# APPLICATION FOR CERTIFICATION

On Behalf of

Futaba Corporation

Radio Control

Model No.：PK-FSM-2.4G

FCC ID：AZPPK-FSM-24G

Brand : Futaba

Prepared for : Futaba Corporation
1080 Yabutsuka Chosei-son Chosei-gun
Chiba, 299-4395 Japan.

Prepared by : Audix Corporation
Technical Division EMC Department
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei County, Taiwan, R.O.C.

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Fax: (02) 2609-9303

| | | |
|---|---|---|
| File Number | ： | EM950544 |
| Report Number | ： | EM-F950142 |
| Date of Test | ： | Apr. 21 ~ 22, 2006 |
| Date of Report | ： | May 05, 2006 |

# TABLE OF CONTENTS

# TEST REPORT CERTIFICATION

| | | |
|---|---|---|
| Applicant | : | Futaba Corporation |
| Manufacturer | : | Futaba Corporation |
| EUT Description | : | Radio Control |
| FCC ID | : | AZPPK-FSM-24G |
| | (A) MODEL NO. | : PK-FSM-2.4G |
| | (B) SERIAL NO. | : N/A |
| | (C) BRAND | : Futaba |
| | (D) POWER SUPPLY | : DC 9.6V |
| | (E) TEST VOLTAGE | : DC 9.6V (DC Power Supply) |

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, FEBRUARY 2006
AND ANSI C63.4/2003

(FCC CFR 47 Part 15C, §15.205, §15.207, §15.209 and §15.247)

The device described above was tested by AUDIX COPORATION to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and AUDIX CORPORATION is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX CORPORATION.

Date of Test: Apr. 21 ~ 22, 2006

Prepared by: Tina Huang May 10, 2006
(Tina Huang/Assistant)

Test Engineer: Ben Cheng May. 11, 2006
(Ben Cheng/Section Manager)

Approved & Authorized Signer: Leon Liu May. 11 2006
(Leon Liu/Senior Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

| | | |
|---|---|---|
| Description | : | Radio Control (Transmitter) |
| Model Number | : | PK-FSM-2.4G |
| Serial Number | : | N/A |
| Brand | : | Futaba |
| FCC ID | : | AZPPK-FSM-24G |
| Applicant | : | Futaba Corporation<br>1080 Yabutsuka Chosei-son Chosei-gun<br>Chiba, 299-4395 Japan. |
| Manufacturer | : | Futaba Corporation<br>1080 Yabutsuka Chosei-son Chosei-gun<br>Chiba, 299-4395 Japan. |
| Radio Technology | : | DSSS Modulation |
| Frequency Band | : | 2405.376MHz ~ 2479.104MHz |
| Tested Frequency | : | 2405.376MHz (Channel 02)<br>2442.240MHz (Channel 38)<br>2479.104MHz (Channel 74) |
| Frequency Channel | : | 37 channels |
| Antenna (Pencil Antenna ) | : | Hidaka Denki Work<br>Antenna Gain: 1.64dBi |
| Date of Receipt of Sample | : | Apr. 18, 2006 |
| Date of Test | : | Apr. 21 ~ 22, 2006 |

## 1.2. Tested Supporting System Details

### 1.2.1. PC SYSTEM

| | | |
|---|---|---|
| Model Number | : | D530 CMT |
| Serial Number | : | SGH34105H4 |
| FCC ID | : | By DoC |
| BSMI ID | : | R33001 |
| Brand | : | HP |
| Power Cord | : | Non-Shielded, Detachable, 1.8m |

### 1.2.2. 15" LCD MONITOR

| | | |
|---|---|---|
| Model Number | : | D5063M |
| Serial Number | : | CN206A6574 |
| FCC ID | : | ARSLM562H |
| BSMI ID | : | R33037 |
| Manufacturer | : | Top Victory Electronics (Fujian) Co., Ltd. |
| D-Sub Cable | : | Shielded, Detachable, 1.8m<br>Bonded two ferrite cores |
| AC Adapter | | Delta, M/N ADP-40TB<br>BSMI ID 3892D142<br>Cord: Shielded, Undetachable, 1.8m<br>Bonded a ferrite core |
| Power Cord | : | Non-Shielded, Detachable, 1.8m |

### 1.2.3. KEYBOARD

| | | |
|---|---|---|
| Model Number | : | SK-1688 |
| Serial Number | : | M0401000817 |
| FCC ID | : | GYUR84SK |
| BSMI ID | : | T3A002 |
| Manufacturer | : | Silitek (Brand: HP) |
| Data Cable | : | Non-Shielded, Undetachable, 1.8m |

### 1.2.4. MOUSE

| | | |
|---|---|---|
| Model Number | : | M-S69 |
| Serial Number | : | F6AB70S5BPMOGQ6 |
| FCC ID | : | JNZ211443 |
| BSMI ID | : | R41126 |
| Manufacturer | : | Logitech (Brand: HP) |
| Data Cable | : | Non-Shielded, Undetachable, 1.8m |

### 1.2.5. DC POWER SUPPLY (To Interface Board)

| | | |
|---|---|---|
| Model Number | : | 3303A |
| Serial Number | : | 721773 |
| Manufacturer | : | TOP WARD |
| DC Power Cable *2 | : | Non-Shielded, Detachable, 0.9m |
| AC Power Cord | : | Non-Shielded, Detachable, 1.8m |

1.2.6. CONVERSION BOARD (RS-232 Level Conversion Circuit)

| | | |
|---|---|---|
| Part Number | : | 050200008 |
| Serial Number | : | N/A |
| Manufacturer | : | FUTABA |
| RS-232 Cable | : | Shielded, Detachable, 1.5m (To PC System) |
| Data Cable | : | Non-Shielded, Detachable, 0.4m (To EUT) |
| Power Cable*2 | : | Non-Shielded, Detachable, 1m (To DC Power Supply) |

## 1.3. Description of Test Facility

Name of Firm : **Audix Corporation**
**Technical Division EMC Department**
No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
Taipei County 24443, Taiwan, R.O.C.

Test Location & Facility (AC) : **Semi-Anechoic Chamber**
No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
Taipei County 24443, Taiwan, R.O.C.

May. 16, 2003 File on
Federal Communication Commission
Registration Number: 90993

NVLAP Lab. Code : 200077-0
(NVLAP is a NATA accredited body under Mutual Recognition Agreement)

## 1.4. Measurement Uncertainty

| Test Item | Frequency Range | Uncertainty (dB), (V/m) |
|---|---|---|
| Radiation Test (Distance: 3m) | 30MHz~300MHz | ± 2.91dB |
| | 300MHz~1000MHz | ± 2.74dB |
| | Above 1GHz | ± 5.02dB |

Remark：Uncertainty = $ku_c(y)$

| Test Item | Uncertainty |
|---|---|
| 6dB Bandwidth | ± 0.05kHz |
| Emission Limitations | ± 0.13dB |
| Maximum peak output power | ± 0.33dBm |
| Band edges | ± 0.13dB |
| Power spectral density | ± 0.13dB |
| Occupied Bandwidth 99% Power | ± 0.05kHz |

# 2. CONDUCTED EMISSION MEASUREMET

【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC Part 15 Section §15.207】

# 3. RADIATED EMISSION MEASUREMENT

## 3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

### 3.1.1. For Frequency Range 30MHz~1000MHz (at Semi-Anechoic Chamber)

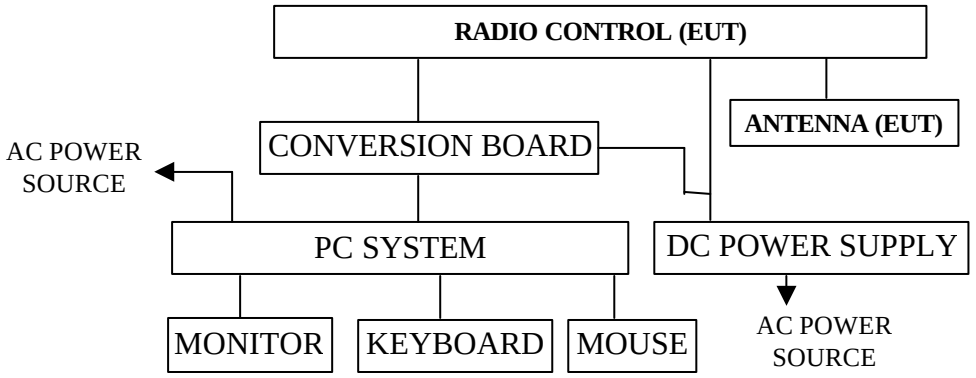
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8593EM | 3826A00248 | Sep. 26, 05' | Sep. 25, 06' |
| 2. | Test Receiver | R & S | ESCS30 | 100265 | Sep. 27, 05' | Sep. 25, 06' |
| 3. | Pre-Amplifier | HP | 8447D | 2944A06305 | Mar. 09, 06' | Mar. 08, 07' |
| 4. | Biconical Antenna | CHASE | VBA6106A | 1264 | Nov. 11, 05' | Nov. 10, 06' |
| 5. | Log Periodic Antenna | Schwarzbeck | UHALP9108-A | 0139 | Nov. 19, 05' | Nov. 18, 06' |

