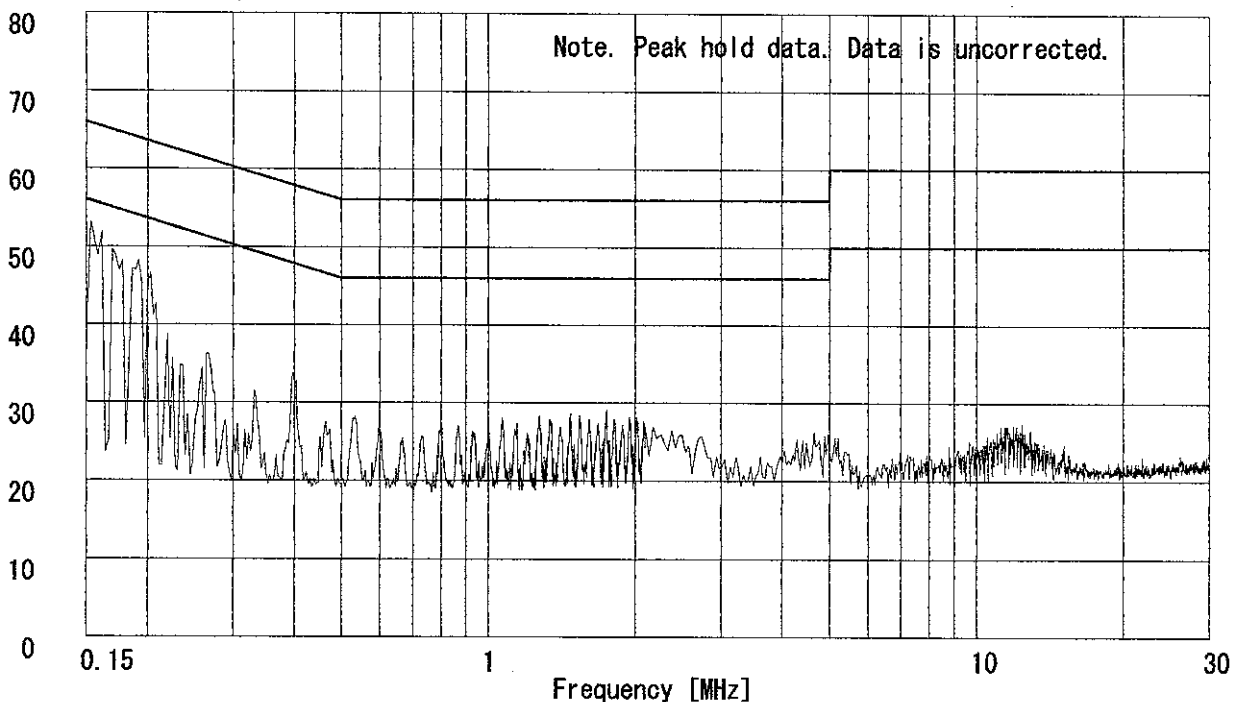
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

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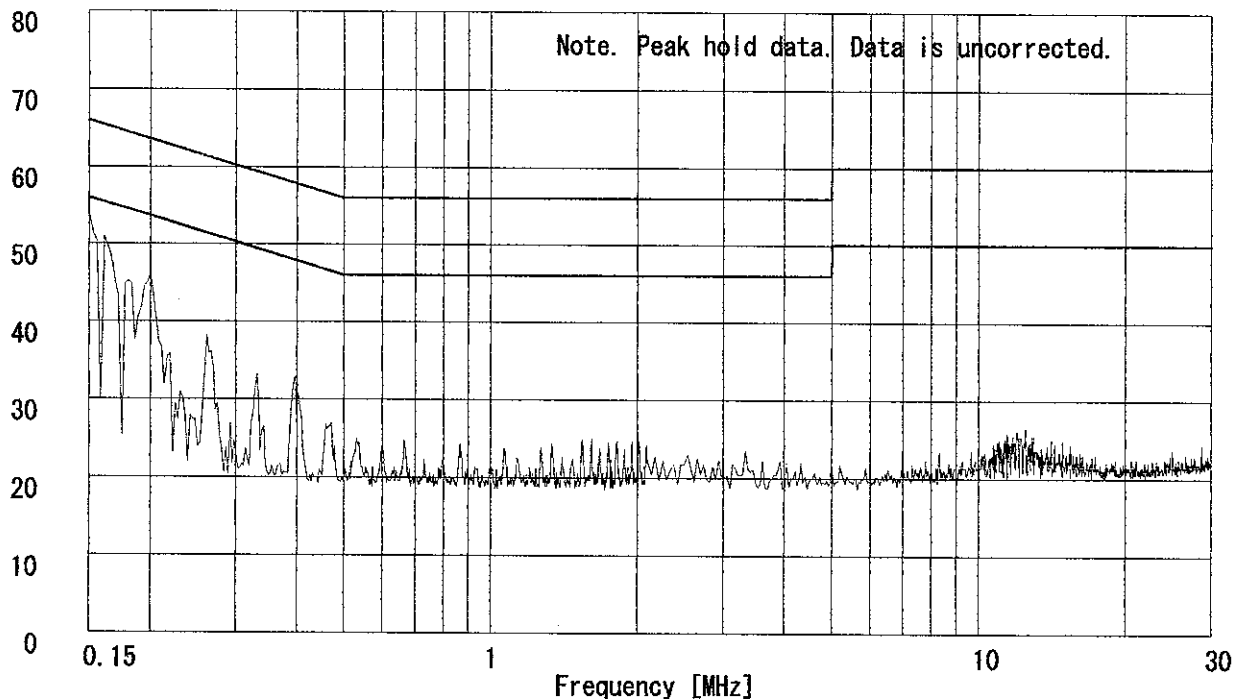
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Model No. : UPGZ3
Serial No. : 11
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Mode : Transmitting(2402MHz)
Remarks : Tx Antenna Type: SSW2400
Date : 11/22/2002
Phase : Single Phase
Temperature : 25 °C
Humidity : 41 %
Regulation 1 : FCC Part15C § 15.207. (CISPR Pub. 22)
Regulation 2 : FCC Part15C § 15.207. (CISPR Pub. 22)

Engineer : 
Toyokazu Imamura

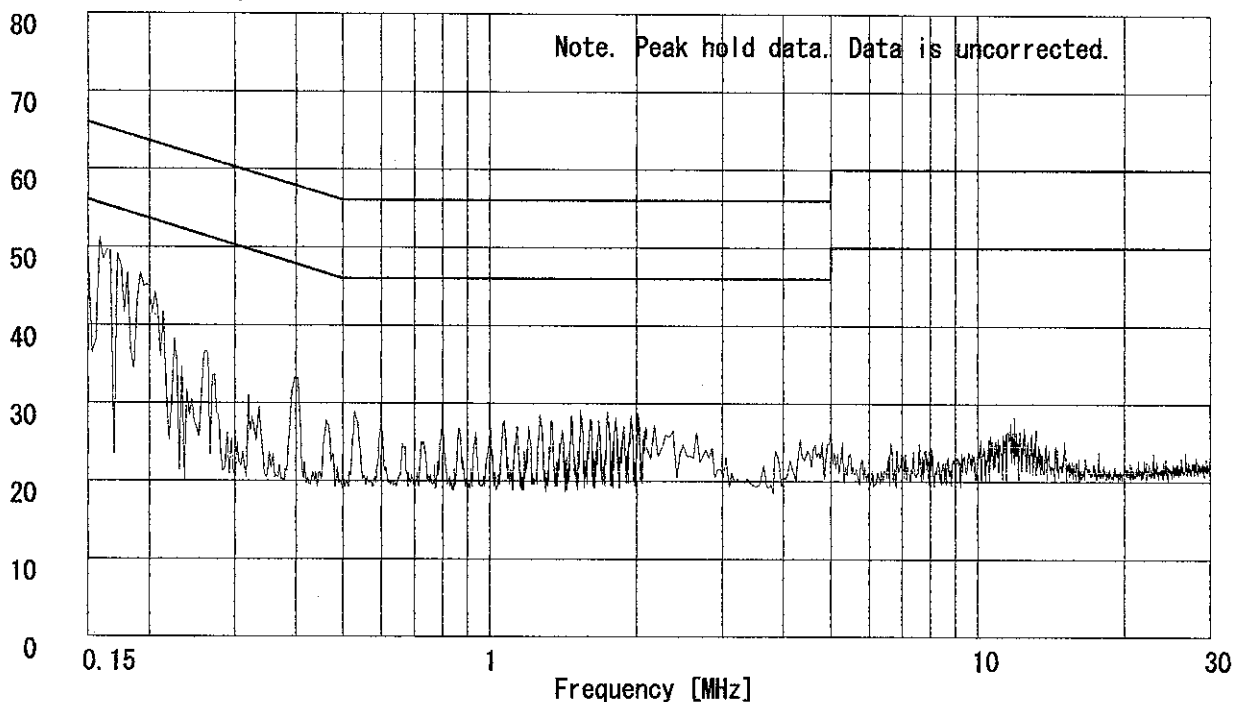
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.1 Shielded Room

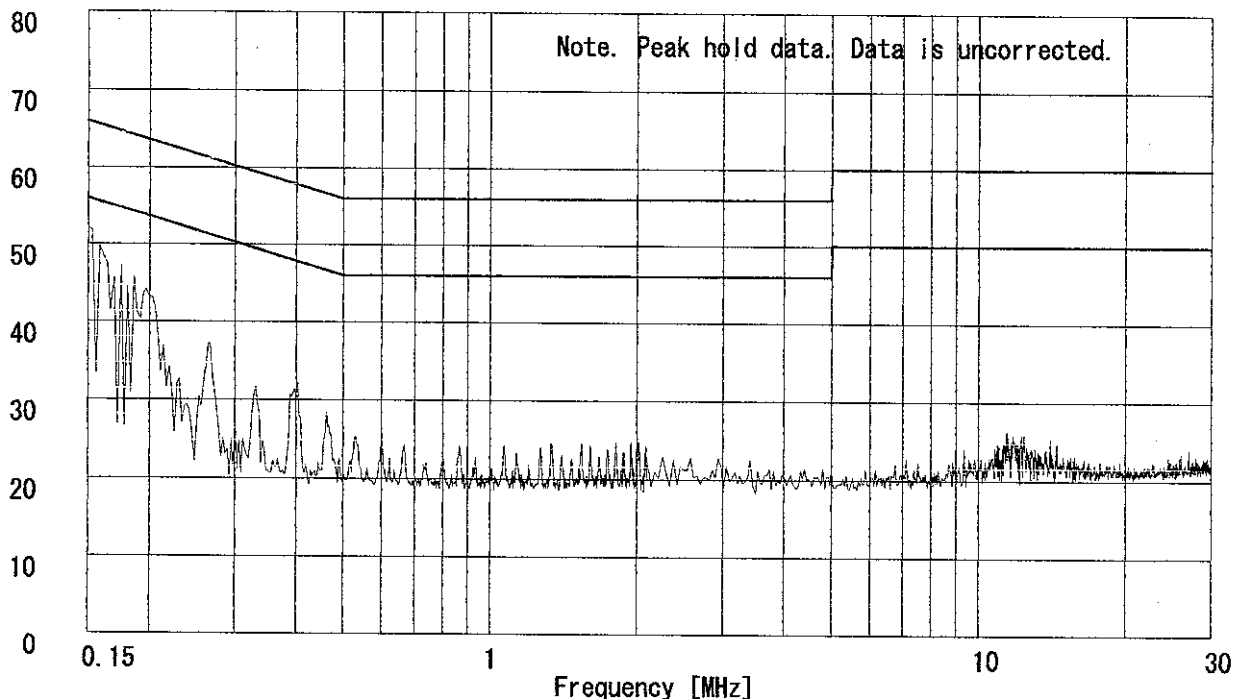
Report No. : 23DE0002-YK-1

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: 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)

T. Imamura
Engineer : Toyokazu Imamura

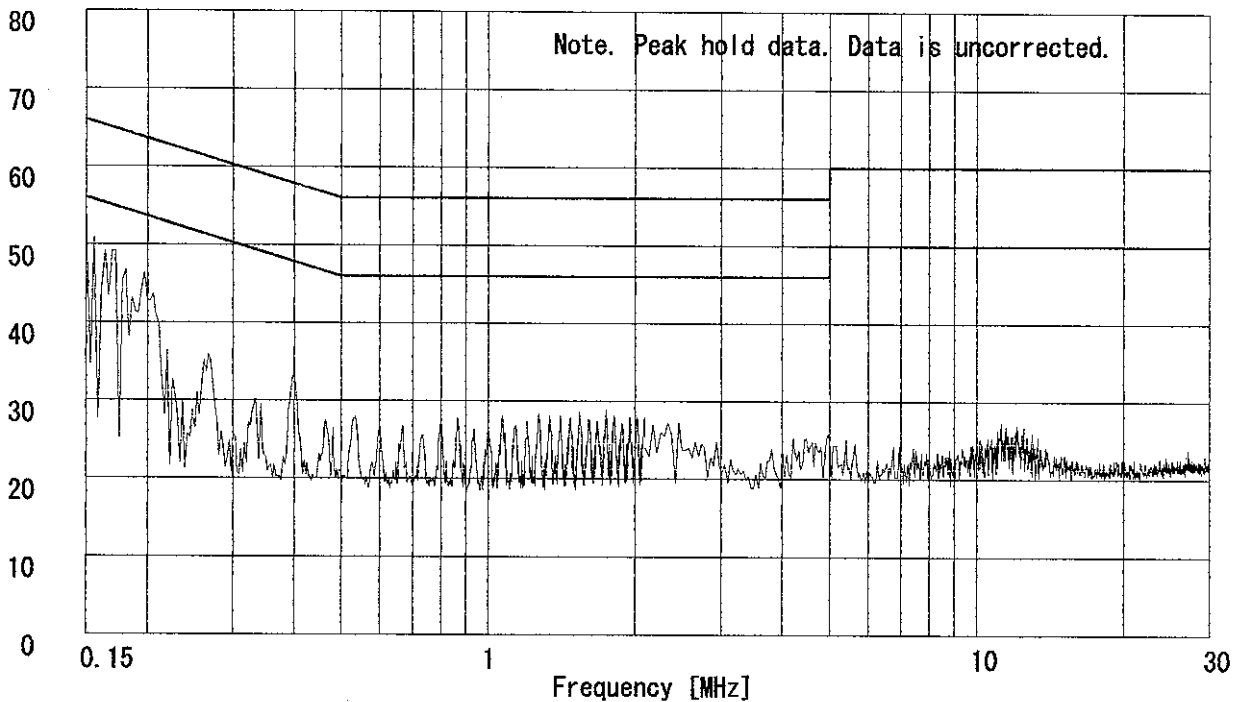
Emission Level [dB μ V]

PHASE:N



Emission Level [dB μ V]

PHASE:L1



DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.1 Shielded Room

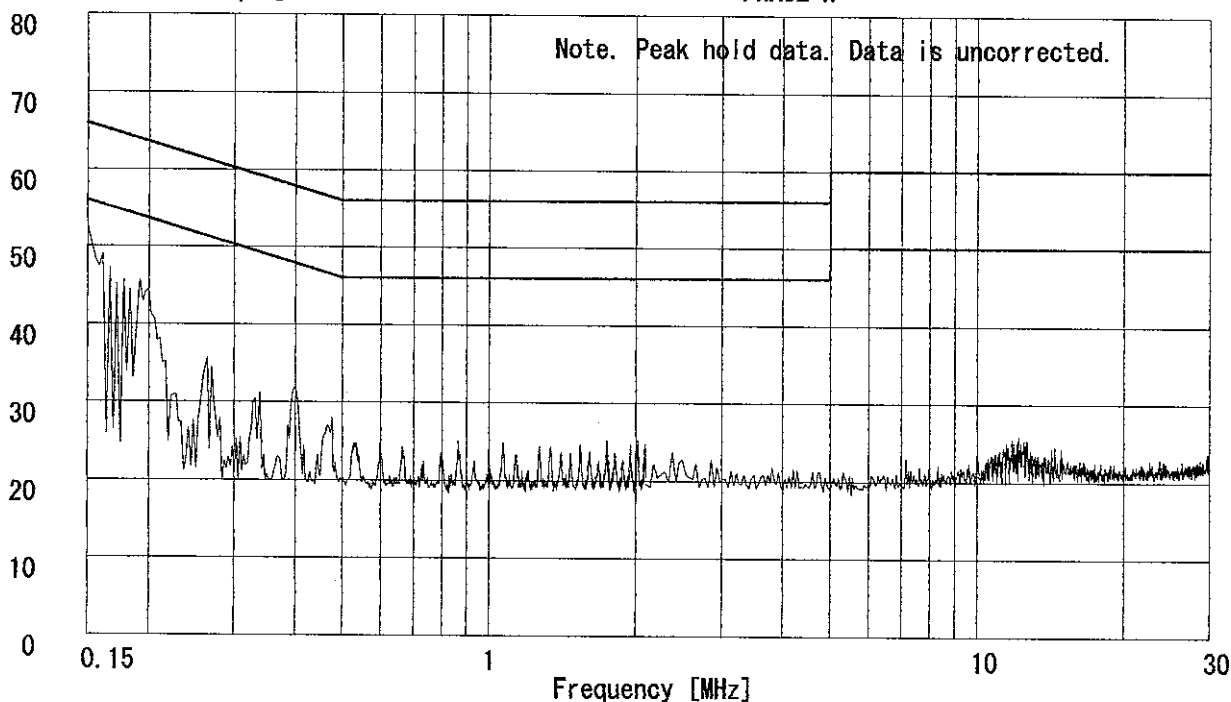
Report No. : 23DE0002-YK-1

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: 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

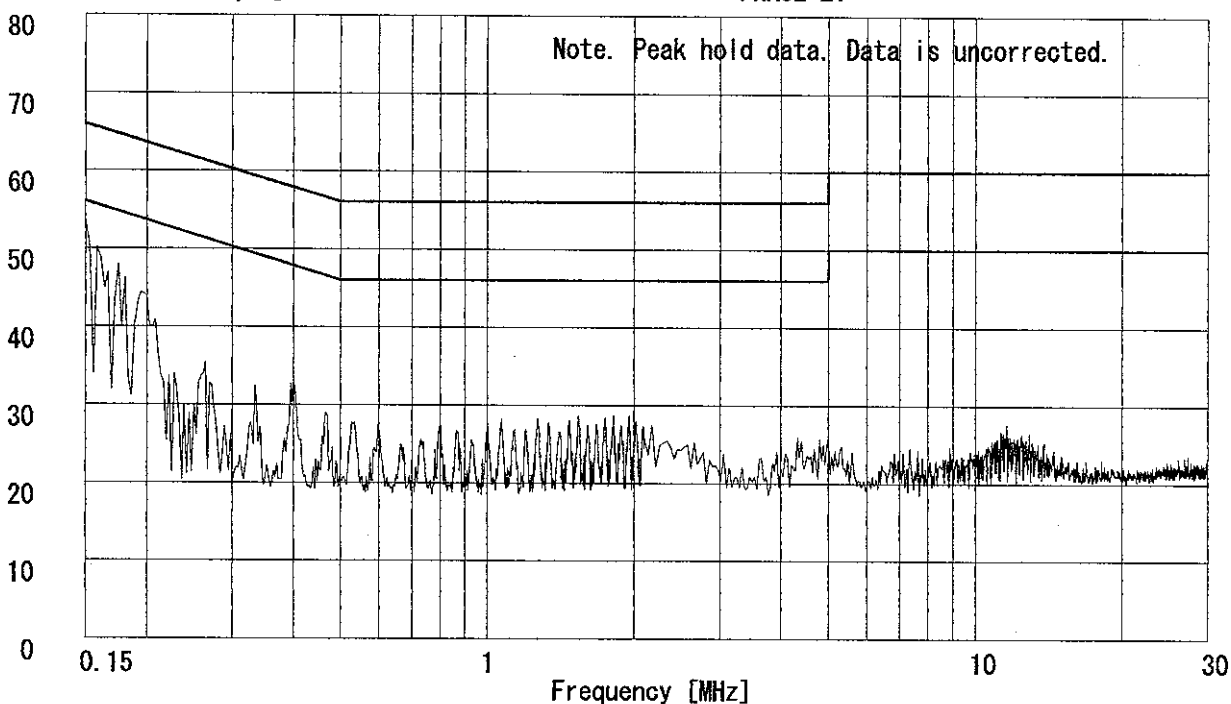
Emission Level [dBμV]

PHASE:N



Emission Level [dBμV]

PHASE:L1



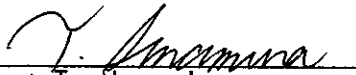
DATA OF CONDUCTION TEST CHART

A-PEX INTERNATIONAL CO., LTD.

Yamakita No.1 Shielded Room

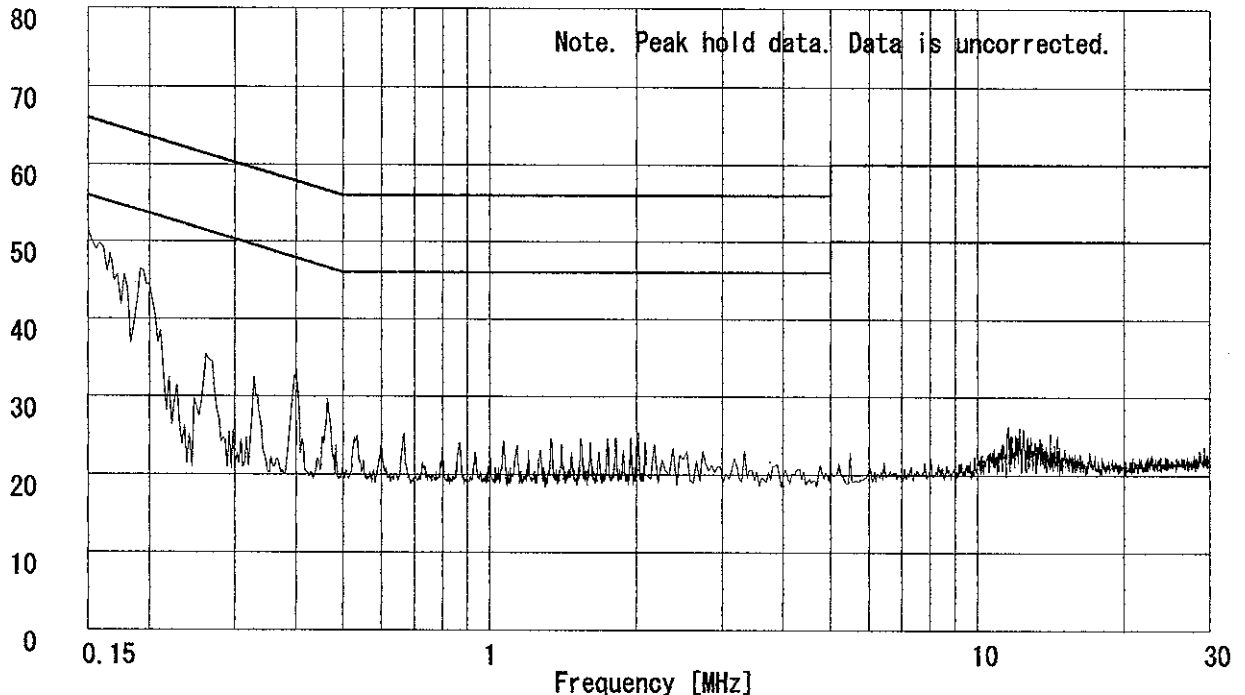
Report No. : 23DE0002-YK-1

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

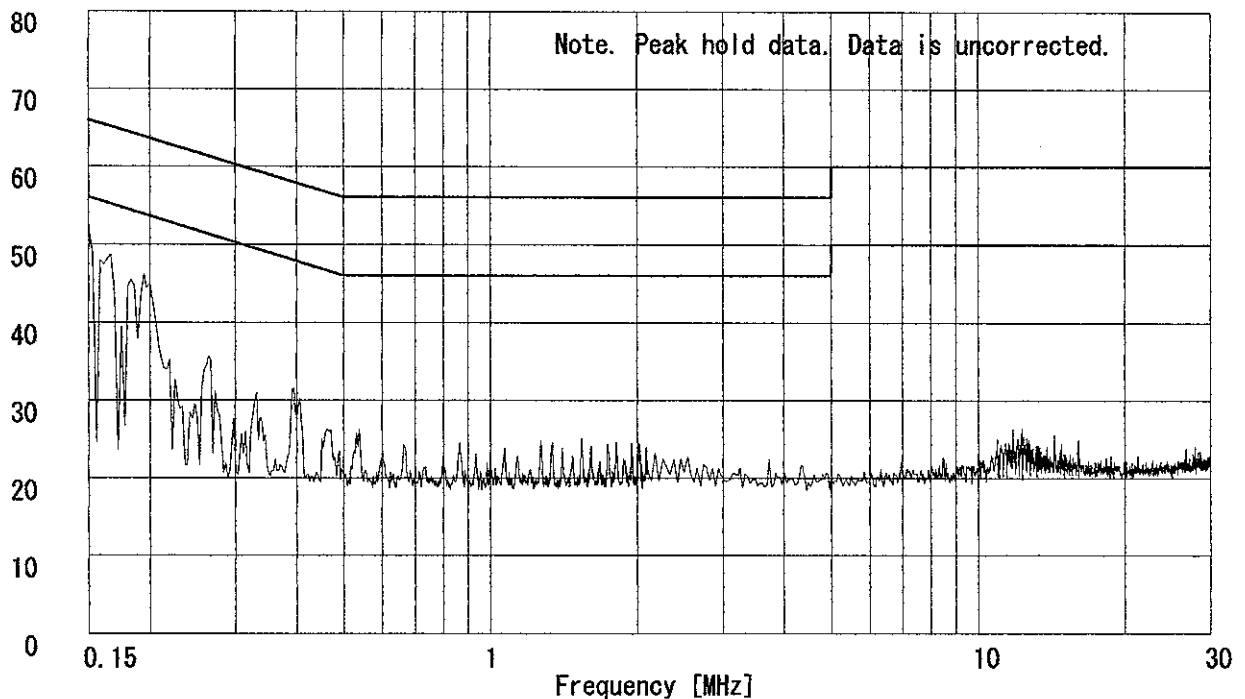
Emission Level [dB μ V]

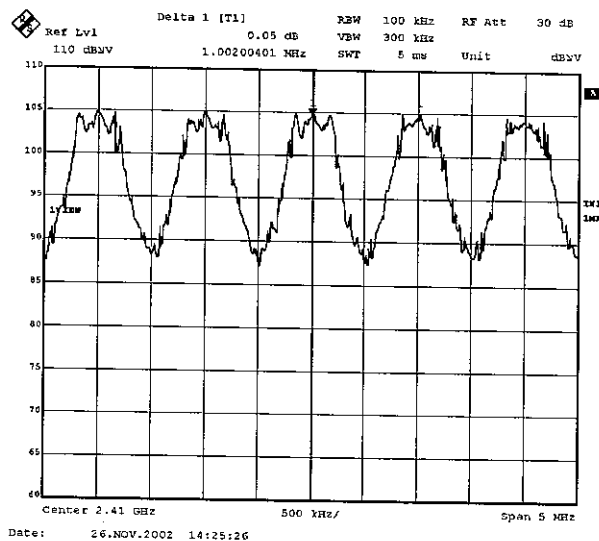
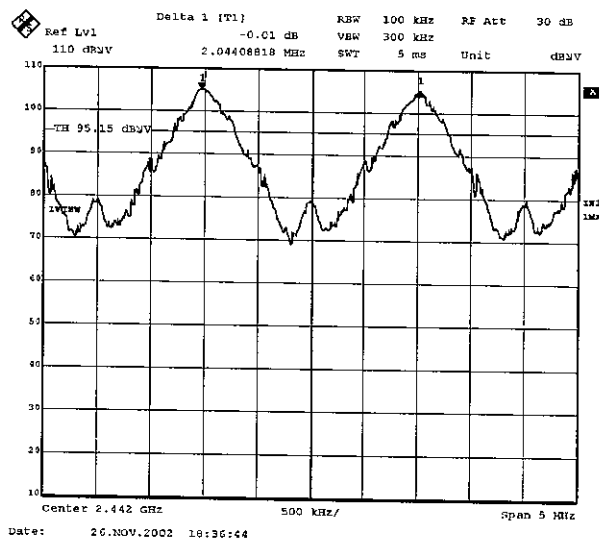
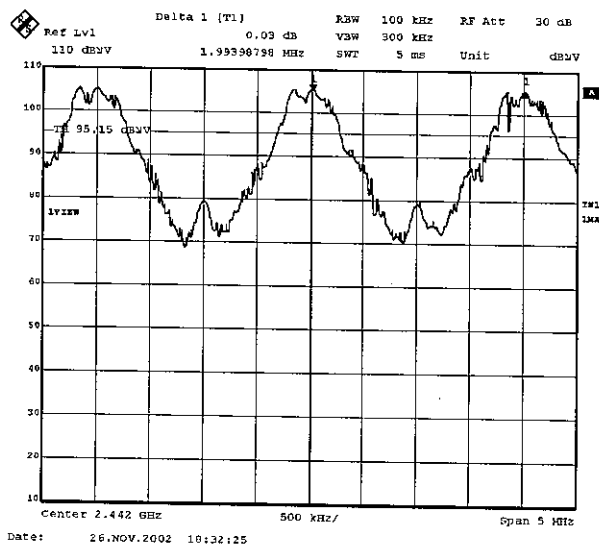
PHASE:N



Emission Level [dB μ V]

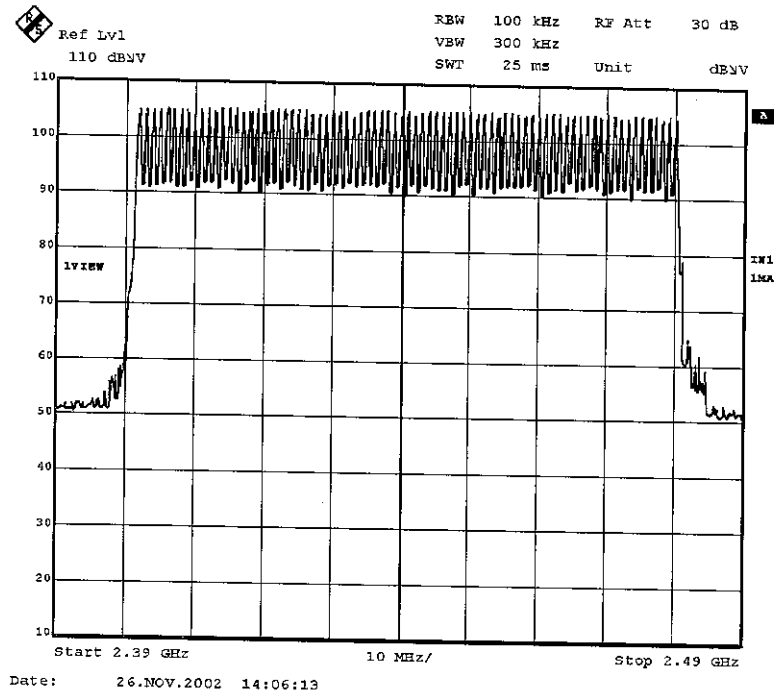
PHASE:L1



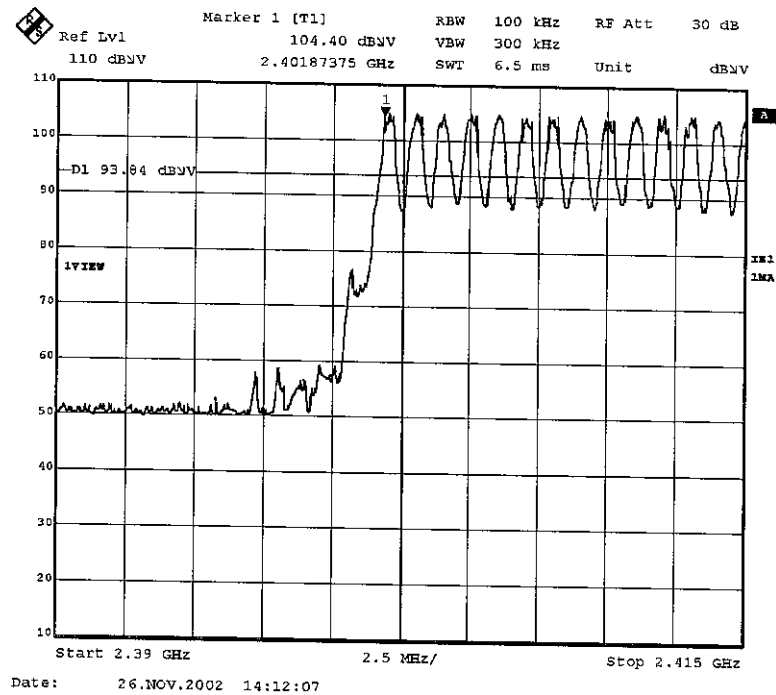
HoppingInquiryPage

Hopping

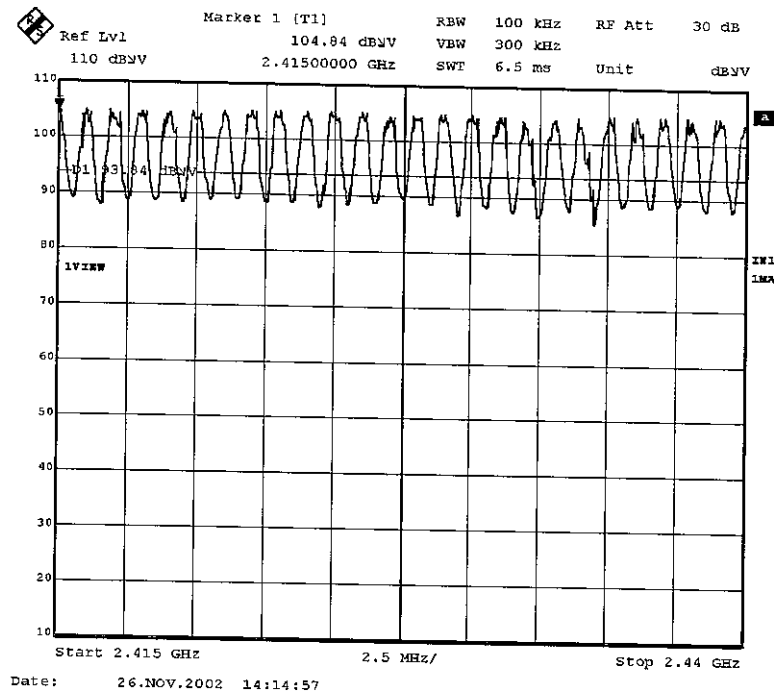
1.