### 3.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

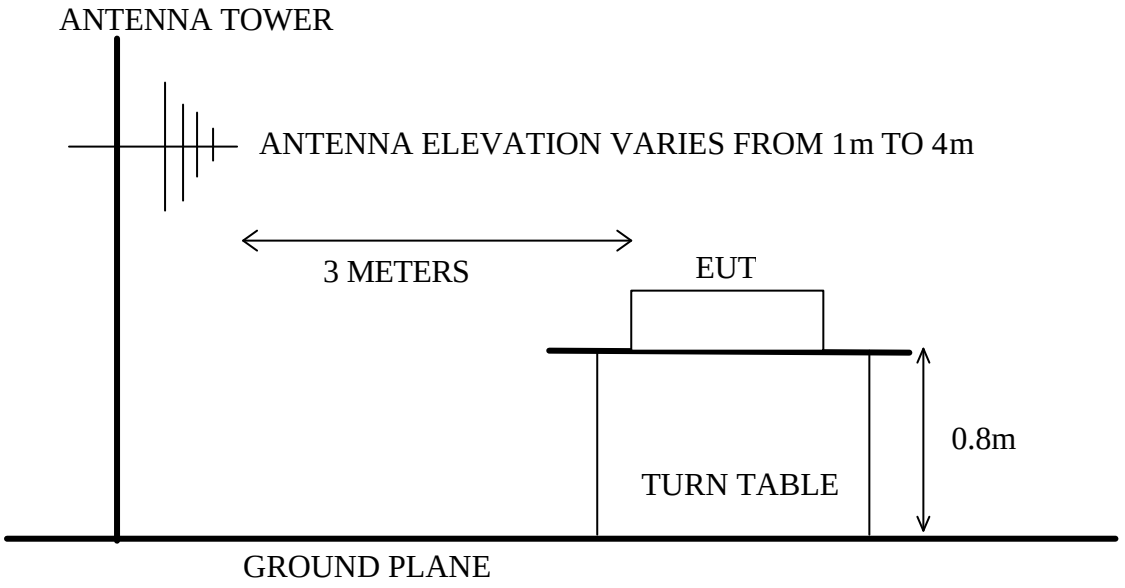
| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8593EM | 3826A00248 | Sep. 26, 05' | Sep. 25, 06' |
| 2. | Pre-Amplifier | HP | 8449B | 3008A01284 | Jul. 05, 05' | Jul. 04, 06' |
| 3. | 3.5G High Pass Filter | HP | 84300-80038 | 005 | Jan. 11, 06' | Jan. 10, 07' |
| 4. | Horn Antenna | EMCO | 3115 | 9112-3775 | May 04, 05' | May 03, 06' |

## 3.2. Test Setup

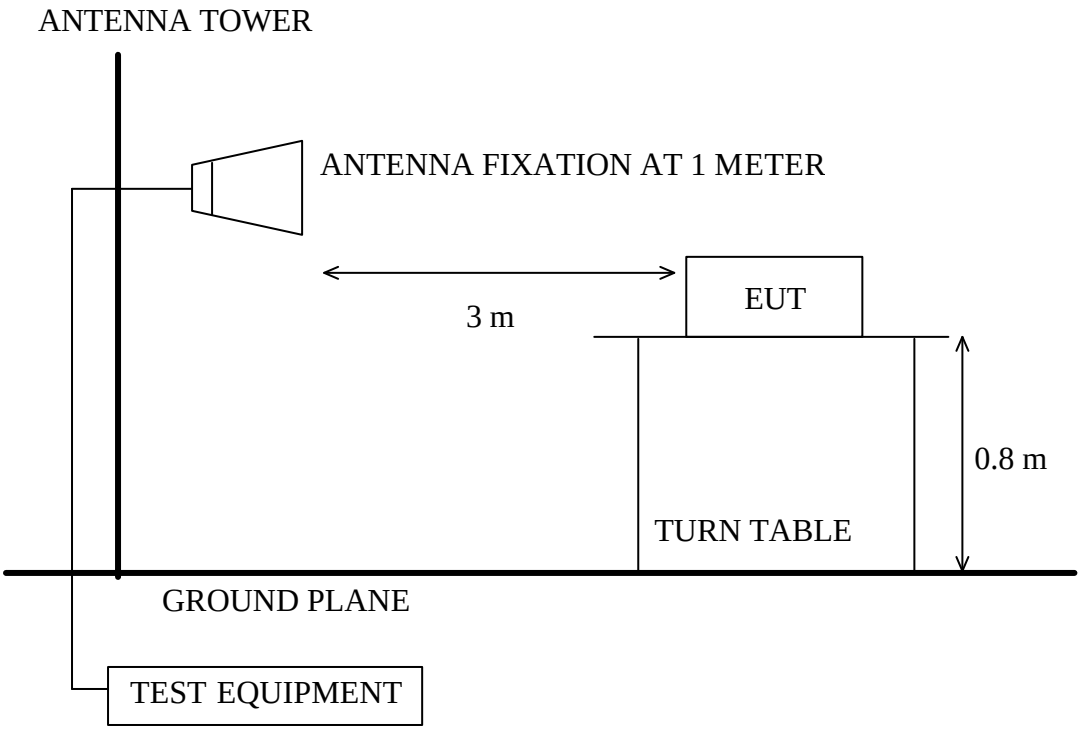
### 3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz




3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



## 3.3. Radiated Emission Limits (§15.209)

| FREQUENCY MHz | DISTANCE Meters | FIELD STRENGTHS LIMITS | |
|---|---|---|---|
| | | μV/m | dBμV/m |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| Above 960 | 3 | 500 | 54.0 |
| Above 1000 | 3 | 74.0 dBμV/m (Peak)<br>54.0 dBμV/m (Average) | |

Remark：(1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
(5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

## 3.4. Operating Condition of EUT

3.4.1. Setup the EUT and simulator as shown on 3.2.

3.4.2. Turned on the power of all equipment.

3.4.3. The EUT was set the PC system using test program "FutabaTerm".

3.4.4. The EUT was set to continuously transmit signals at 2405.376MHz (stand), 2442.240MHz (stand, side and Lie) and 2479.104MHz (stand) during testing.

## 3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver ESCS30 was set at 120kHz.

The bandwidth of the Spectrum Analyzer was set at 1MHz.

The frequency range from 30MHz to 25GHz (Up to $10^{th}$ harmonics from fundamental frequency) was checked.

## 3.6. Test Results

**PASSED.**
(All emissions not reported below are too low against the prescribed limits.)

EUT：Radio Control M/N：PK-FSM-2.4G

Test Date：Apr. 22, 2006 Temperature：26℃ Humidity：62%

**For Frequency Range 30MHz~1000MHz:**

The EUT with following test modes were performed during this section testing and all the test results are listed in section 3.6.1.

| Mode | Channel | Frequency | Position | Reference Test Data # | |
|---|---|---|---|---|---|
| | | | | Horizontal | Vertical |
| 1. | 02 | 2405.376MHz | Stand | # 9 | # 10 |
| 2. | 38 | 2442.240MHz | Stand | # 10 | # 9 |
| 3. | | | Side | # 9 | # 10 |
| 4. | | | Lie | # 10 | # 9 |
| 5. | 74 | 2479.104MHz | Stand | # 9 | # 10 |

* Above all final readings were measured with Quasi-Peak detector.

**For Frequency above 1GHz:**

The EUT with following test modes were performed during this section testing and all the test results are listed in section 3.6.2.

| Mode | Channel | Frequency | Position |
|---|---|---|---|
| 1. | 02 | 2405.376MHz | Stand |
| 2. | 38 | 2442.240MHz | Stand |
| 3. | | | Side |
| 4. | | | Lie |
| 5. | 74 | 2479.104MHz | Stand |

* Above all final readings were measured with Peak detector and Average detector.

**For Restricted Bands:**

The EUT was tested in restricted bands and all the test results are listed in section 3.6.3. (The restricted bands defined in part 15.205(a))

| Mode | Channel | Frequency |
|---|---|---|
| 1. | 02 | 2405.376MHz |
| 2. | 74 | 2479.104MHz |