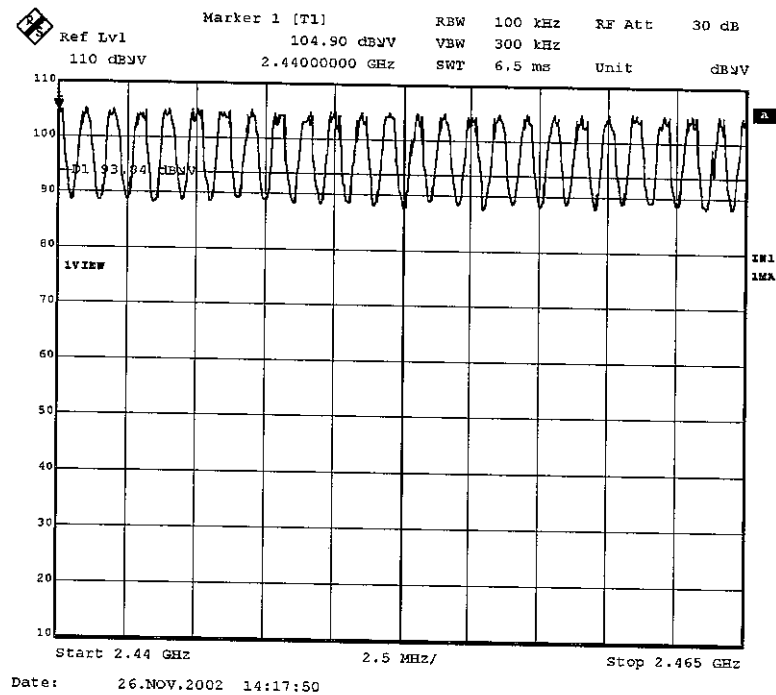
2.



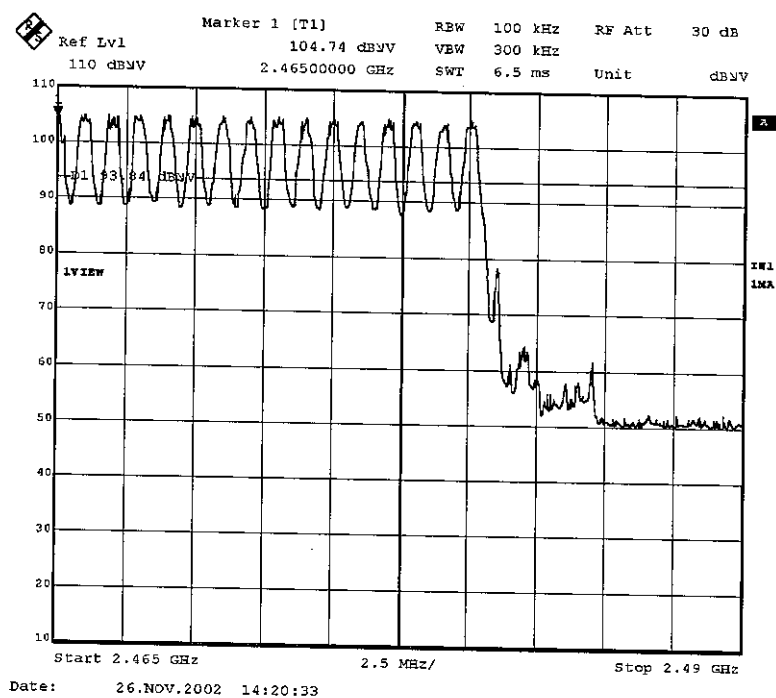
3.

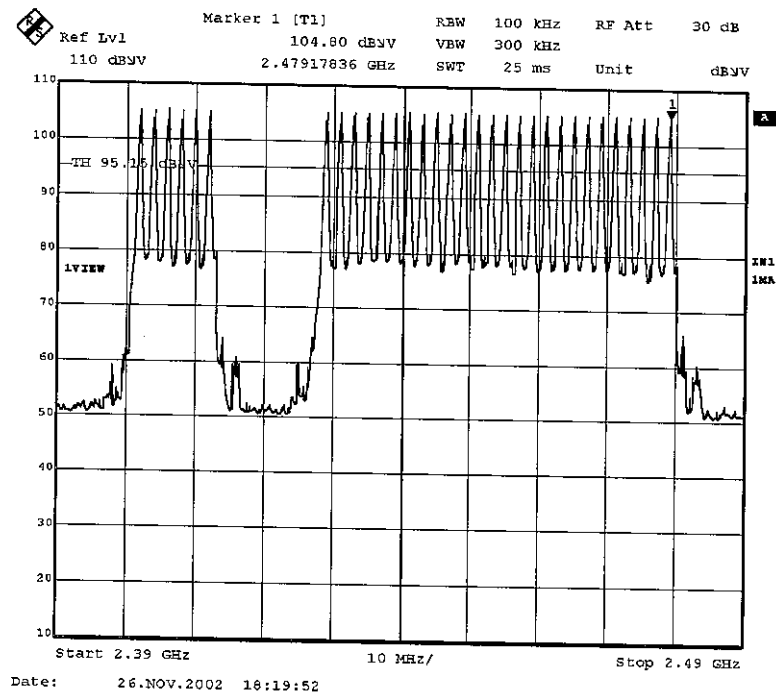
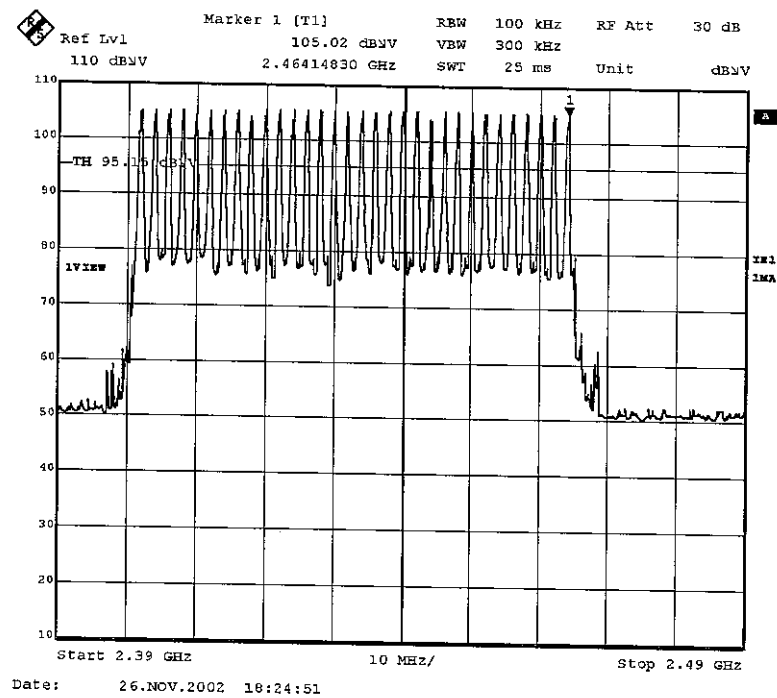


4.

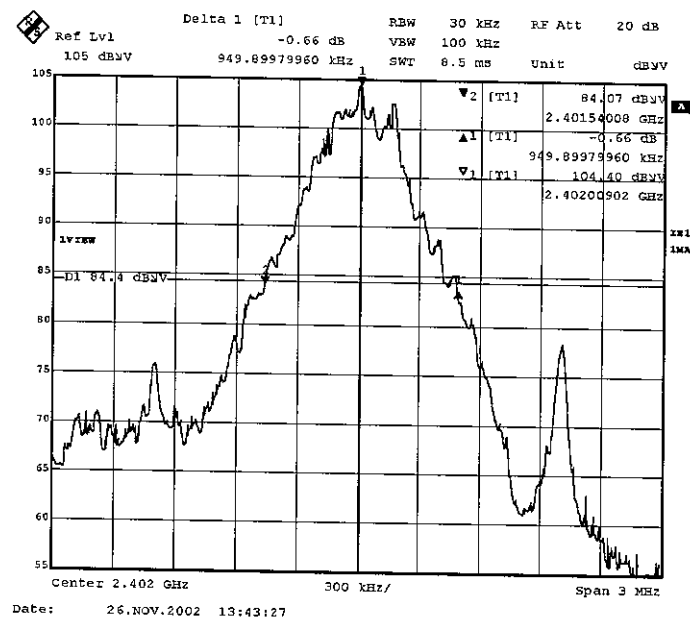


5.

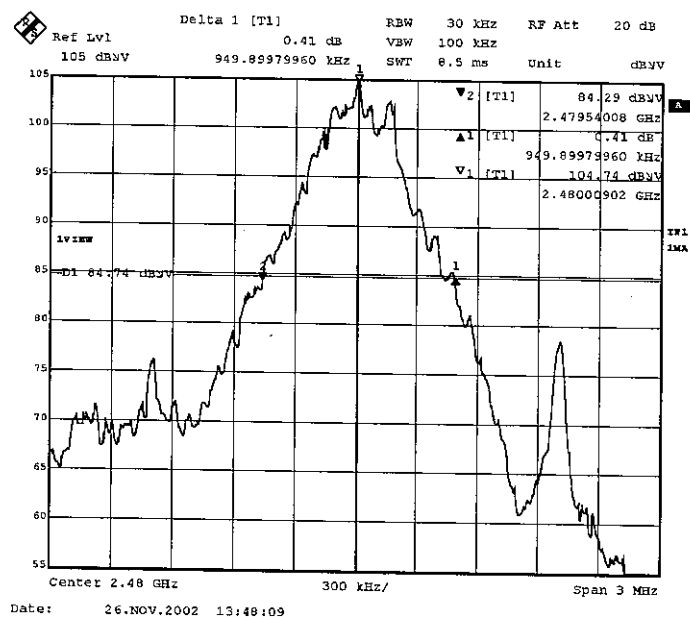


InquiryPage

1. ch Low: 2402MHz

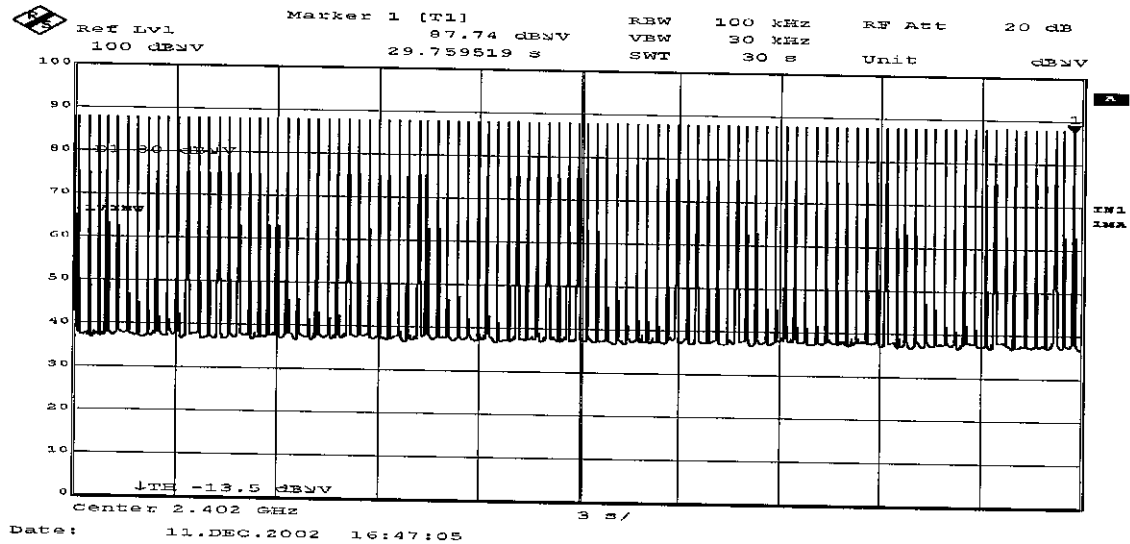


2. ch High: 2480MHz

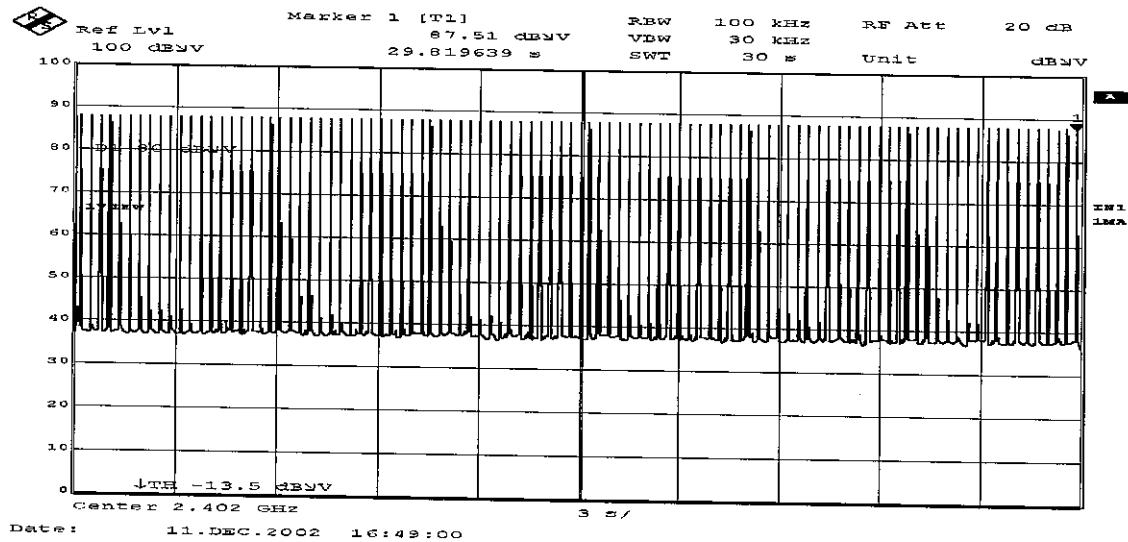


Dwell Time(Hopping)

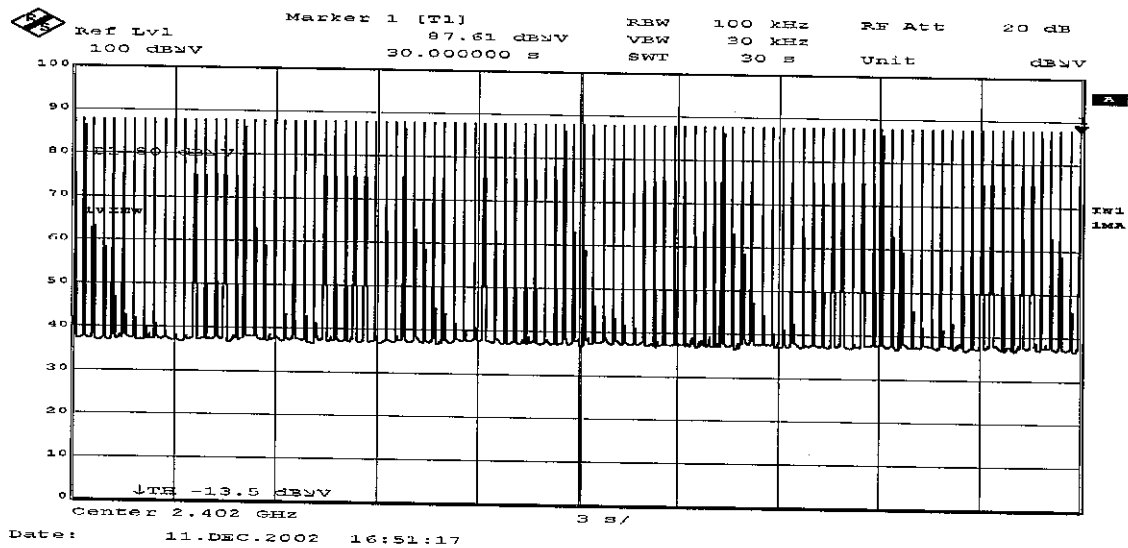
Count 1



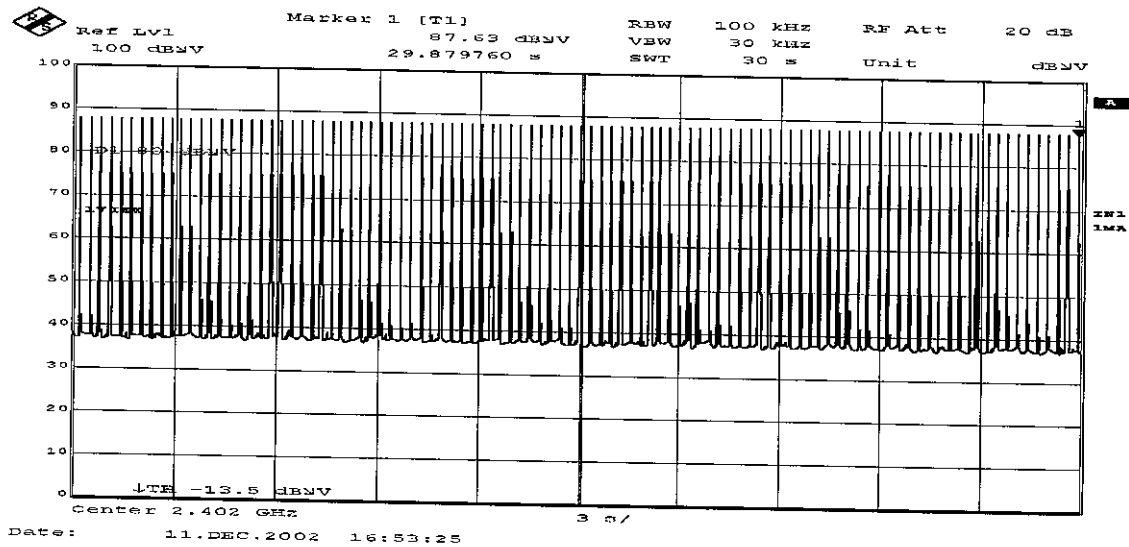
Count 2



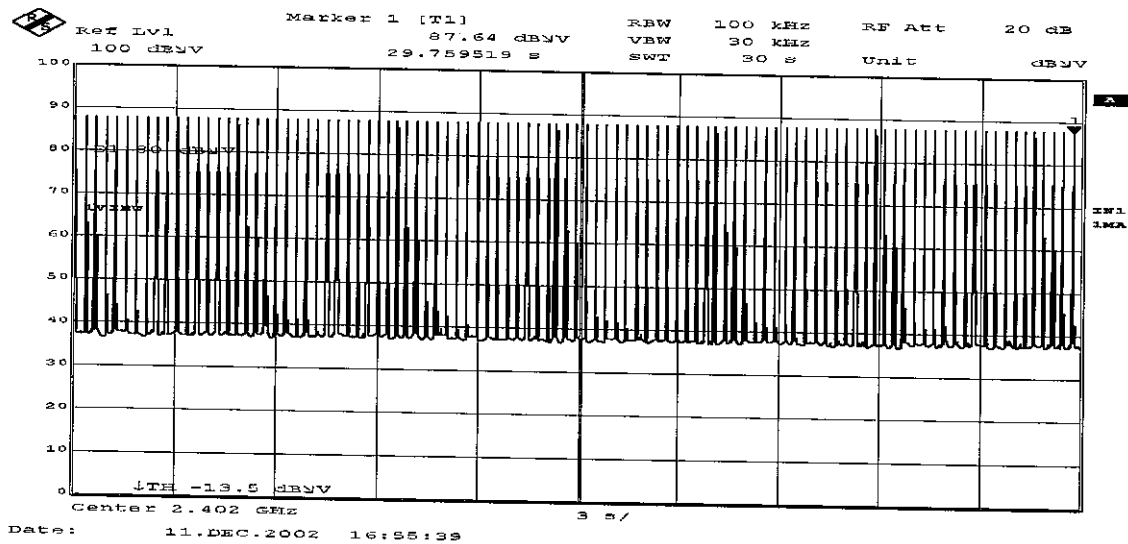
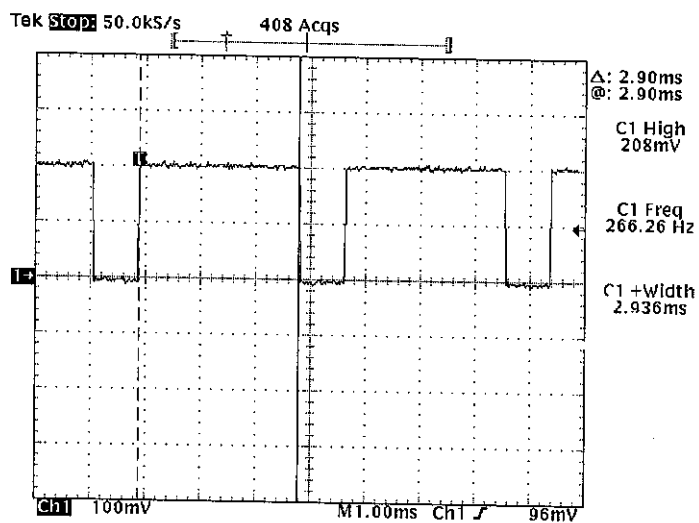
Count 3



Count 4



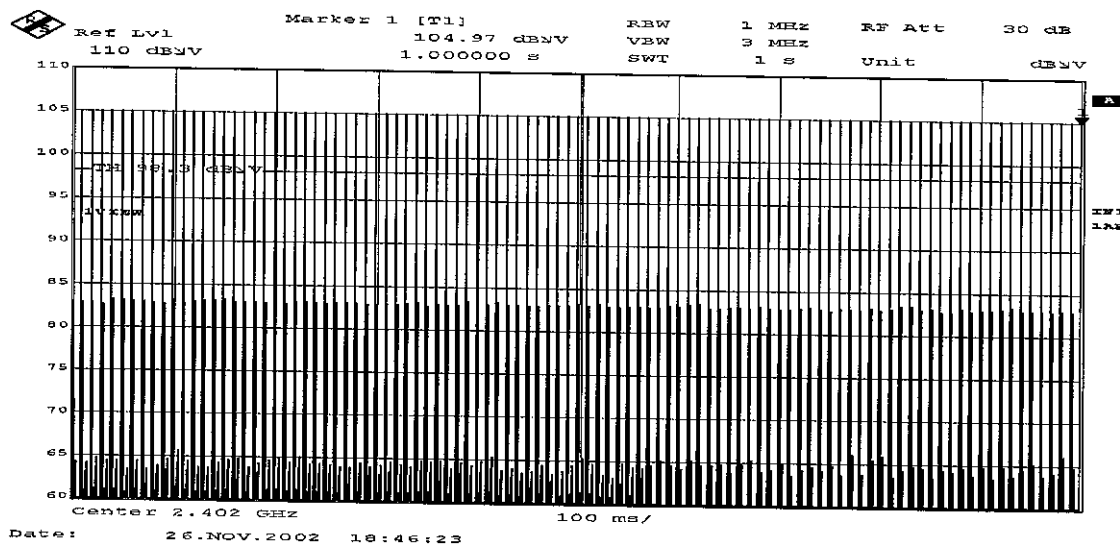
Count 5

Duty cycle(Hopping)

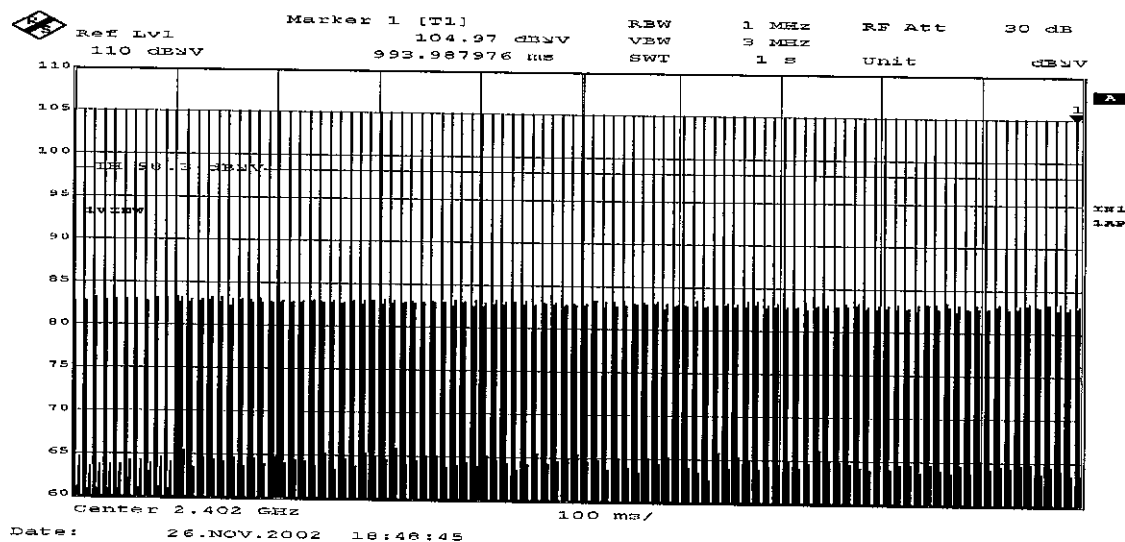
$$\begin{aligned}
 \text{Dwell time} &= (\text{Count 1} + \text{Count 2} + \text{Count 3} + \text{Count 4} + \text{Count 5}) / 5 * T_{\text{on}} \\
 &= (102 + 102 + 102 + 101 + 101) / 5 * 2.90[\text{ms}] \\
 &= 294.64 [\text{ms}]
 \end{aligned}$$

Dwell Time(Inquiry)

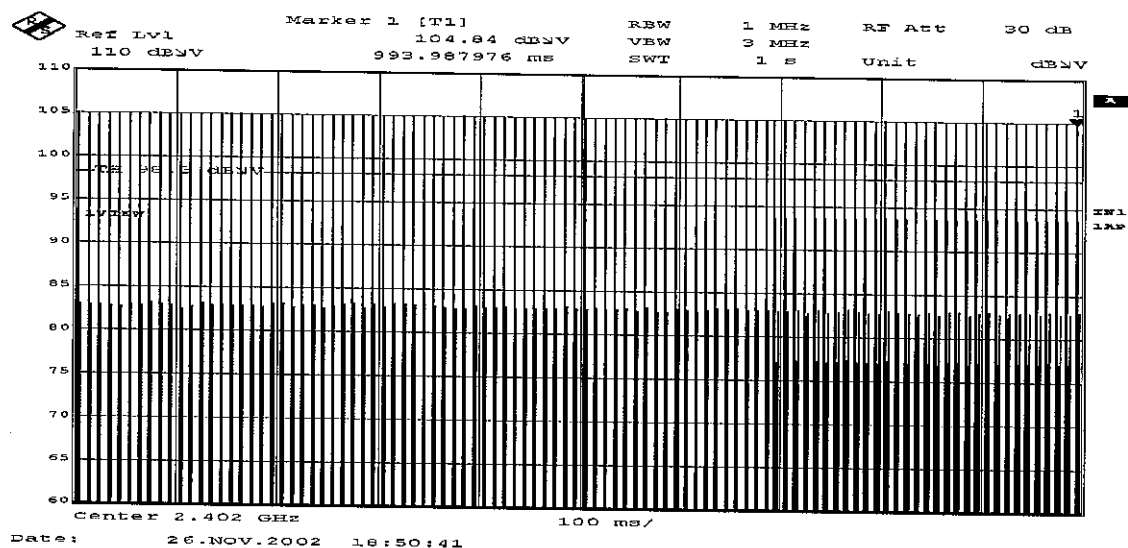
Count 1



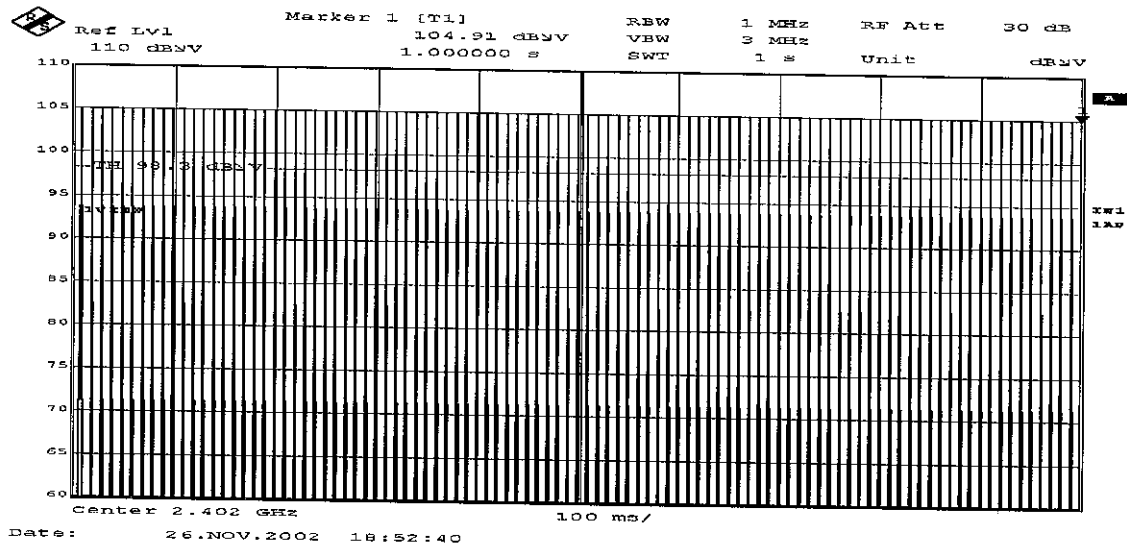
Count 2



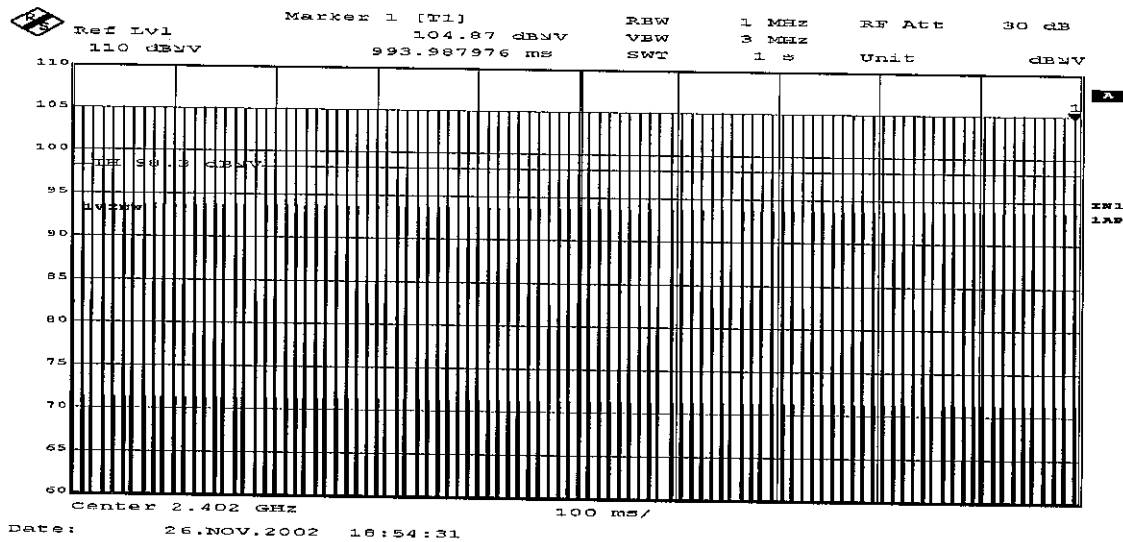
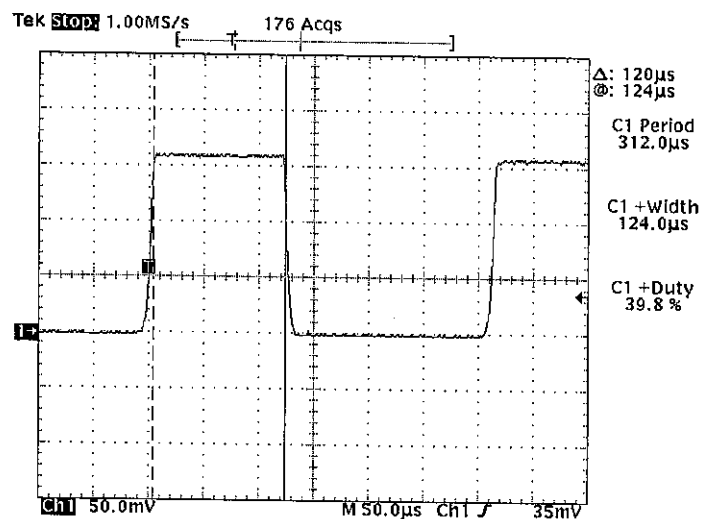
Count 3