### 3.6.1. Frequency Range 30-1000MHz

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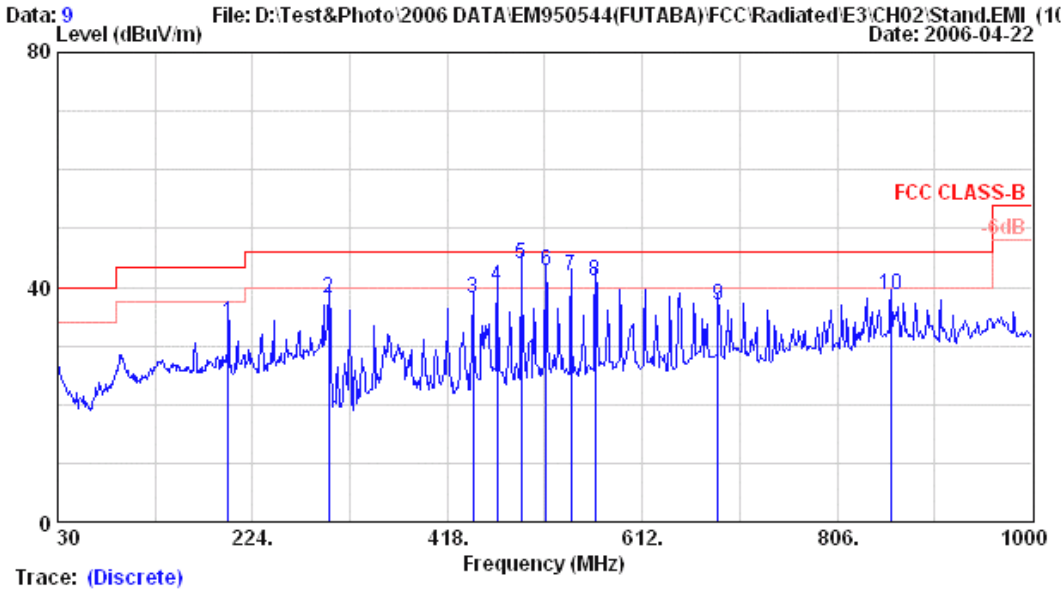


```
Site no.      : A/C Chamber                    Data no.   : 9
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A      Ant. pol.  : HORIZONTAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%               Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Stand----CH02
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.09 | 3.00 | 9.00 | 34.09 | 43.50 | 9.41 | QP |
| 2 | 299.660 | 26.77 | 3.90 | 7.43 | 38.10 | 46.00 | 7.90 | QP |
| 3 | 443.220 | 17.62 | 5.33 | 15.29 | 38.24 | 46.00 | 7.76 | QP |
| 4 | 467.470 | 18.21 | 5.80 | 16.25 | 40.26 | 46.00 | 5.74 | QP |
| 5 | 491.720 | 18.61 | 6.33 | 18.88 | 43.82 | 46.00 | 2.18 | QP |
| 6 | 515.970 | 19.98 | 6.80 | 16.11 | 42.89 | 46.00 | 3.11 | QP |
| 7 | 541.190 | 19.25 | 7.01 | 15.78 | 42.04 | 46.00 | 3.96 | QP |
| 8 | 565.440 | 20.49 | 6.60 | 13.93 | 41.02 | 46.00 | 4.98 | QP |
| 9 | 687.660 | 23.26 | 6.50 | 7.08 | 36.84 | 46.00 | 9.16 | QP |
| 10 | 859.350 | 26.01 | 7.20 | 5.50 | 38.70 | 46.00 | 7.30 | QP |

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

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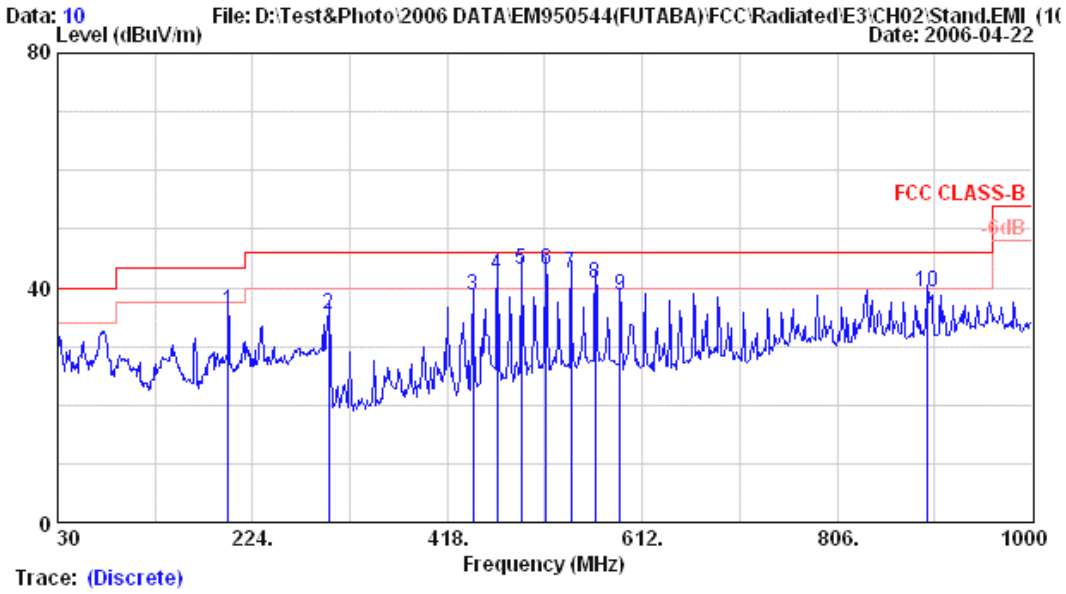


```
Site no.      : A/C Chamber                    Data no.   : 10
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A      Ant. pol.  : VERTICAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%               Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Stand----CH02
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.86 | 3.00 | 10.13 | 35.99 | 43.50 | 7.51 | QP |
| 2 | 299.660 | 26.86 | 3.90 | 4.68 | 35.44 | 46.00 | 10.56 | QP |
| 3 | 443.220 | 17.42 | 5.33 | 15.97 | 38.73 | 46.00 | 7.27 | QP |
| 4 | 467.470 | 18.99 | 5.80 | 17.44 | 42.24 | 46.00 | 3.76 | QP |
| 5 | 491.720 | 18.72 | 6.33 | 17.95 | 43.00 | 46.00 | 3.00 | QP |
| 6 | 515.970 | 20.86 | 6.80 | 15.47 | 43.12 | 46.00 | 2.88 | QP |
| 7 | 541.190 | 20.48 | 7.01 | 15.07 | 42.56 | 46.00 | 3.44 | QP |
| 8 | 565.440 | 22.08 | 6.60 | 12.02 | 40.70 | 46.00 | 5.30 | QP |
| 9 | 589.690 | 21.49 | 6.30 | 11.02 | 38.81 | 46.00 | 7.19 | QP |
| 10 | 896.210 | 25.88 | 7.30 | 6.20 | 39.39 | 46.00 | 6.61 | QP |

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

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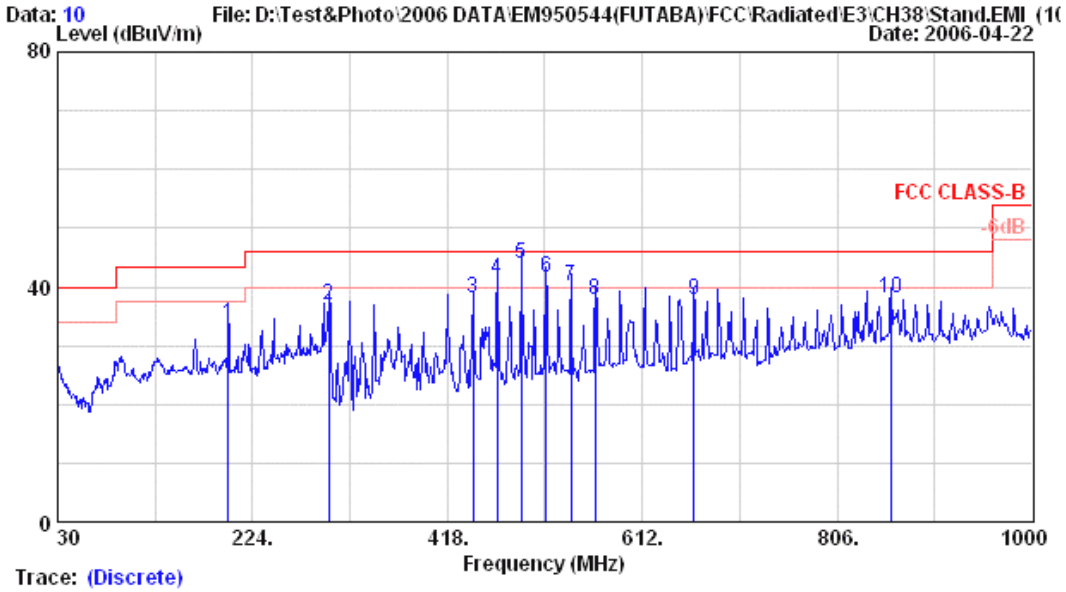


Site no. : A/C Chamber Data no. : 10
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : HORIZONTAL
Limit : FCC CLASS-B
Env. / Ins. : 8593EM 26*C/62% Engineer : Alvin_Yang
EUT : Radio Control M/N:PK-FSM-2.4G
Power Rating : DC9.6V
Test Mode : Stand----CH38