Count 4



Count 5

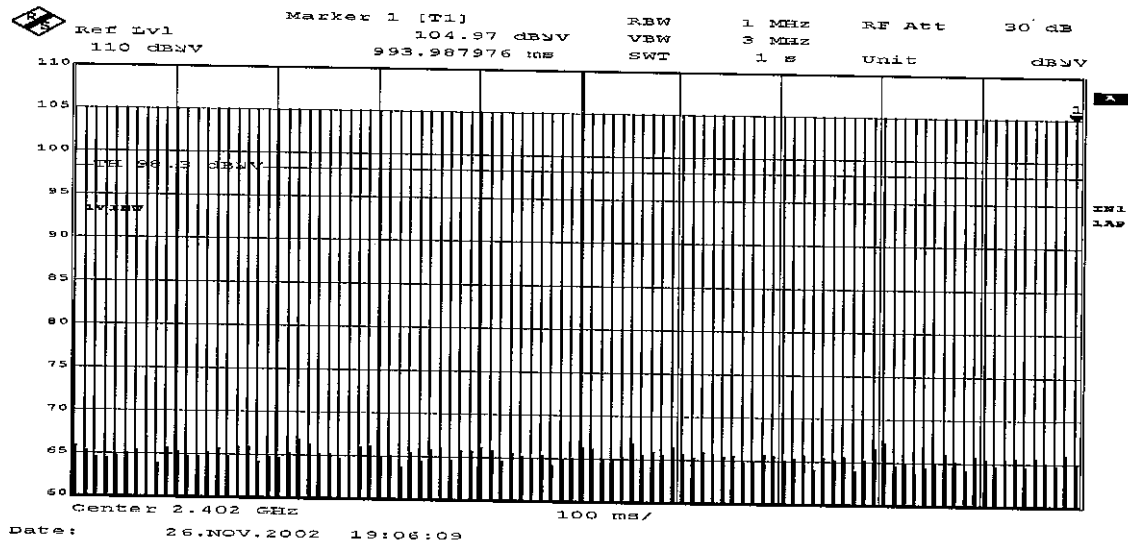
Duty cycle(Inquiry)

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

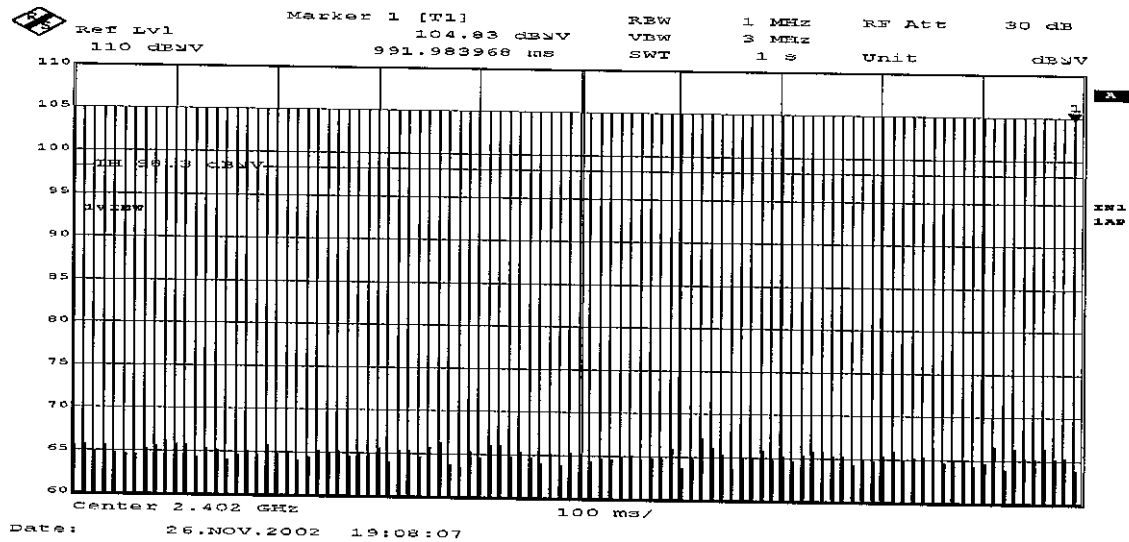
$$\text{Note. } 0.4x = 0.4 * 32ch = 12.8[s]$$

Dwell Time(Page)

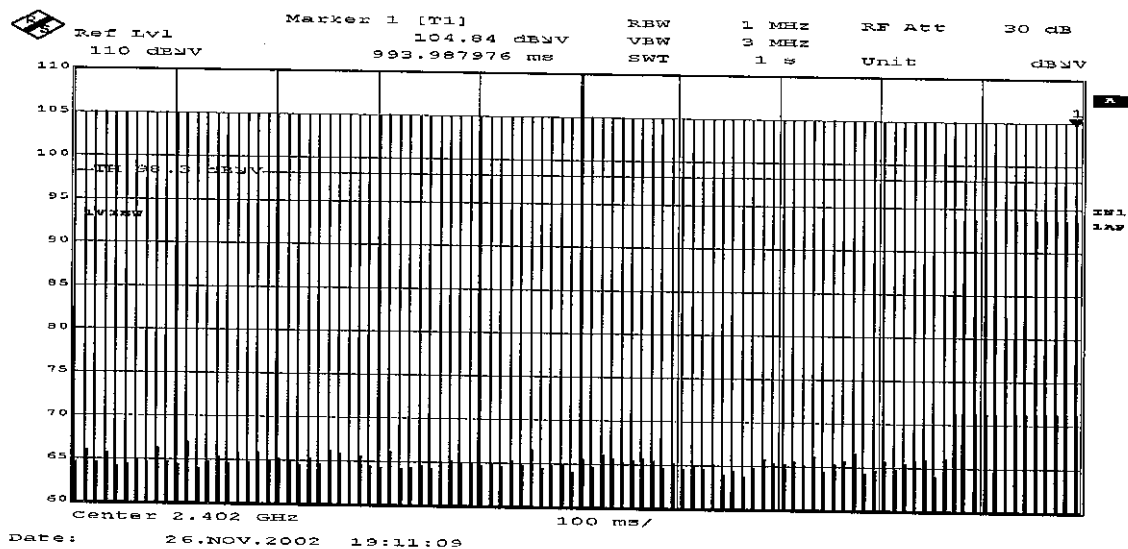
Count 1



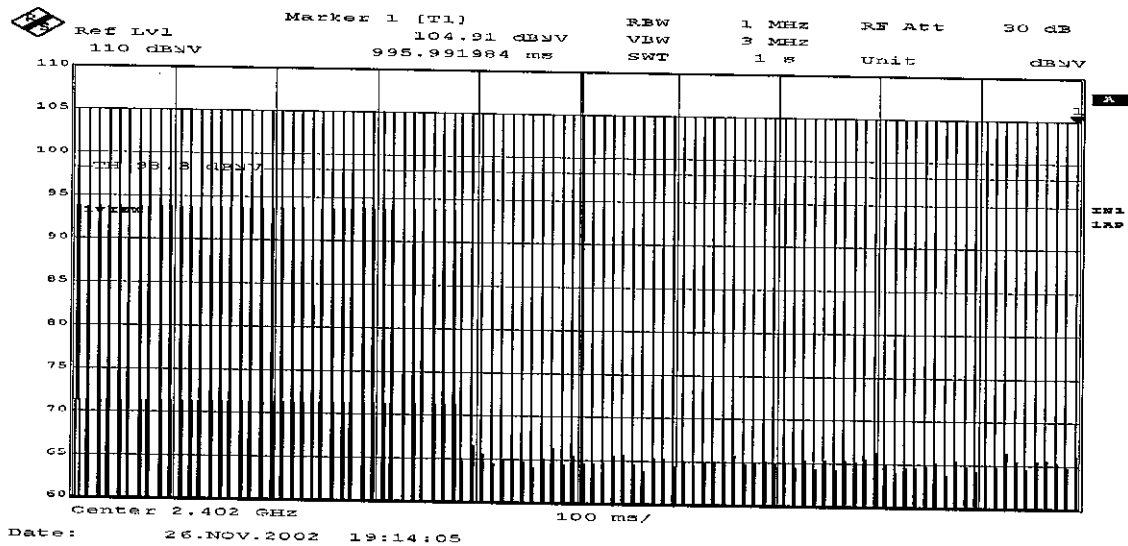
Count 2



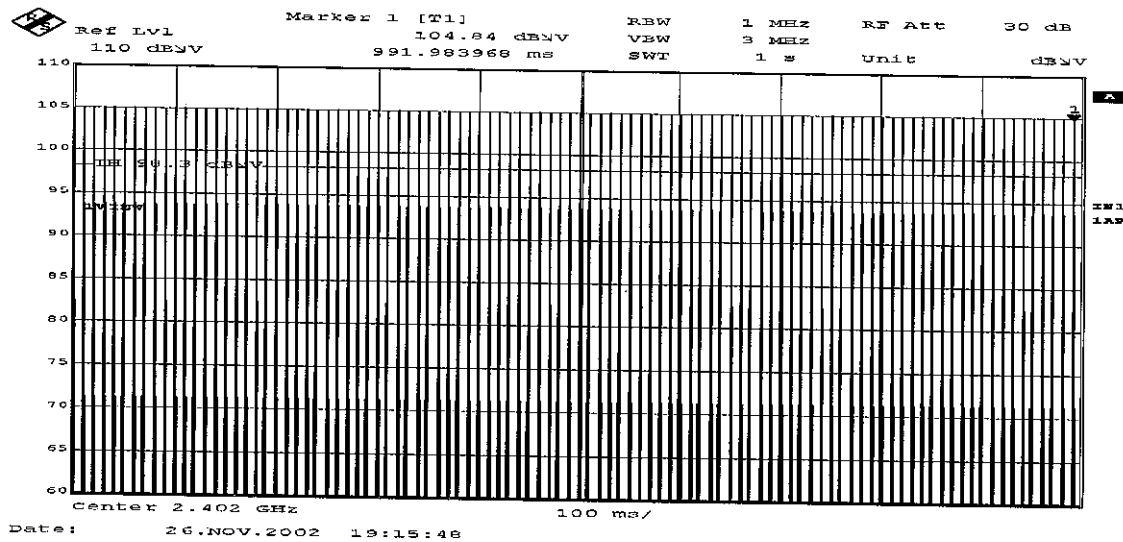
Count 3



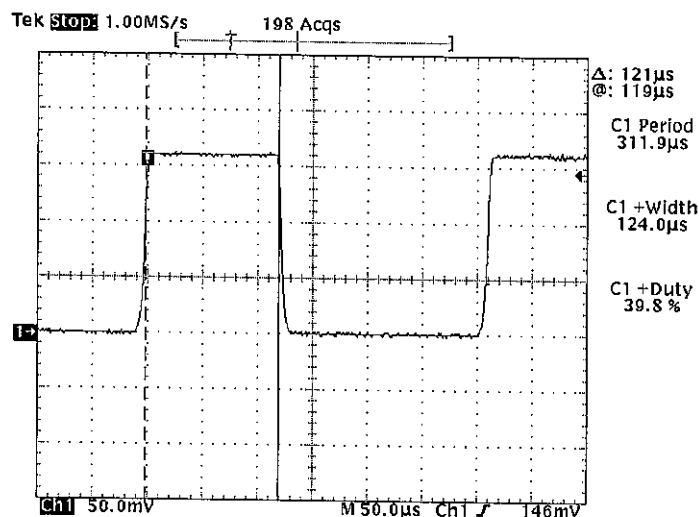
Count 4



Count 5



Duty cycle(Page)



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

$$\text{Note. } 0.4x = 0.4 * 32ch = 12.8[s]$$

Peak Out Put Power (Conducted)

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

COMPANY : Alps Electric Co Ltd.
EQUIPMENT : Bluetooth Transceiver Module
MODEL : UGPZ3
FCC ID : CWTUGPZ3
POWER : DC3.3V (PC:AC120V/60Hz)
Mode : Transmitting

REPORT NO : 23DE0002-YK-1
REGULATION : Fcc Part15SubpartC 247 (b) (1)
DATE : 2002/ 11/26
Temp. /Humi. : 20°C/51%


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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
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 μV] + 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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
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: $\text{READING}[\text{dB } \mu\text{V}] + \text{ANT. FACTOR}[\text{dB/m}] + \text{CABLE LOSS}[\text{dB}] - \text{AMP. GAIN}[\text{dB}] + \text{ATTEN}[\text{dB}]$.