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.09 | 3.00 | 8.74 | 33.83 | 43.50 | 9.67 | QP |
| 2 | 299.660 | 26.77 | 3.90 | 6.14 | 36.81 | 46.00 | 9.19 | QP |
| 3 | 443.220 | 17.62 | 5.33 | 15.14 | 38.09 | 46.00 | 7.91 | QP |
| 4 | 467.470 | 18.21 | 5.80 | 17.30 | 41.31 | 46.00 | 4.69 | QP |
| 5 | 491.720 | 18.61 | 6.33 | 18.99 | 43.93 | 46.00 | 2.07 | QP |
| 6 | 515.970 | 19.98 | 6.80 | 14.70 | 41.48 | 46.00 | 4.52 | QP |
| 7 | 541.190 | 19.25 | 7.01 | 13.96 | 40.22 | 46.00 | 5.78 | QP |
| 8 | 565.440 | 20.49 | 6.60 | 10.82 | 37.91 | 46.00 | 8.09 | QP |
| 9 | 663.410 | 22.52 | 6.32 | 9.06 | 37.90 | 46.00 | 8.10 | QP |
| 10 | 859.350 | 26.01 | 7.20 | 4.78 | 37.98 | 46.00 | 8.02 | QP |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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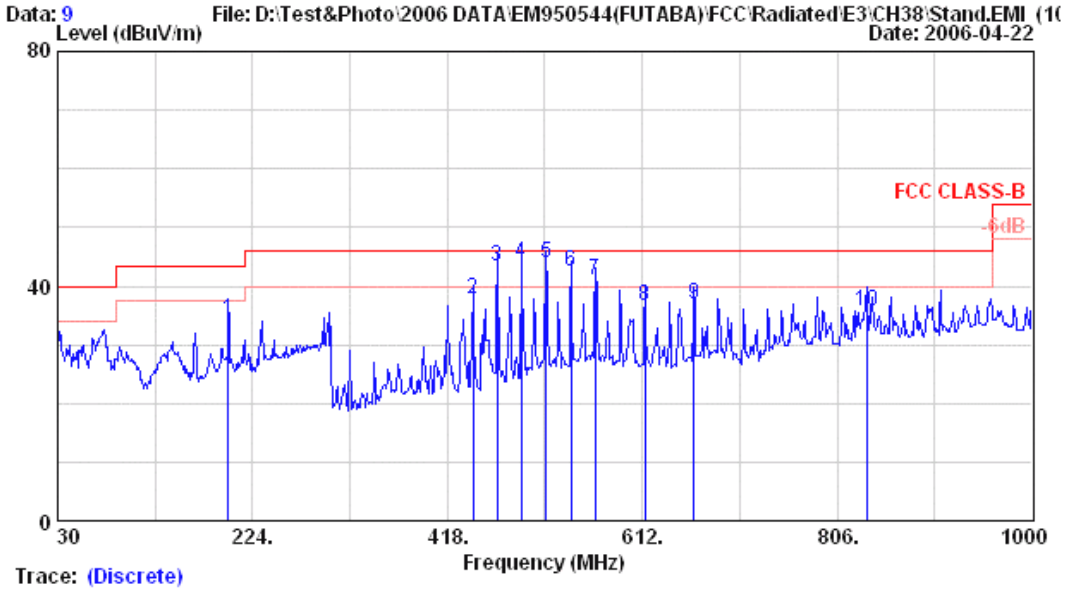


```
Site no.      : A/C Chamber                  Data no.   : 9
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A    Ant. pol.  : VERTICAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%             Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Stand----CH38
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.86 | 3.00 | 8.48 | 34.34 | 43.50 | 9.16 | QP |
| 2 | 443.220 | 17.42 | 5.33 | 14.97 | 37.73 | 46.00 | 8.27 | QP |
| 3 | 467.470 | 18.99 | 5.80 | 18.52 | 43.32 | 46.00 | 2.68 | QP |
| 4 | 491.720 | 18.72 | 6.33 | 18.88 | 43.93 | 46.00 | 2.07 | QP |
| 5 | 515.970 | 20.86 | 6.80 | 16.21 | 43.86 | 46.00 | 2.14 | QP |
| 6 | 541.190 | 20.48 | 7.01 | 14.88 | 42.37 | 46.00 | 3.63 | QP |
| 7 | 565.440 | 22.08 | 6.60 | 12.37 | 41.05 | 46.00 | 4.95 | QP |
| 8 | 614.910 | 21.35 | 6.30 | 9.11 | 36.76 | 46.00 | 9.24 | QP |
| 9 | 663.410 | 22.22 | 6.32 | 8.25 | 36.79 | 46.00 | 9.21 | QP |
| 10 | 835.100 | 26.32 | 7.10 | 2.30 | 35.72 | 46.00 | 10.28 | QP |

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

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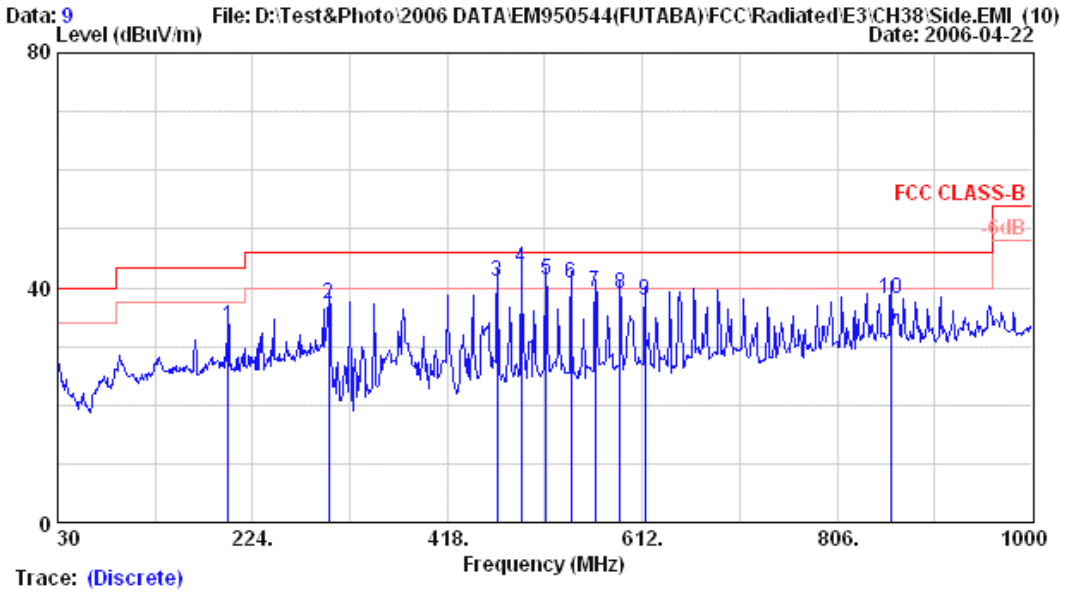


```
Site no.      : A/C Chamber                    Data no.   : 9
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A      Ant. pol.  : HORIZONTAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%               Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Side----CH38
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.09 | 3.00 | 8.44 | 33.53 | 43.50 | 9.97 | QP |
| 2 | 299.660 | 26.77 | 3.90 | 6.47 | 37.14 | 46.00 | 8.86 | QP |
| 3 | 467.470 | 18.21 | 5.80 | 17.04 | 41.05 | 46.00 | 4.95 | QP |
| 4 | 491.720 | 18.61 | 6.33 | 18.37 | 43.31 | 46.00 | 2.69 | QP |
| 5 | 515.970 | 19.98 | 6.80 | 14.56 | 41.34 | 46.00 | 4.66 | QP |
| 6 | 541.190 | 19.25 | 7.01 | 14.43 | 40.69 | 46.00 | 5.31 | QP |
| 7 | 565.440 | 20.49 | 6.60 | 12.18 | 39.27 | 46.00 | 6.73 | QP |
| 8 | 589.690 | 21.01 | 6.30 | 11.74 | 39.06 | 46.00 | 6.94 | QP |
| 9 | 614.910 | 21.33 | 6.30 | 10.27 | 37.90 | 46.00 | 8.10 | QP |
| 10 | 859.350 | 26.01 | 7.20 | 4.87 | 38.07 | 46.00 | 7.93 | QP |

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

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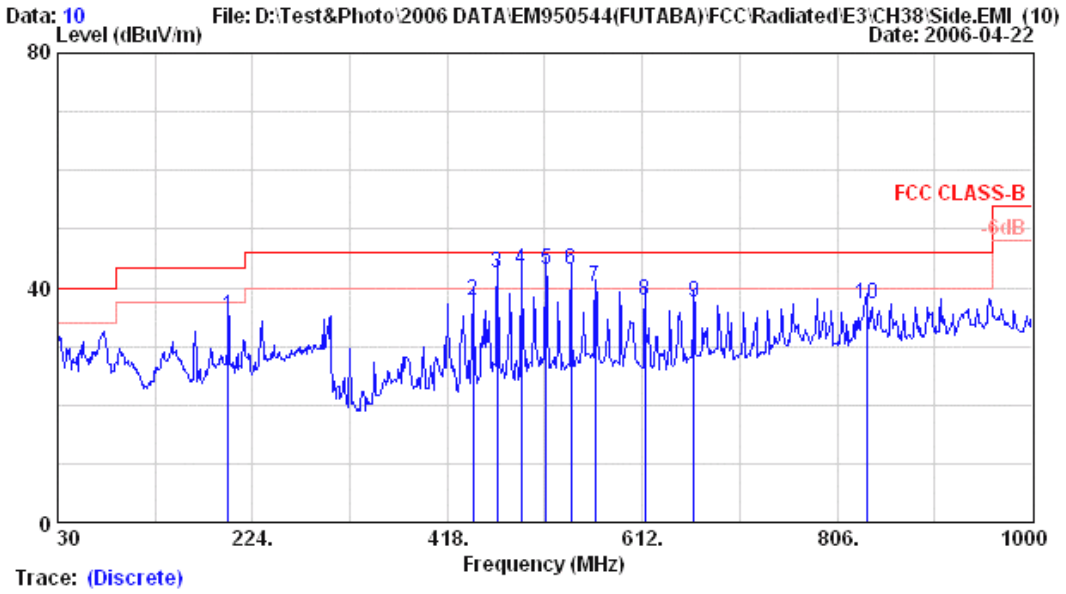


```
Site no.      : A/C Chamber                    Data no.   : 10
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A      Ant. pol.  : VERTICAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%               Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Side----CH38
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.86 | 3.00 | 9.18 | 35.04 | 43.50 | 8.46 | QP |
| 2 | 443.220 | 17.42 | 5.33 | 14.97 | 37.73 | 46.00 | 8.27 | QP |
| 3 | 467.470 | 18.99 | 5.80 | 17.66 | 42.46 | 46.00 | 3.54 | QP |
| 4 | 491.720 | 18.72 | 6.33 | 17.95 | 43.00 | 46.00 | 3.00 | QP |
| 5 | 515.970 | 20.86 | 6.80 | 15.53 | 43.18 | 46.00 | 2.82 | QP |
| 6 | 541.190 | 20.48 | 7.01 | 15.57 | 43.06 | 46.00 | 2.94 | QP |
| 7 | 565.440 | 22.08 | 6.60 | 11.54 | 40.22 | 46.00 | 5.78 | QP |
| 8 | 614.910 | 21.35 | 6.30 | 10.09 | 37.74 | 46.00 | 8.26 | QP |
| 9 | 663.410 | 22.22 | 6.32 | 8.99 | 37.53 | 46.00 | 8.47 | QP |
| 10 | 835.100 | 26.32 | 7.10 | 3.68 | 37.10 | 46.00 | 8.90 | QP |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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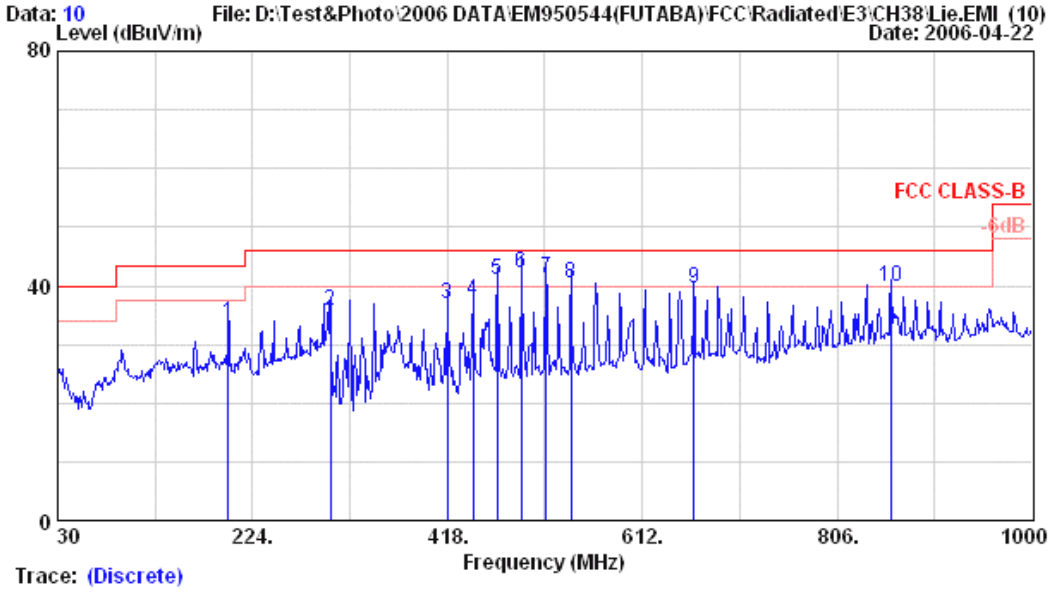


```
Site no.      : A/C Chamber                    Data no.   : 10
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A      Ant. pol.  : HORIZONTAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%               Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Lie----CH38
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.09 | 3.00 | 8.53 | 33.62 | 43.50 | 9.88 | QP |
| 2 | 301.600 | 14.59 | 3.90 | 17.13 | 35.62 | 46.00 | 10.38 | QP |
| 3 | 418.000 | 16.93 | 5.04 | 14.94 | 36.91 | 46.00 | 9.09 | QP |
| 4 | 443.220 | 17.62 | 5.33 | 14.43 | 37.38 | 46.00 | 8.62 | QP |
| 5 | 467.470 | 18.21 | 5.80 | 17.04 | 41.05 | 46.00 | 4.95 | QP |
| 6 | 491.720 | 18.61 | 6.33 | 17.13 | 42.07 | 46.00 | 3.93 | QP |
| 7 | 515.970 | 19.98 | 6.80 | 14.51 | 41.29 | 46.00 | 4.71 | QP |
| 8 | 541.190 | 19.25 | 7.01 | 14.13 | 40.39 | 46.00 | 5.61 | QP |
| 9 | 663.410 | 22.52 | 6.32 | 10.58 | 39.42 | 46.00 | 6.58 | QP |
| 10 | 859.350 | 26.01 | 7.20 | 6.77 | 39.97 | 46.00 | 6.03 | QP |

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

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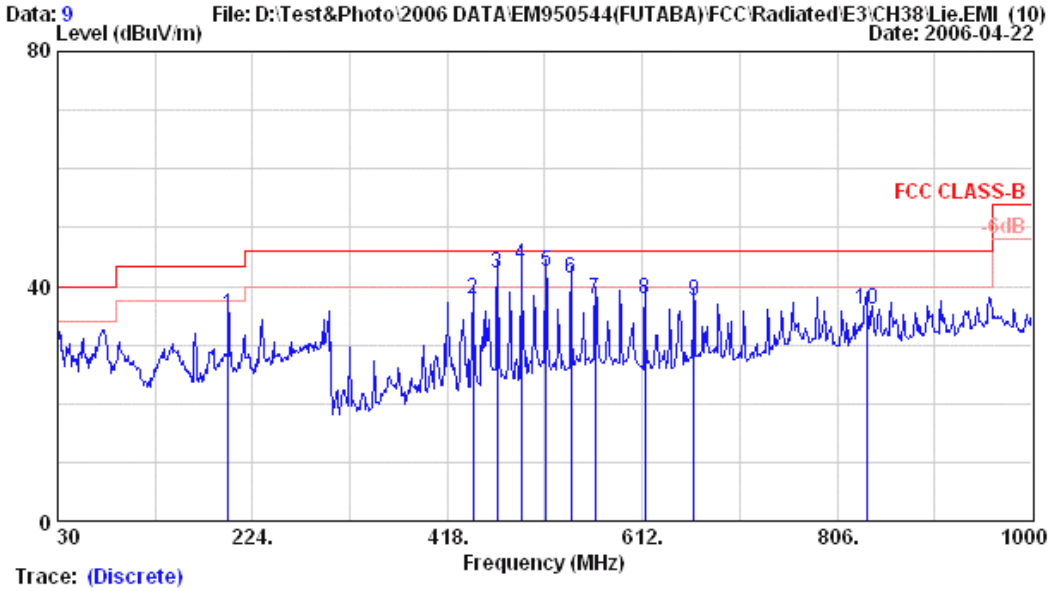


```
Site no.      : A/C Chamber                    Data no.   : 9
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A      Ant. pol.  : VERTICAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%               Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Lie----CH38
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.86 | 3.00 | 9.29 | 35.15 | 43.50 | 8.35 | QP |
| 2 | 443.220 | 17.42 | 5.33 | 14.97 | 37.73 | 46.00 | 8.27 | QP |
| 3 | 467.470 | 18.99 | 5.80 | 17.53 | 42.33 | 46.00 | 3.67 | QP |
| 4 | 491.720 | 18.72 | 6.33 | 18.69 | 43.74 | 46.00 | 2.26 | QP |
| 5 | 515.970 | 20.86 | 6.80 | 14.80 | 42.45 | 46.00 | 3.55 | QP |
| 6 | 541.190 | 20.48 | 7.01 | 13.74 | 41.23 | 46.00 | 4.77 | QP |
| 7 | 565.440 | 22.08 | 6.60 | 9.26 | 37.94 | 46.00 | 8.06 | QP |
| 8 | 614.910 | 21.35 | 6.30 | 10.09 | 37.74 | 46.00 | 8.26 | QP |
| 9 | 663.410 | 22.22 | 6.32 | 8.99 | 37.53 | 46.00 | 8.47 | QP |
| 10 | 835.100 | 26.32 | 7.10 | 2.68 | 36.10 | 46.00 | 9.90 | QP |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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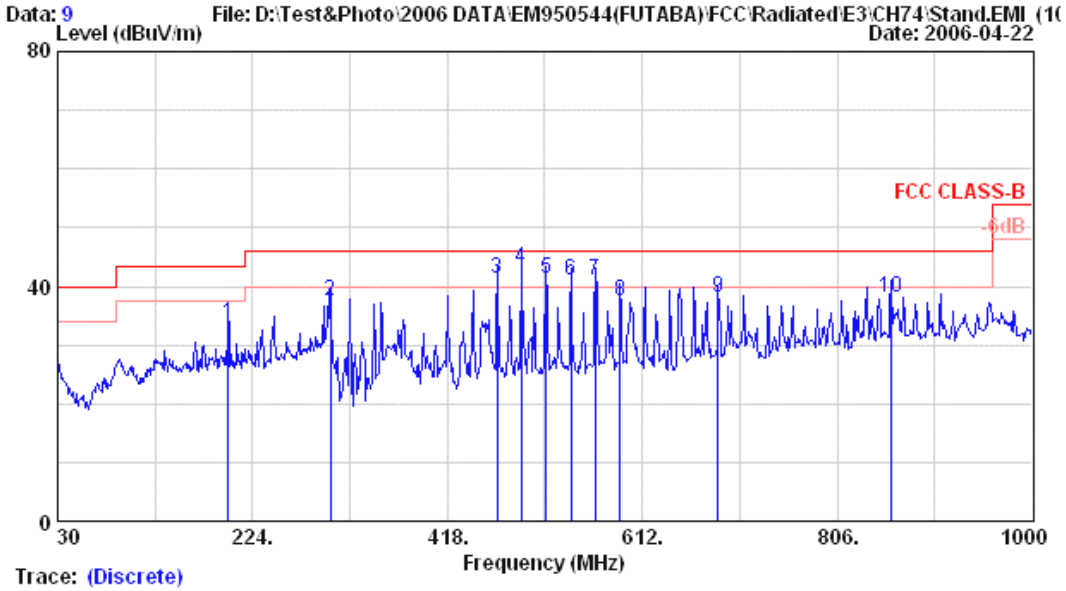


Site no. : A/C Chamber Data no. : 9
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : HORIZONTAL
Limit : FCC CLASS-B
Env. / Ins. : 8593EM 26*C/62% Engineer : Alvin_Yang
EUT : Radio Control M/N:PK-FSM-2.4G
Power Rating : DC9.6V
Test Mode : Stand----CH74

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.09 | 3.00 | 8.74 | 33.83 | 43.50 | 9.67 | QP |
| 2 | 301.600 | 14.59 | 3.90 | 18.99 | 37.48 | 46.00 | 8.52 | QP |
| 3 | 467.470 | 18.21 | 5.80 | 17.30 | 41.31 | 46.00 | 4.69 | QP |
| 4 | 491.720 | 18.61 | 6.33 | 18.14 | 43.08 | 46.00 | 2.92 | QP |
| 5 | 515.970 | 19.98 | 6.80 | 14.67 | 41.45 | 46.00 | 4.55 | QP |
| 6 | 541.190 | 19.25 | 7.01 | 14.71 | 40.97 | 46.00 | 5.03 | QP |
| 7 | 565.440 | 20.49 | 6.60 | 14.02 | 41.11 | 46.00 | 4.89 | QP |
| 8 | 589.690 | 21.01 | 6.30 | 10.07 | 37.39 | 46.00 | 8.61 | QP |
| 9 | 687.660 | 23.26 | 6.50 | 8.24 | 38.00 | 46.00 | 8.00 | QP |
| 10 | 859.350 | 26.01 | 7.20 | 4.91 | 38.11 | 46.00 | 7.89 | QP |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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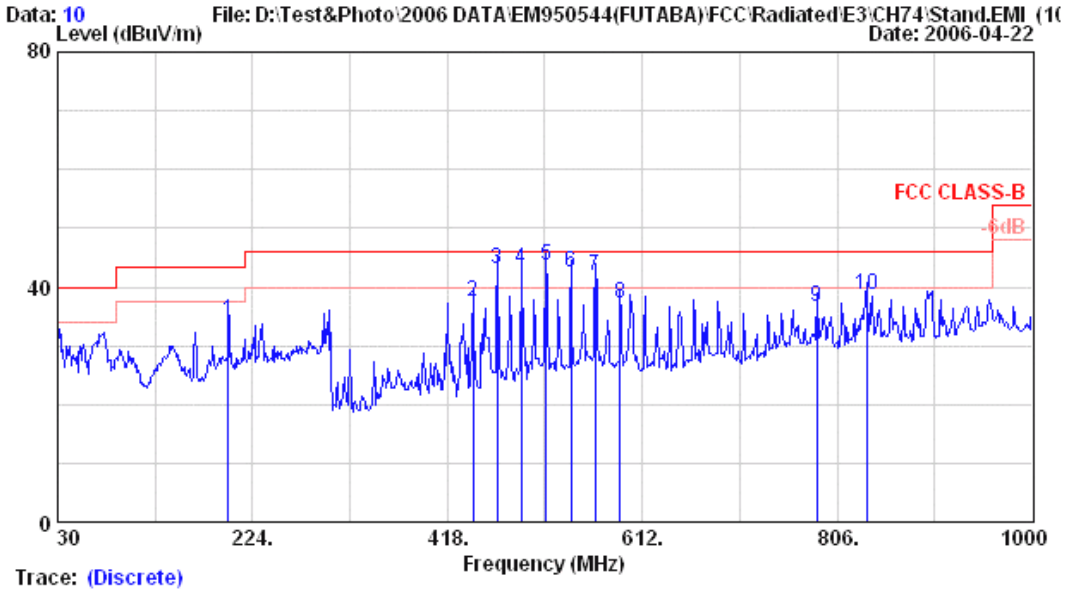