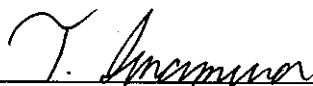
■ANTENNA:KBA-01 (BBA9106) 30-299.99MHz/KLA-01 (USLP9143) 300-1000MHz

■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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2390.00	BB	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 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(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 [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
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 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: 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 [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	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

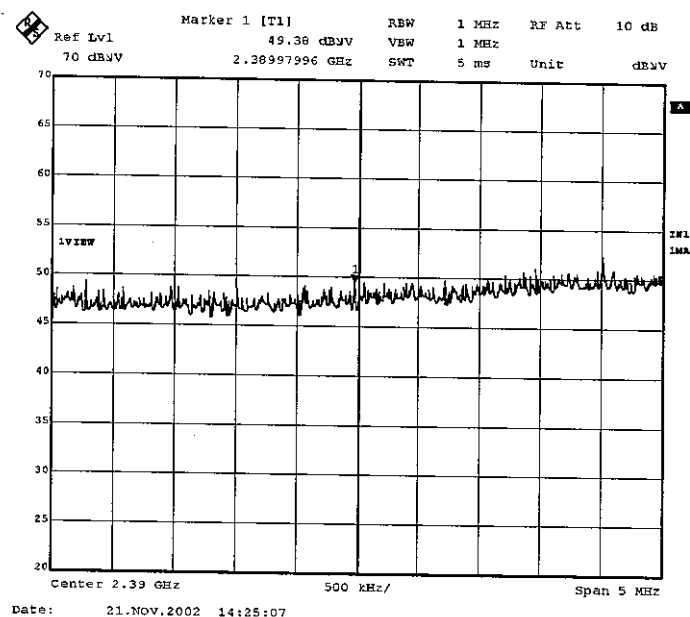
CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■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)

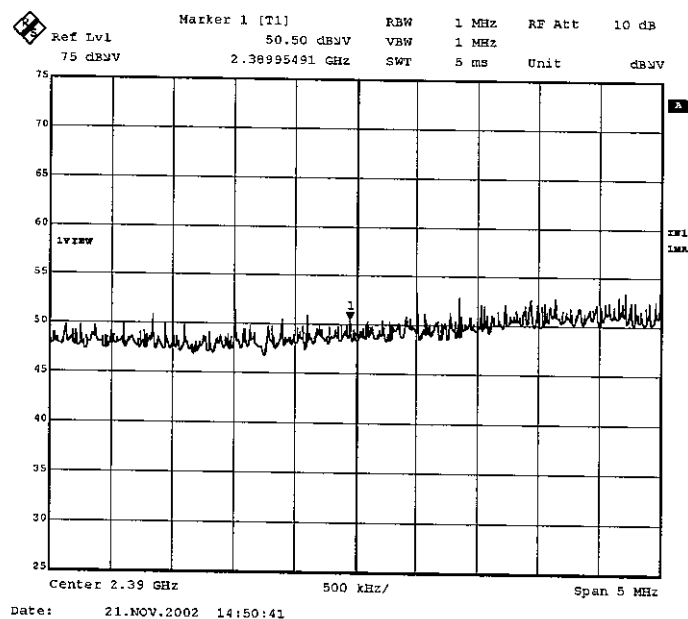
Antenna Type:YCE-5255

2.39GHz (Ch :2402MHz)

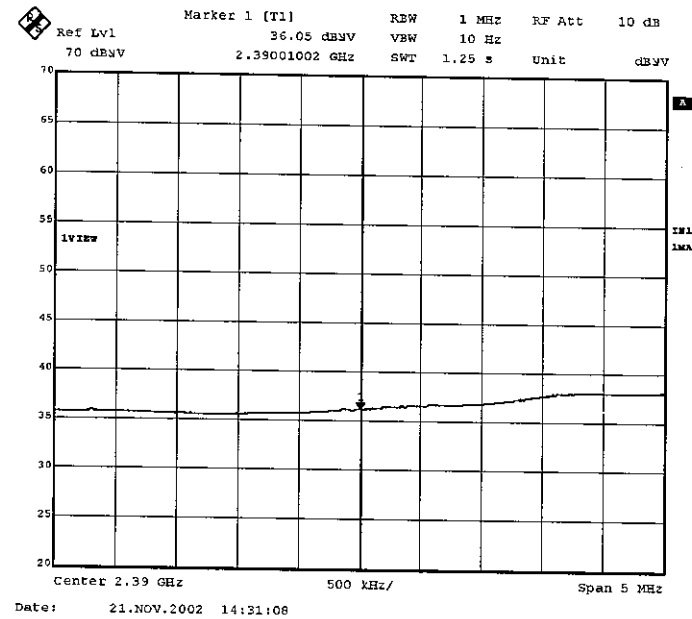
1. Horizontal/ PK



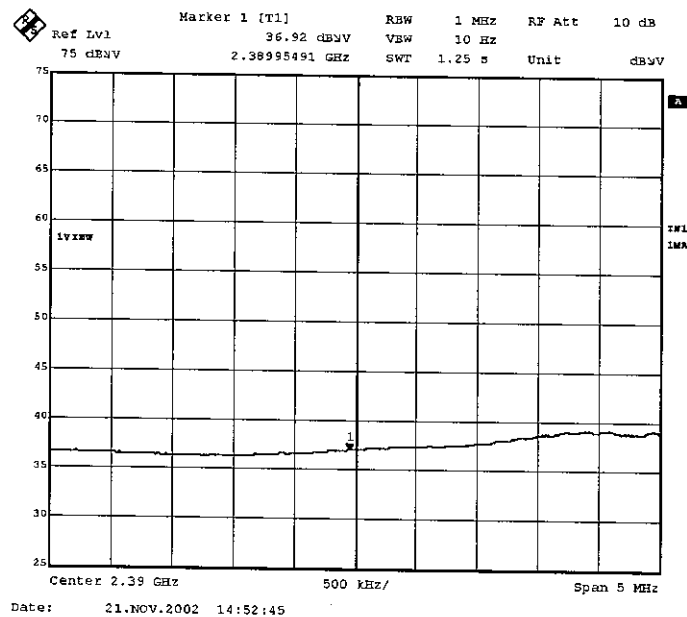
2. Vertical/ PK

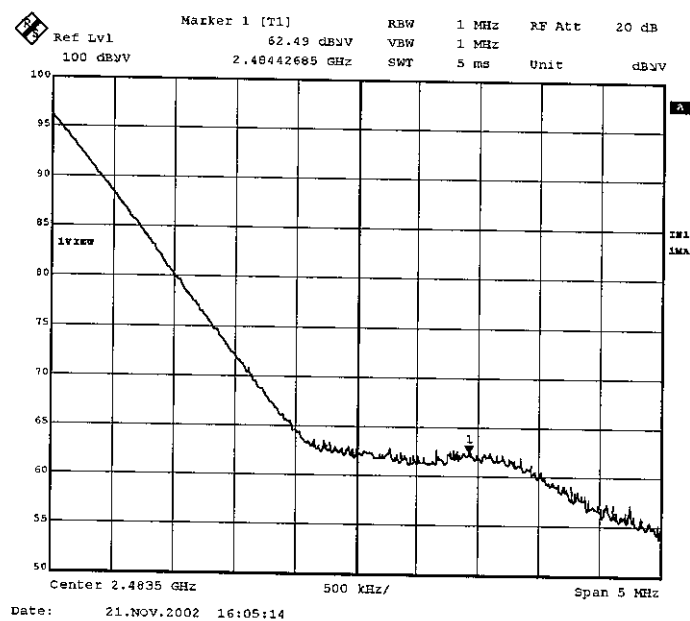
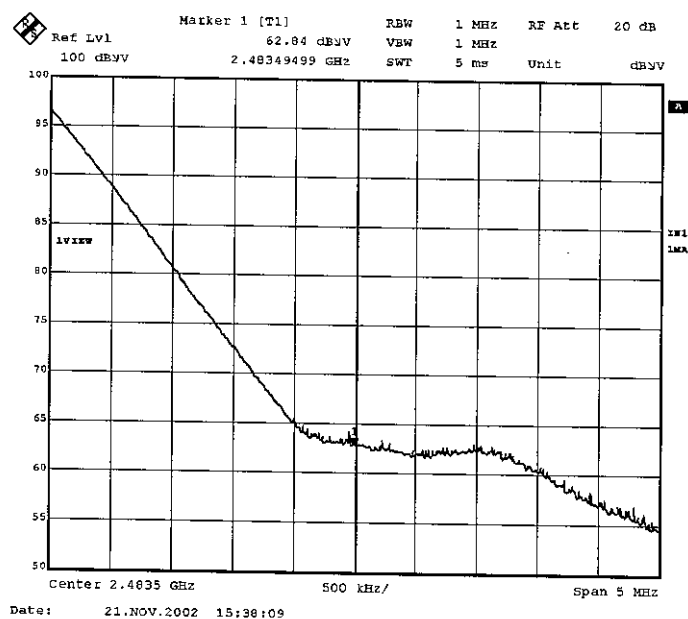


3. Horizontal/ AV

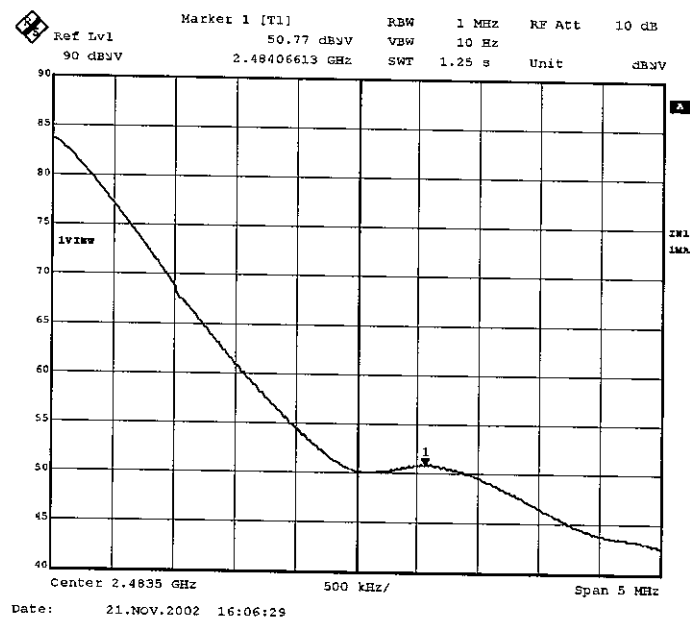


4. Vertical/ AV

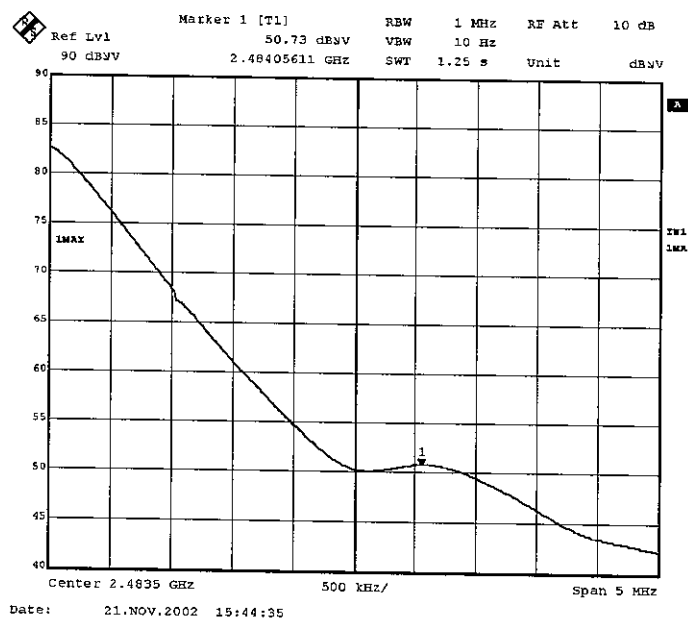


2.4835GHz (Ch :2480MHz)1. Horizontal/PK2. Vertical/PK

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 [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
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 μ 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 [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
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 μ 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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2390.00	BB	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 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: 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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	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 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: 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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2390.00	BB	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 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)

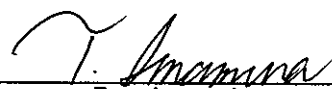
DATA OF RADIATION TEST

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: 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 μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	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

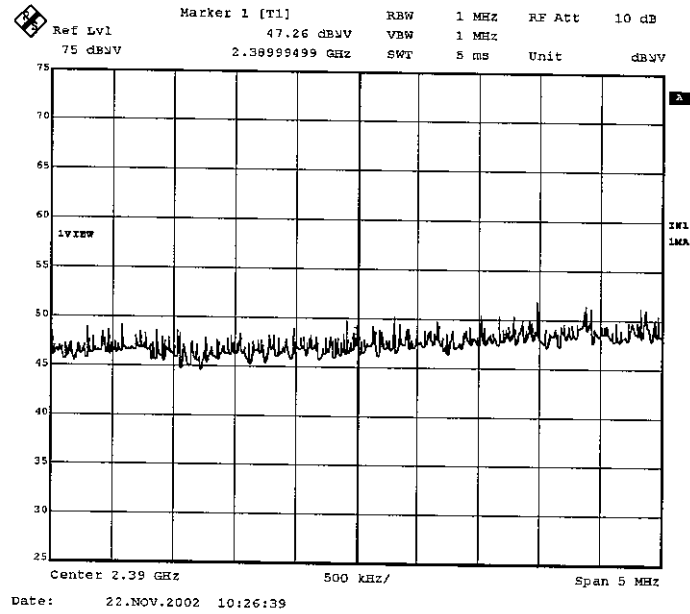
CALCULATION: READING[dB μV] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ 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)

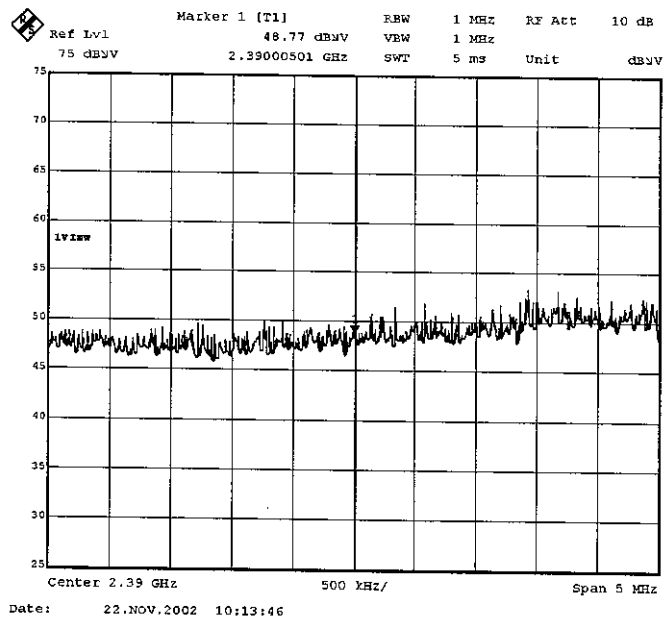
Antenna Type:SSW2400

2.39GHz (Ch :2402MHz)