```
Site no.      : A/C Chamber                    Data no.   : 10
Dis. / Ant.   : 3m   VBA6106A/UHALP9108-A      Ant. pol.  : VERTICAL
Limit         : FCC CLASS-B
Env. / Ins.   : 8593EM  26*C/62%               Engineer   : Alvin_Yang
EUT           : Radio Control  M/N:PK-FSM-2.4G
Power Rating  : DC9.6V
Test Mode     : Stand----CH74
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBµV) | Emission Level (dBµV/m) | Limits (dBµV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 199.750 | 22.86 | 3.00 | 8.46 | 34.32 | 43.50 | 9.18 | QP |
| 2 | 443.220 | 17.42 | 5.33 | 14.74 | 37.50 | 46.00 | 8.50 | QP |
| 3 | 467.470 | 18.99 | 5.80 | 18.41 | 43.21 | 46.00 | 2.79 | QP |
| 4 | 491.720 | 18.72 | 6.33 | 18.00 | 43.05 | 46.00 | 2.95 | QP |
| 5 | 515.970 | 20.86 | 6.80 | 16.07 | 43.72 | 46.00 | 2.28 | QP |
| 6 | 541.190 | 20.48 | 7.01 | 14.95 | 42.44 | 46.00 | 3.56 | QP |
| 7 | 565.440 | 22.08 | 6.60 | 13.14 | 41.82 | 46.00 | 4.18 | QP |
| 8 | 589.690 | 21.49 | 6.30 | 9.49 | 37.28 | 46.00 | 8.72 | QP |
| 9 | 785.630 | 25.42 | 6.90 | 4.23 | 36.55 | 46.00 | 9.45 | QP |
| 10 | 835.100 | 26.32 | 7.10 | 5.28 | 38.70 | 46.00 | 7.30 | QP |

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```

3.6.2. Above 1GHz Frequency Range Measurement Results

Date of Test： Apr. 22, 2006 Temperature： 26℃

EUT： Radio Control Humidity： 62%

Test Mode： Channel: 02 (Frequency: 2405.376MHz), Position: Stand

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBμV | Emission Level Horizontal dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 15.37 | 44.79 | 74.00 | 29.21 |
| | 1199.682 | 25.29 | 4.59 | 14.38 | 44.26 | 74.00 | 29.74 |
| | 1607.436 | 25.98 | 6.18 | 16.21 | 48.37 | 74.00 | 25.63 |
| Average | 1011.746 | 25.21 | 4.21 | 8.37 | 37.79 | 54.00 | 16.21 |
| | 1199.682 | 25.29 | 4.59 | 6.38 | 36.26 | 54.00 | 17.74 |
| | 1607.436 | 25.98 | 6.18 | 8.21 | 40.37 | 54.00 | 13.63 |

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBμV | Emission Level Vertical dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 16.09 | 45.51 | 74.00 | 28.49 |
| | 1196.326 | 25.29 | 4.58 | 16.50 | 46.37 | 74.00 | 27.63 |
| | 1401.042 | 25.37 | 5.14 | 15.46 | 45.97 | 74.00 | 28.03 |
| | 1607.436 | 25.98 | 6.18 | 15.95 | 48.11 | 74.00 | 25.89 |
| Average | 1011.746 | 25.21 | 4.21 | 8.09 | 37.51 | 54.00 | 16.49 |
| | 1196.326 | 25.29 | 4.58 | 8.50 | 38.37 | 54.00 | 15.63 |
| | 1401.042 | 25.37 | 5.14 | 8.46 | 38.97 | 54.00 | 15.03 |
| | 1607.436 | 25.98 | 6.18 | 6.95 | 39.11 | 54.00 | 14.89 |

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test： Apr. 22, 2006 Temperature： 26℃

EUT： Radio Control Humidity： 62%

Test Mode： Channel: 38 (Frequency: 2442.240MHz), Position: Stand

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBμV | Emission Level Horizontal dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 14.66 | 44.08 | 74.00 | 29.92 |
| | 1199.682 | 25.29 | 4.59 | 14.76 | 44.64 | 74.00 | 29.36 |
| | 1594.012 | 25.90 | 6.12 | 14.41 | 46.43 | 74.00 | 27.57 |
| | 2072.242 | 27.96 | 5.95 | 13.27 | 47.18 | 74.00 | 26.82 |
| Average | 1011.746 | 25.21 | 4.21 | 6.66 | 36.08 | 54.00 | 17.92 |
| | 1199.682 | 25.29 | 4.59 | 7.76 | 37.64 | 54.00 | 16.36 |
| | 1594.012 | 25.90 | 6.12 | 6.41 | 38.43 | 54.00 | 15.57 |
| | 2072.242 | 27.96 | 5.95 | 5.27 | 39.18 | 54.00 | 14.82 |

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBμV | Emission Level Vertical dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 16.52 | 45.94 | 74.00 | 28.06 |
| | 1196.326 | 25.29 | 4.58 | 16.59 | 46.46 | 74.00 | 27.54 |
| | 1602.402 | 25.95 | 6.14 | 15.52 | 47.61 | 74.00 | 26.39 |
| | 2256.822 | 28.35 | 6.17 | 17.48 | 52.00 | 74.00 | 22.00 |
| Average | 1011.746 | 25.21 | 4.21 | 9.52 | 38.94 | 54.00 | 15.06 |
| | 1196.326 | 25.29 | 4.58 | 8.59 | 38.46 | 54.00 | 15.54 |
| | 1602.402 | 25.95 | 6.14 | 7.52 | 39.61 | 54.00 | 14.39 |
| | 2256.822 | 28.35 | 6.17 | 9.48 | 44.00 | 54.00 | 10.00 |

Remark： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test： Apr. 22, 2006 Temperature： 26℃

EUT： Radio Control Humidity： 62%

Test Mode： Channel: 38 (Frequency: 2442.240MHz), Position: Side

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBμV | Emission Level Horizontal dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 13.74 | 43.16 | 74.00 | 30.84 |
| | 1199.682 | 25.29 | 4.59 | 14.57 | 44.45 | 74.00 | 29.55 |
| | 1761.812 | 26.74 | 7.12 | 20.40 | 54.26 | 74.00 | 19.74 |
| | 2035.326 | 27.88 | 5.90 | 13.94 | 47.72 | 74.00 | 26.28 |
| Average | 1011.746 | 25.21 | 4.21 | 5.74 | 35.16 | 54.00 | 18.84 |
| | 1199.682 | 25.29 | 4.59 | 5.57 | 35.45 | 54.00 | 18.55 |
| | 1761.812 | 26.74 | 7.12 | 11.40 | 45.26 | 54.00 | 8.74 |
| | 2035.326 | 27.88 | 5.90 | 6.94 | 40.72 | 54.00 | 13.28 |

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBμV | Emission Level Vertical dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 14.94 | 44.36 | 74.00 | 29.64 |
| | 1199.682 | 25.29 | 4.59 | 16.22 | 46.10 | 74.00 | 27.90 |
| | 1599.046 | 25.93 | 6.14 | 14.99 | 47.06 | 74.00 | 26.94 |
| | 1745.032 | 26.67 | 7.12 | 17.77 | 51.56 | 74.00 | 22.44 |
| | 1761.812 | 26.74 | 7.12 | 21.03 | 54.89 | 74.00 | 19.11 |
| Average | 1011.746 | 25.21 | 4.21 | 6.94 | 36.36 | 54.00 | 17.64 |
| | 1199.682 | 25.29 | 4.59 | 8.22 | 38.10 | 54.00 | 15.90 |
| | 1599.046 | 25.93 | 6.14 | 5.99 | 38.06 | 54.00 | 15.94 |
| | 1745.032 | 26.67 | 7.12 | 8.77 | 42.56 | 54.00 | 11.44 |
| | 1761.812 | 26.74 | 7.12 | 12.03 | 45.89 | 54.00 | 8.11 |

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test： Apr. 22, 2006 Temperature： 26℃

EUT： Radio Control Humidity： 62%

Test Mode： Channel: 38 (Frequency: 2442.240MHz), Position: Lie

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBμV | Emission Level Horizontal dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 15.63 | 45.05 | 74.00 | 28.95 |
| | 1196.326 | 25.29 | 4.58 | 15.17 | 45.04 | 74.00 | 28.96 |
| | 1594.012 | 25.90 | 6.12 | 15.20 | 47.22 | 74.00 | 26.78 |
| | 1632.606 | 26.12 | 6.38 | 14.13 | 46.63 | 74.00 | 27.37 |
| Average | 1011.746 | 25.21 | 4.21 | 6.63 | 36.05 | 54.00 | 17.95 |
| | 1196.326 | 25.29 | 4.58 | 7.17 | 37.04 | 54.00 | 16.96 |
| | 1594.012 | 25.90 | 6.12 | 6.20 | 38.22 | 54.00 | 15.78 |
| | 1632.606 | 26.12 | 6.38 | 6.13 | 38.63 | 54.00 | 15.37 |

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBμV | Emission Level Vertical dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1011.746 | 25.21 | 4.21 | 16.23 | 45.65 | 74.00 | 28.35 |
| | 1199.682 | 25.29 | 4.59 | 16.36 | 46.24 | 74.00 | 27.76 |
| | 1397.686 | 25.37 | 5.14 | 16.27 | 46.78 | 74.00 | 27.22 |
| | 1602.402 | 25.95 | 6.14 | 16.32 | 48.41 | 74.00 | 25.59 |
| Average | 1011.746 | 25.21 | 4.21 | 8.23 | 37.65 | 54.00 | 16.35 |
| | 1199.682 | 25.29 | 4.59 | 7.36 | 37.24 | 54.00 | 16.76 |
| | 1397.686 | 25.37 | 5.14 | 9.27 | 39.78 | 54.00 | 14.22 |
| | 1602.402 | 25.95 | 6.14 | 7.32 | 39.41 | 54.00 | 14.59 |

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test： Apr. 22, 2006 Temperature： 26℃

EUT： Radio Control Humidity： 62%

Test Mode： Channel: 74 (Frequency: 2479.104MHz), Position: Stand

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBμV | Emission Level Horizontal dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1199.682 | 25.29 | 4.59 | 15.33 | 45.21 | 74.00 | 28.79 |
| | 1602.402 | 25.95 | 6.14 | 14.51 | 46.60 | 74.00 | 27.40 |
| | 1652.742 | 26.22 | 6.52 | 19.07 | 51.81 | 74.00 | 22.19 |
| Average | 1199.682 | 25.29 | 4.59 | 7.33 | 37.21 | 54.00 | 16.79 |
| | 1602.402 | 25.95 | 6.14 | 6.51 | 38.60 | 54.00 | 15.40 |
| | 1652.742 | 26.22 | 6.52 | 11.07 | 43.81 | 54.00 | 10.19 |

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBμV | Emission Level Vertical dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak | 1199.682 | 25.29 | 4.59 | 16.17 | 46.05 | 74.00 | 27.95 |
| | 1401.042 | 25.37 | 5.14 | 15.18 | 45.69 | 74.00 | 28.31 |
| | 1652.742 | 26.22 | 6.52 | 17.16 | 49.90 | 74.00 | 24.10 |
| | 2270.246 | 28.37 | 6.19 | 16.61 | 51.17 | 74.00 | 22.83 |
| | 2295.416 | 28.41 | 6.22 | 19.36 | 53.99 | 74.00 | 20.01 |
| Average | 1199.682 | 25.29 | 4.59 | 8.17 | 38.05 | 54.00 | 15.95 |
| | 1401.042 | 25.37 | 5.14 | 7.18 | 37.69 | 54.00 | 16.31 |
| | 1652.742 | 26.22 | 6.52 | 8.16 | 40.90 | 54.00 | 13.10 |
| | 2270.246 | 28.37 | 6.19 | 9.61 | 44.17 | 54.00 | 9.83 |
| | 2295.416 | 28.41 | 6.22 | 11.36 | 45.99 | 54.00 | 8.01 |

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

3.6.3. Restricted Bands Measurement Results

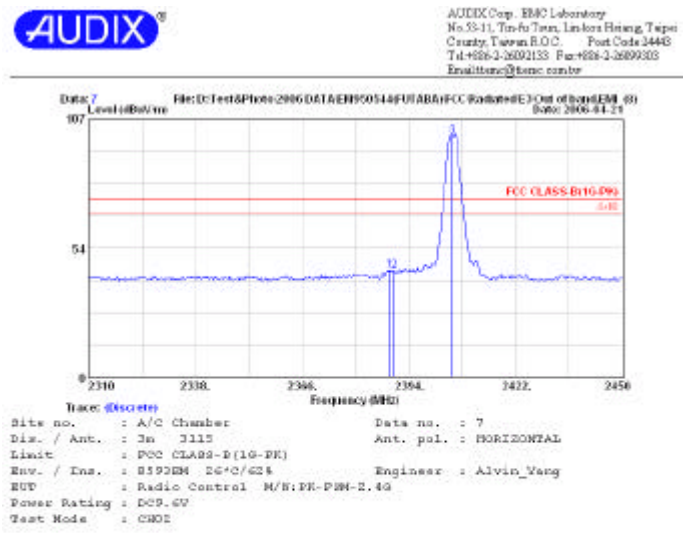
Date of Test： Apr. 21, 2006 Temperature： 26℃

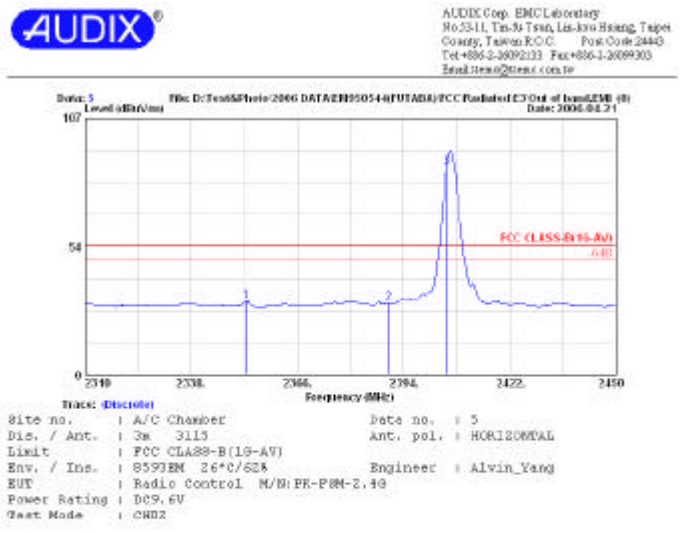
EUT： Radio Control Humidity： 62%

Test Mode： Channel: 02, Frequency: 2405.376MHz

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBμV | Emission Level Horizontal dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak * | 2388.960 | 28.59 | 6.34 | 9.52 | 44.45 | 74.00 | 29.55 |
| | 2390.000 | 28.59 | 6.34 | 9.13 | 44.06 | 74.00 | 29.94 |
| Average * | 2352.560 | 28.53 | 6.29 | -4.09 | 30.73 | 54.00 | 23.27 |
| | 2390.000 | 28.59 | 6.36 | -5.15 | 29.80 | 54.00 | 24.20 |

Remark： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 2310-2390MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.




| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2388.960 | 28.59 | 6.34 | 9.52 | 44.45 | 74.00 | 29.55 | Peak |
| 2 | 2390.000 | 28.59 | 6.34 | 9.13 | 44.07 | 74.00 | 29.93 | Peak |
| 3 | 2405.376 | 28.63 | 6.36 | 65.07 | 100.06 | 74.00 | -26.06 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2352.560 | 28.53 | 6.29 | -4.09 | 30.73 | 54.00 | 23.27 | Average |
| 2 | 2390.000 | 28.59 | 6.34 | -5.15 | 29.79 | 54.00 | 24.21 | Average |
| 3 | 2405.376 | 28.63 | 6.36 | 51.68 | 86.67 | 54.00 | -32.67 | Average |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

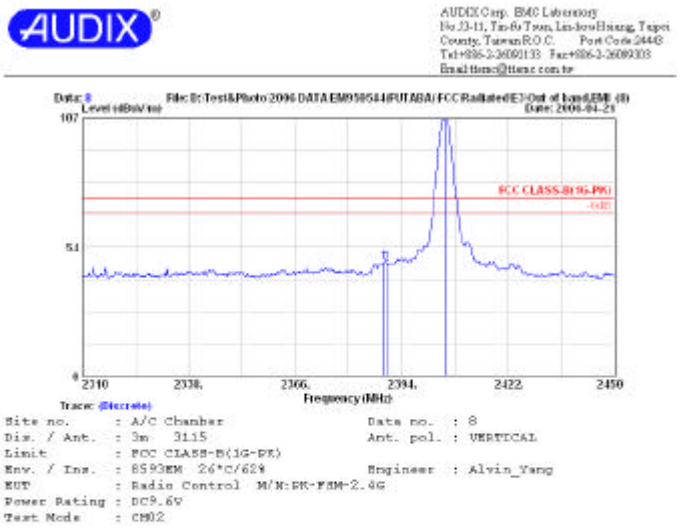
Date of Test： Apr. 21, 2006 Temperature： 26℃