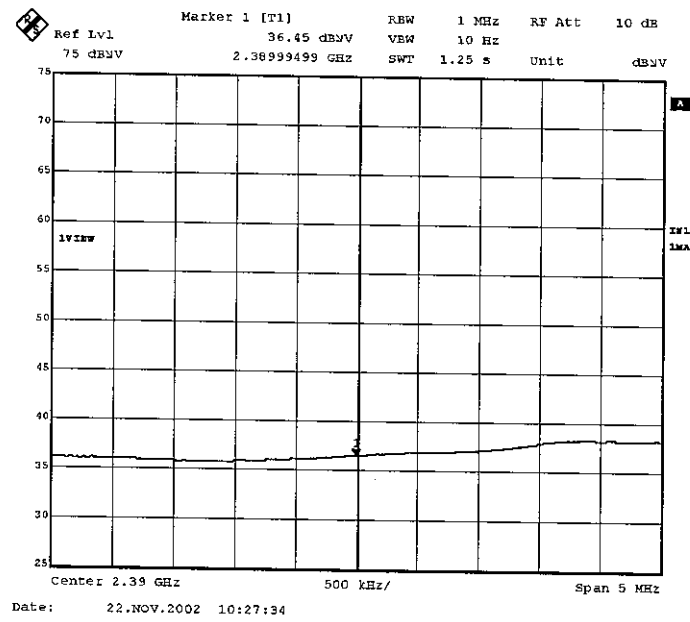
1. Horizontal/PK



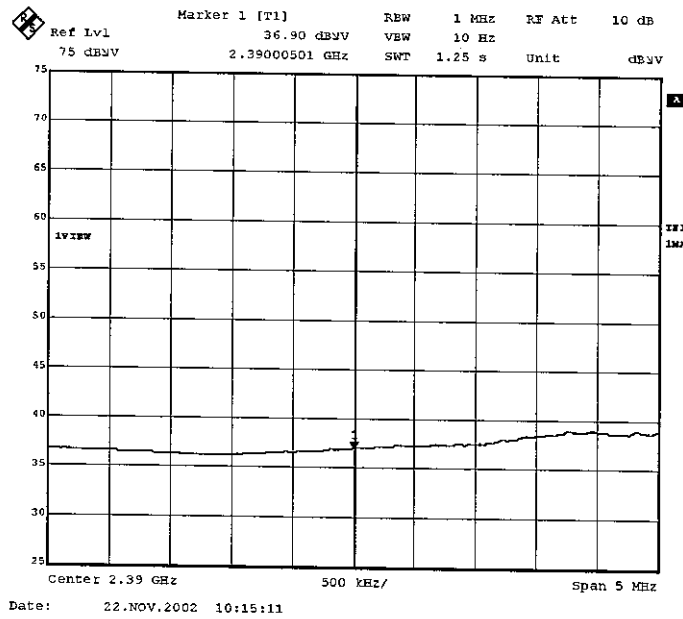
2. Vertical/PK



3. Horizontal/ AV

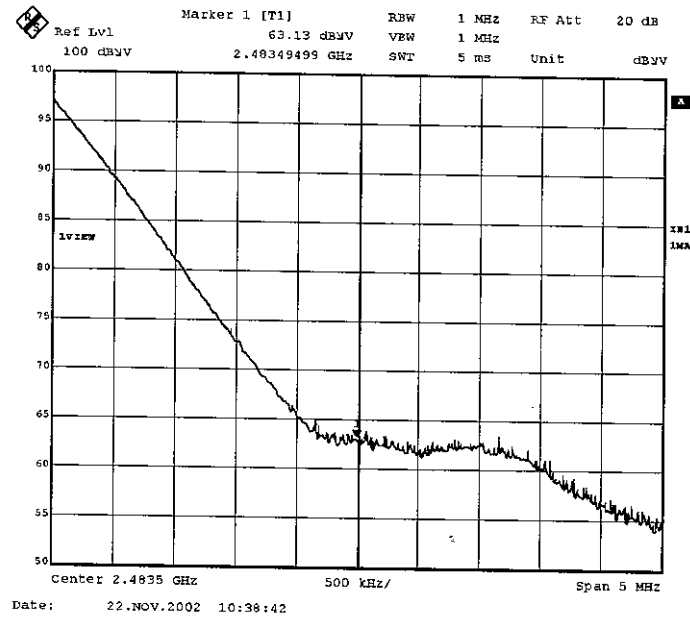


4. Vertical/ AV

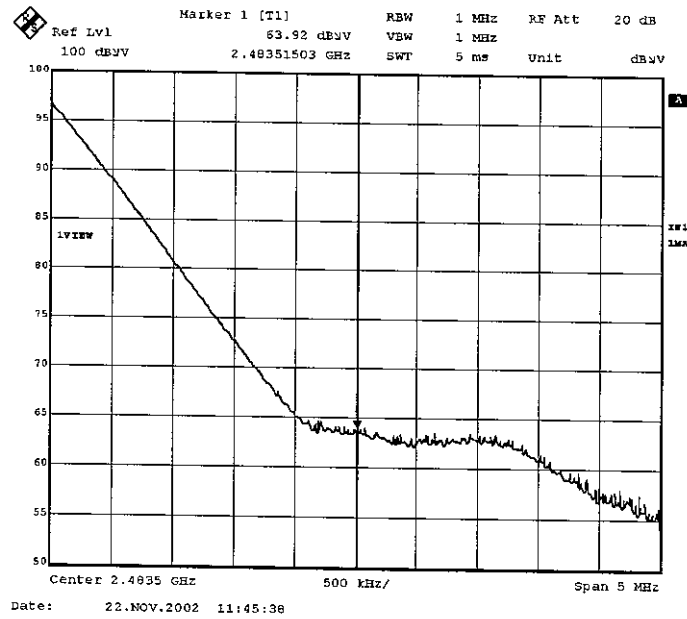


2.4835GHz (Ch :2480MHz)

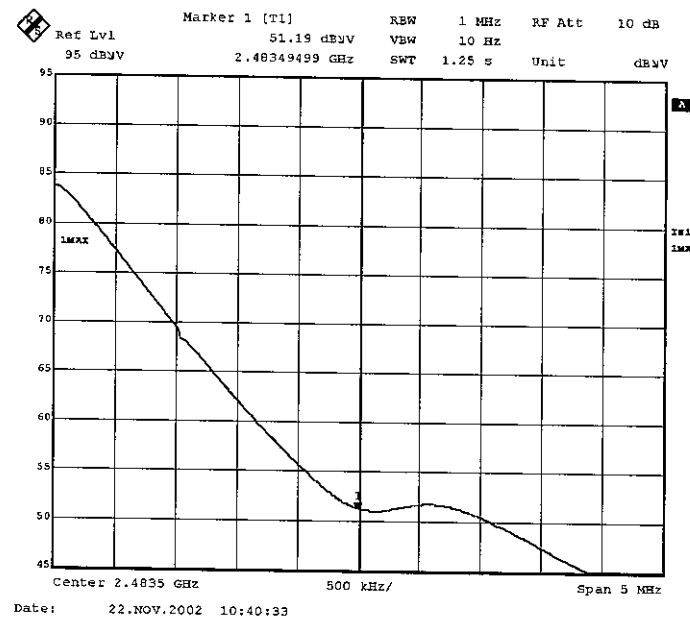
1. Horizontal/PK



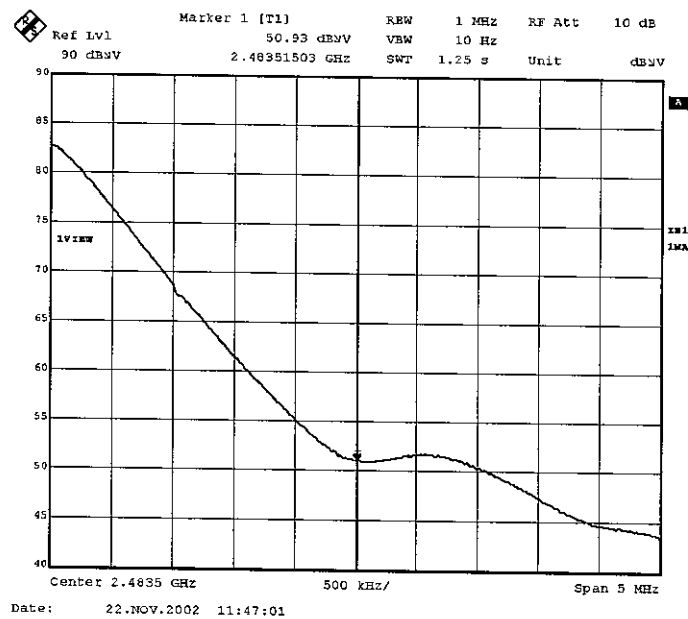
2. Vertical/PK



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 [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
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 μV] + 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 (ESI40)

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 [dB μV/m]	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 μV] + 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 [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
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)

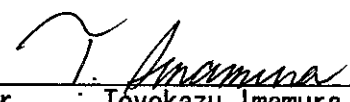
DATA OF RADIATION TEST

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 [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	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 [dB μ V]					HOR [dB μ V/m]	VER [dB μ V/m]		HOR [dB]	VER [dB]
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 [dB μV/m]	MARGIN	
			HOR [dB μV]	VER [dB μV]					HOR [dB μV/m]	VER [dB μV/m]		HOR [dB]	VER [dB]
1.	2483.50	BB	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].

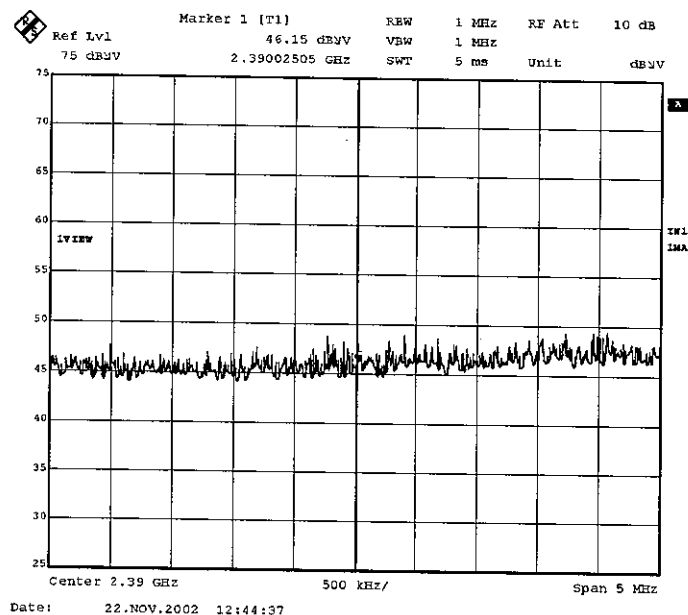
■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz/KHA-03 (3160-09) 18-26.5GHz

■ CABLE: KCC-D3 ■ PREAMP: KAF-02 (8449B) ■ EMI RECEIVER: KTR-01 (ES140)

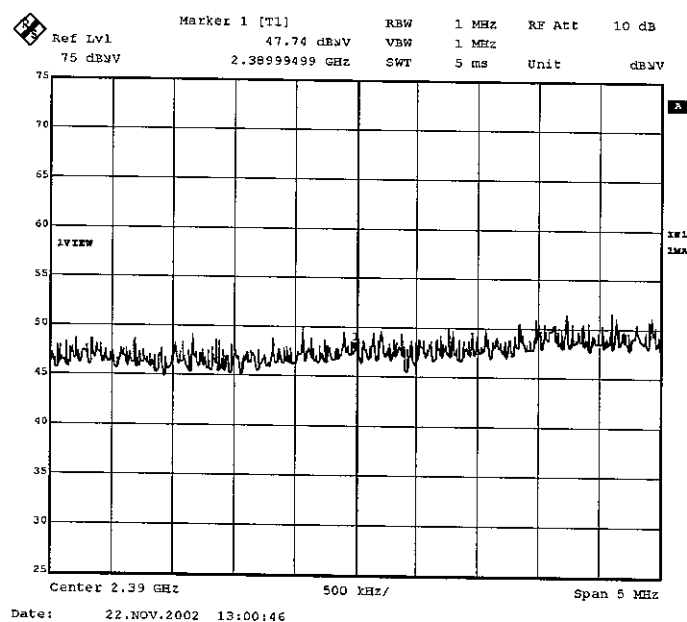
Antenna Type:LDA92

2.39GHz (Ch :2402MHz)

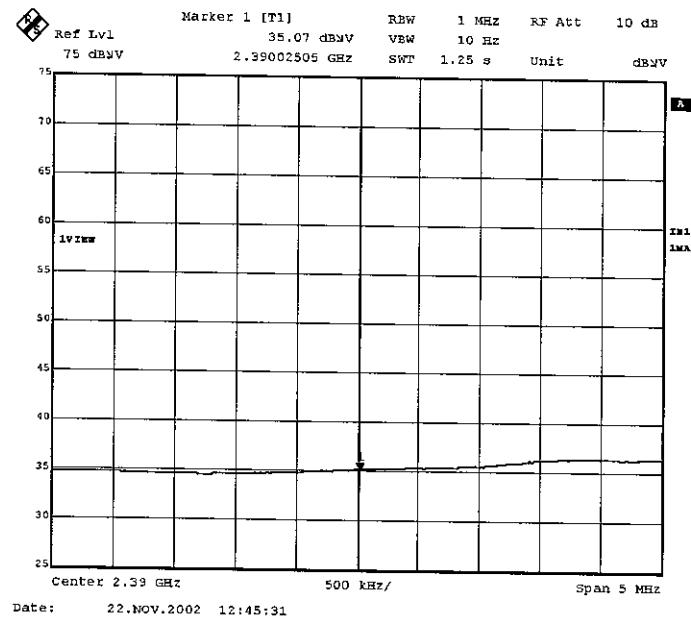
1. Horizontal/ PK



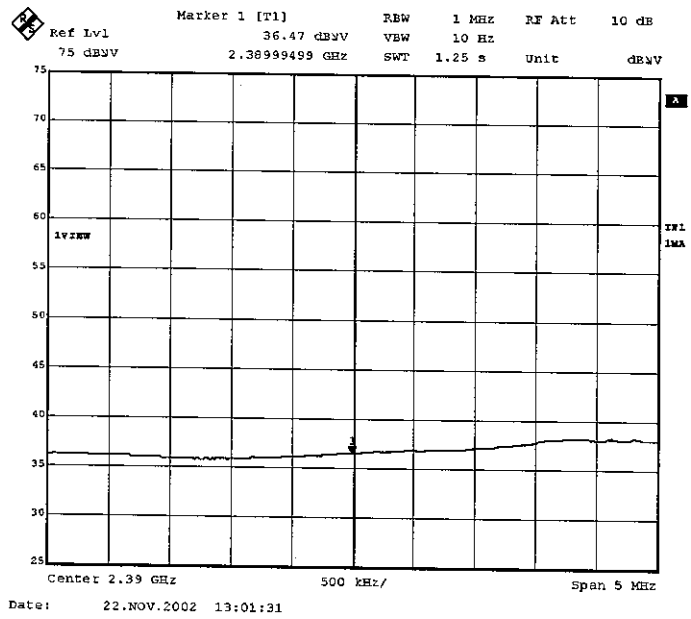
2. Vertical/ PK



3. Horizontal/ AV

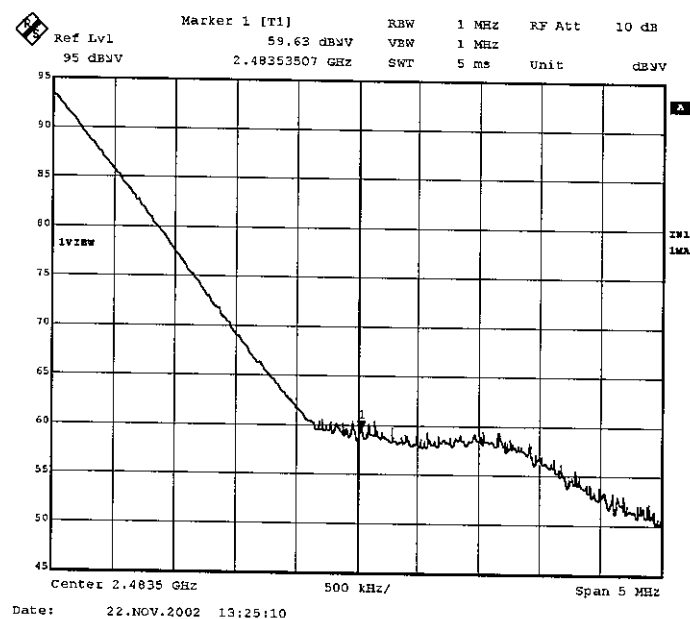


4. Vertical/ AV

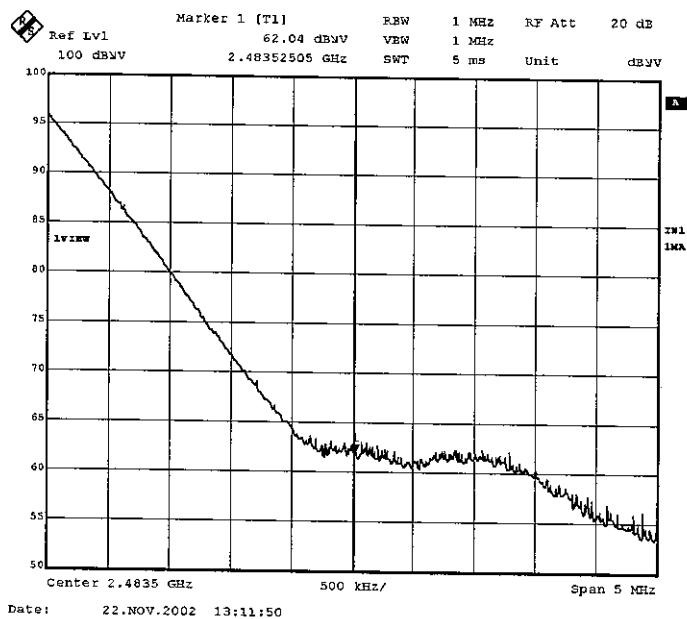


2.4835GHz (Ch :2480MHz)

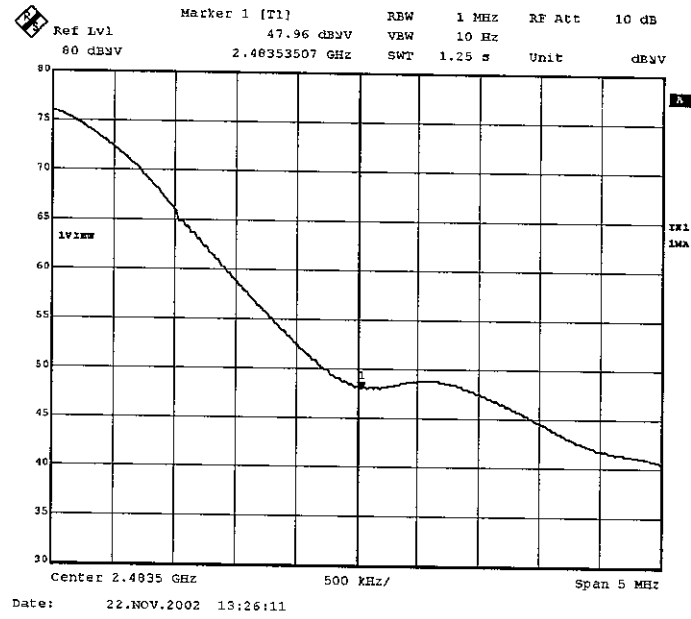
1. Horizontal/ PK



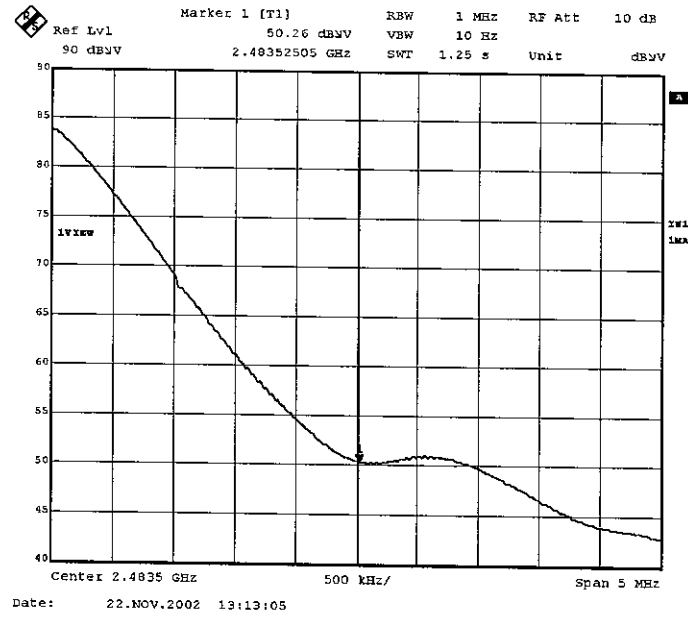
2. Vertical/ PK



3. Horizontal/ AV

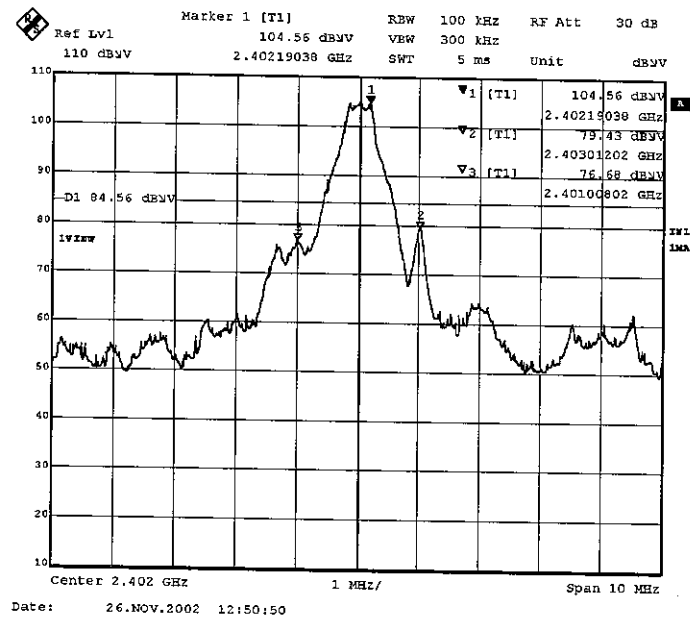


4. Vertical/ AV

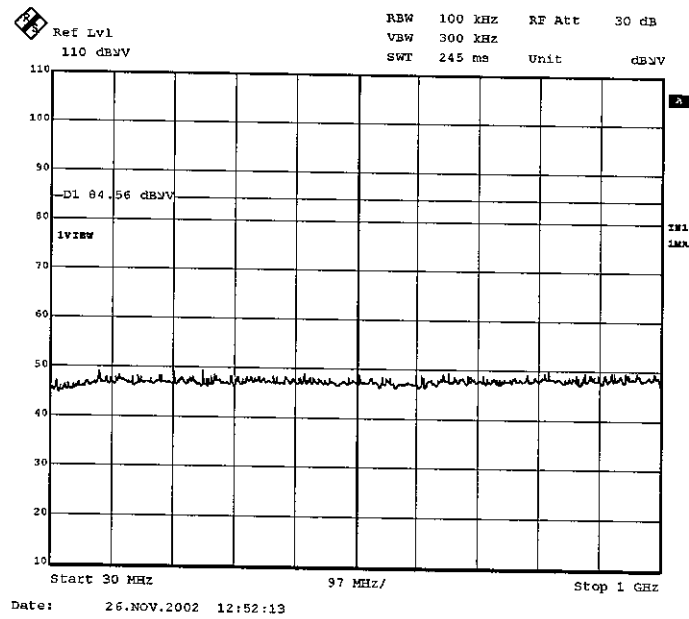


Ch Low: 2402MHz

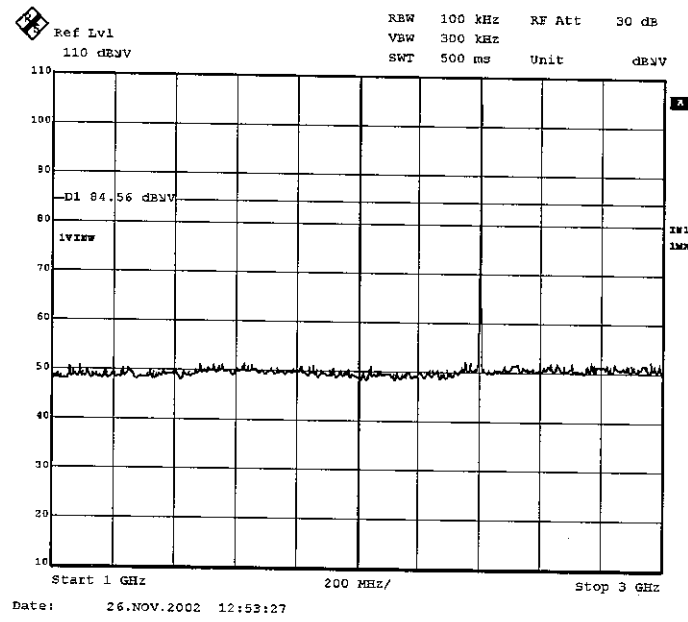
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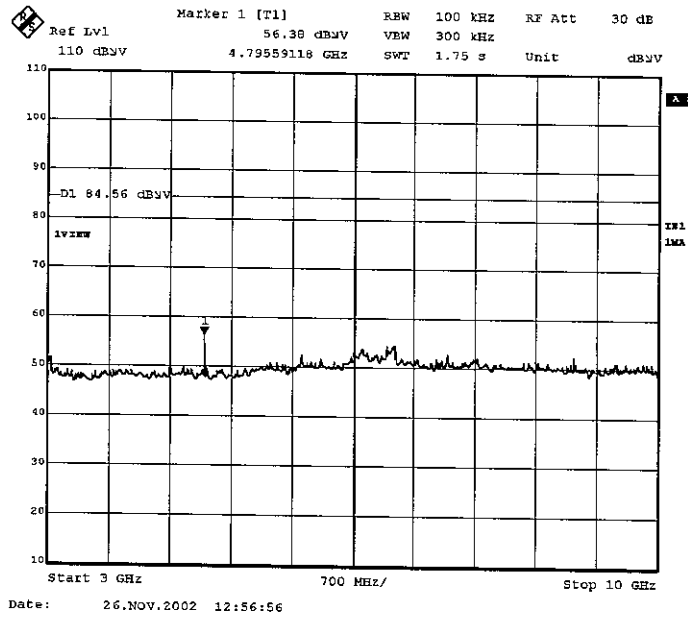
2.



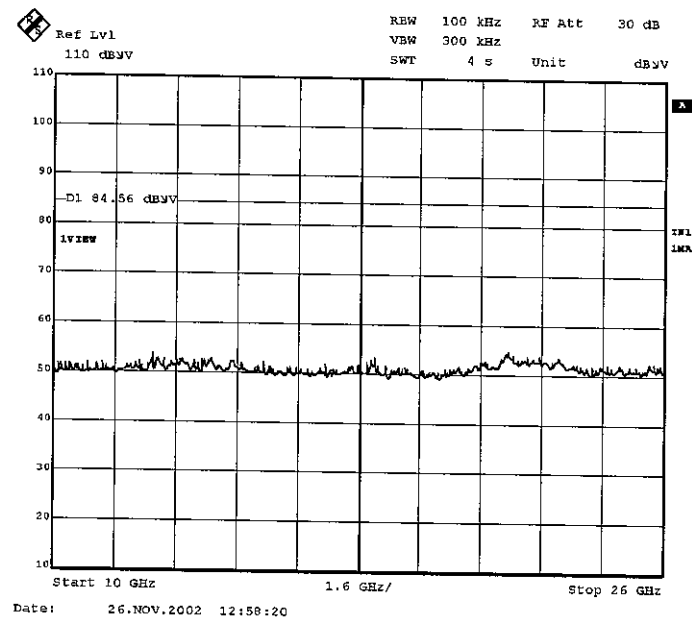
3.



4.

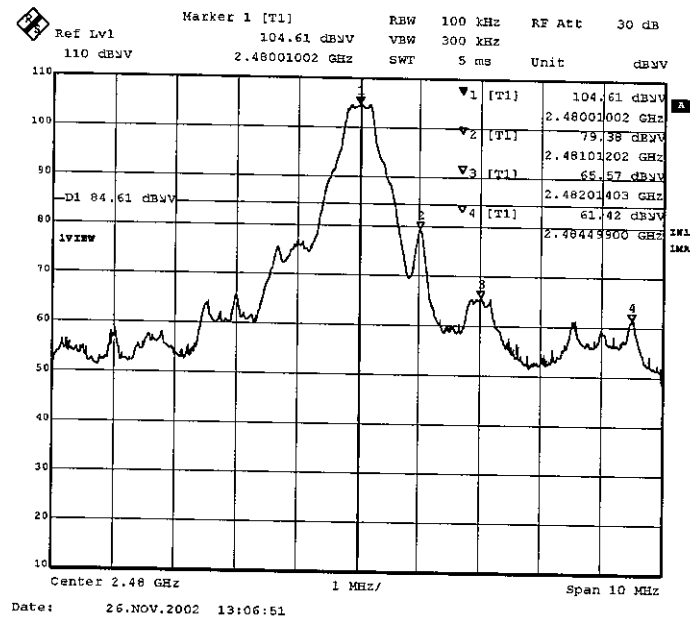


5.

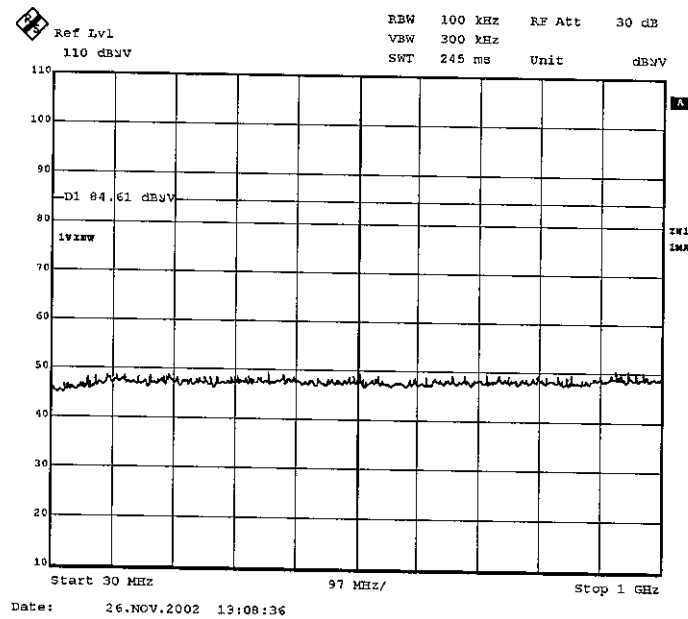


Ch High: 2480MHz

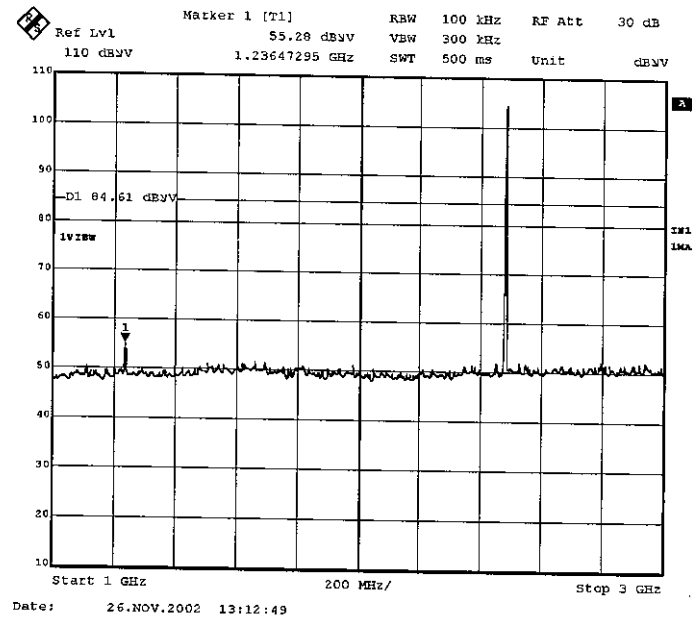
1.



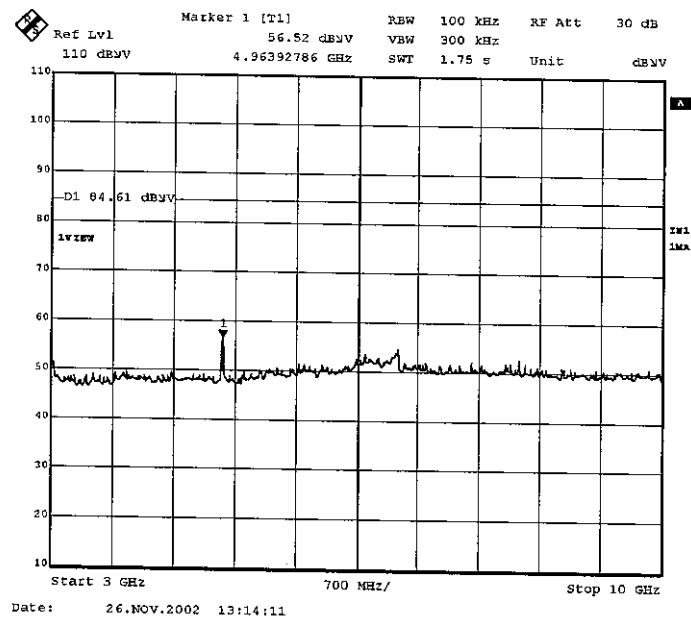
2.



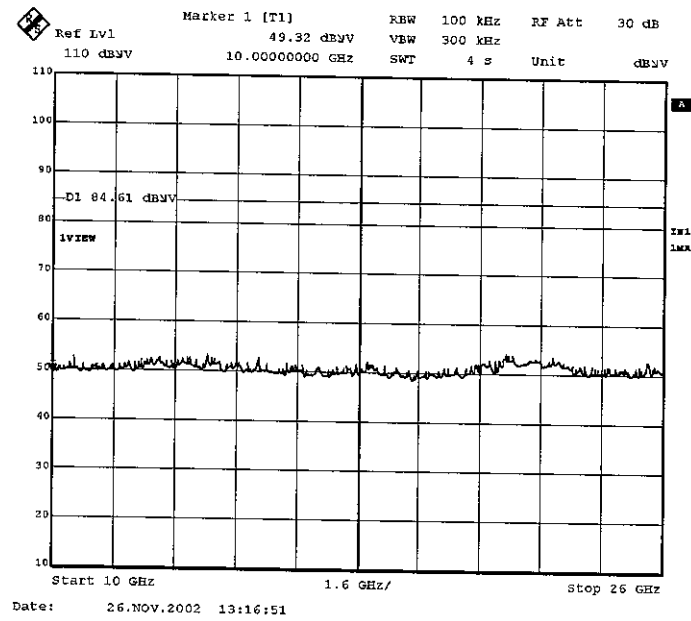
3.



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/S04272B/S04272B	RE	2002/08/17 * 12
KCC-14/15/16/18/KPL-01	Coaxial Cable/Pulse Limiter	Fujikura/Suhner/PMM	5D-2W/8D-2W/S04272B/S04272B/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