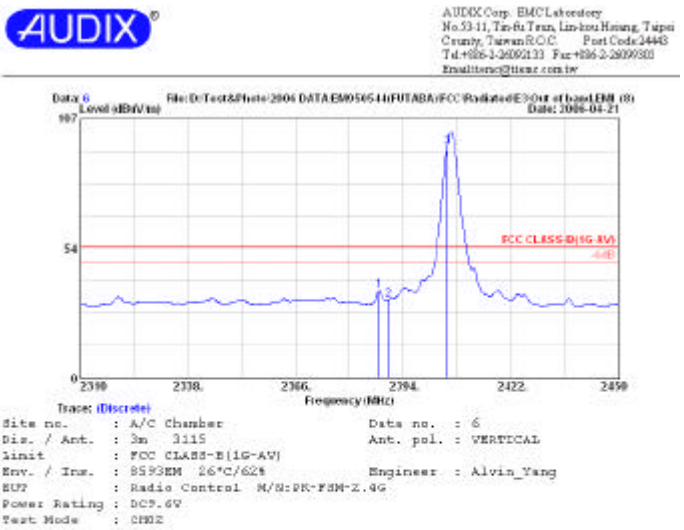
EUT： Radio Control Humidity： 62%

Test Mode： Channel: 02, Frequency: 2405.376MHz

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBμV | Emission Level Vertical dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak * | 2389.380 | 28.59 | 6.34 | 12.14 | 47.07 | 74.00 | 26.93 |
| | 2390.000 | 28.59 | 6.34 | 11.88 | 46.81 | 74.00 | 27.19 |
| Average * | 2387.560 | 28.59 | 6.34 | 1.10 | 36.03 | 54.00 | 17.97 |
| | 2390.000 | 28.59 | 6.34 | -2.78 | 32.15 | 54.00 | 21.85 |

Remark： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Low frequency section (spurious in the restricted band 2310-2390MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.




| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2389.380 | 28.59 | 6.34 | 12.14 | 47.08 | 74.00 | 26.92 | Peak |
| 2 | 2390.000 | 28.59 | 6.34 | 11.88 | 46.81 | 74.00 | 27.19 | Peak |
| 3 | 2405.376 | 28.63 | 6.36 | 71.16 | 106.15 | 74.00 | -32.15 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2387.560 | 28.59 | 6.34 | 1.10 | 36.03 | 54.00 | 17.97 | Average |
| 2 | 2390.000 | 28.59 | 6.34 | -2.78 | 32.15 | 54.00 | 21.85 | Average |
| 3 | 2405.376 | 28.63 | 6.36 | 60.81 | 95.80 | 54.00 | -41.80 | Average |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

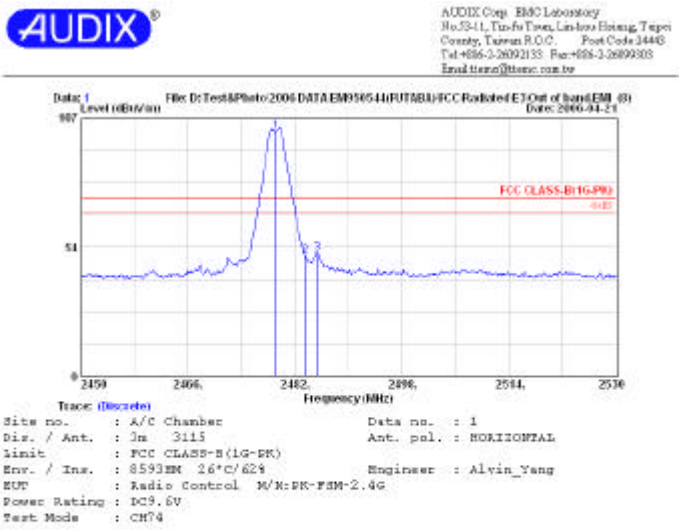
Date of Test： Apr. 21, 2006 Temperature： 26℃

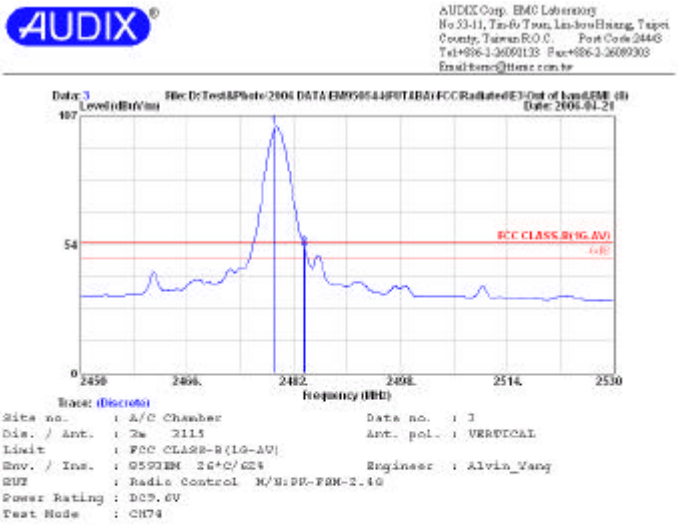
EUT： Radio Control Humidity： 62%

Test Mode： Channel: 74, Frequency: 2479.104MHz

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Horizontal dBμV | Emission Level Horizontal dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak * | 2483.500 | 28.77 | 6.45 | 14.65 | 49.87 | 74.00 | 24.13 |
| | 2485.360 | 28.77 | 6.45 | 15.79 | 51.01 | 74.00 | 22.99 |
| Average * | 2483.500 | 28.77 | 6.45 | 16.85 | 52.07 | 54.00 | 1.93 |
| | 2483.600 | 28.77 | 6.45 | 16.22 | 51.44 | 54.00 | 2.56 |

Remark： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. High frequency section (spurious in the restricted band 2483.5-2500MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.




| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2479.104 | 28.76 | 6.44 | 66.42 | 101.62 | 74.00 | -27.62 | Peak |
| 2 | 2483.500 | 28.77 | 6.45 | 14.65 | 49.87 | 74.00 | 24.13 | Peak |
| 3 | 2485.360 | 28.77 | 6.45 | 15.79 | 51.02 | 74.00 | 22.98 | Peak |

Remarks: 1. Emission level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2479.104 | 28.76 | 6.44 | 67.16 | 102.36 | 54.00 | -48.36 | Average |
| 2 | 2483.500 | 28.77 | 6.45 | 16.85 | 52.07 | 54.00 | 1.93 | Average |
| 3 | 2483.600 | 28.77 | 6.45 | 16.22 | 51.45 | 54.00 | 2.55 | Average |

Remarks: 1. Emission level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

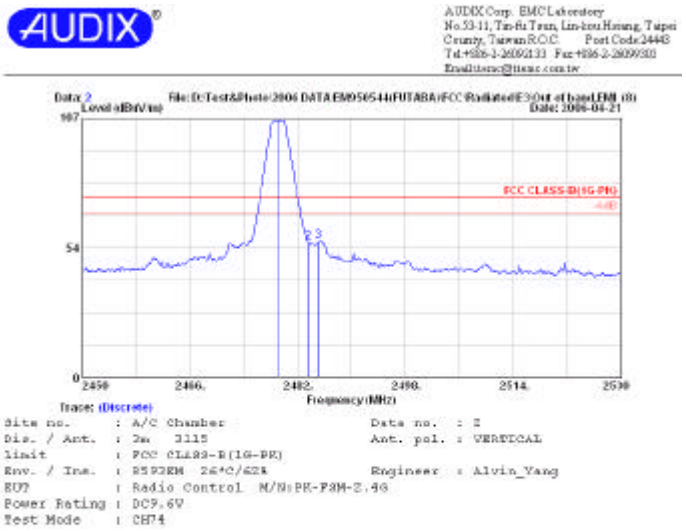
Date of Test： Apr. 21, 2006 Temperature： 26℃

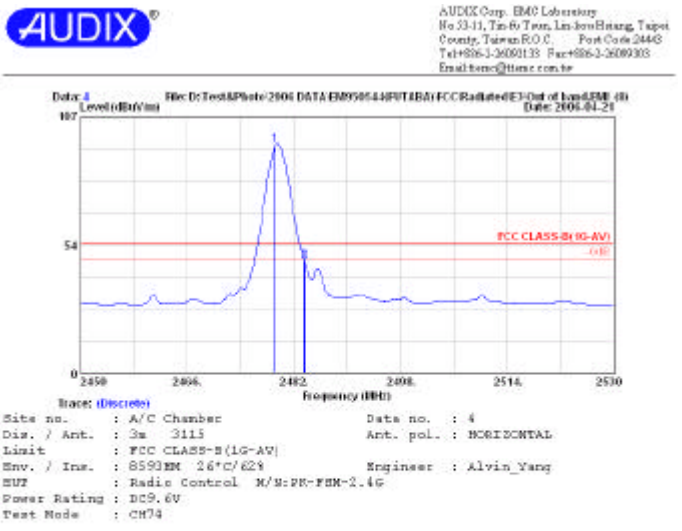
EUT： Radio Control Humidity： 62%

Test Mode： Channel: 74, Frequency: 2479.104MHz

| | Emission Frequency MHz | Antenna Factor dB/m | Cable Loss dB | Meter Reading Vertical dBμV | Emission Level Vertical dBμV/m | Limits dBμV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| Peak * | 2483.500 | 28.77 | 6.45 | 20.58 | 55.80 | 74.00 | 18.20 |
| | 2485.120 | 28.77 | 6.45 | 20.90 | 56.12 | 74.00 | 17.88 |
| Average * | 2483.500 | 28.77 | 6.45 | 11.62 | 46.84 | 54.00 | 7.16 |
| | 2483.600 | 28.77 | 6.45 | 11.06 | 46.28 | 54.00 | 7.72 |

Remark： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. High frequency section (spurious in the restricted band 2483.5-2500MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.




| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2479.104 | 28.76 | 6.44 | 70.49 | 105.69 | 74.00 | -31.69 | Peak |
| 2 | 2483.500 | 28.77 | 6.45 | 20.58 | 55.80 | 74.00 | 18.20 | Peak |
| 3 | 2485.120 | 28.77 | 6.45 | 20.90 | 56.13 | 74.00 | 17.87 | Peak |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBμV) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 2479.104 | 28.76 | 6.44 | 59.94 | 95.14 | 54.00 | -41.14 | Average |
| 2 | 2483.500 | 28.77 | 6.45 | 11.62 | 46.84 | 54.00 | 7.16 | Average |
| 3 | 2483.600 | 28.77 | 6.45 | 11.06 | 46.29 | 54.00 | 7.71 | Average |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

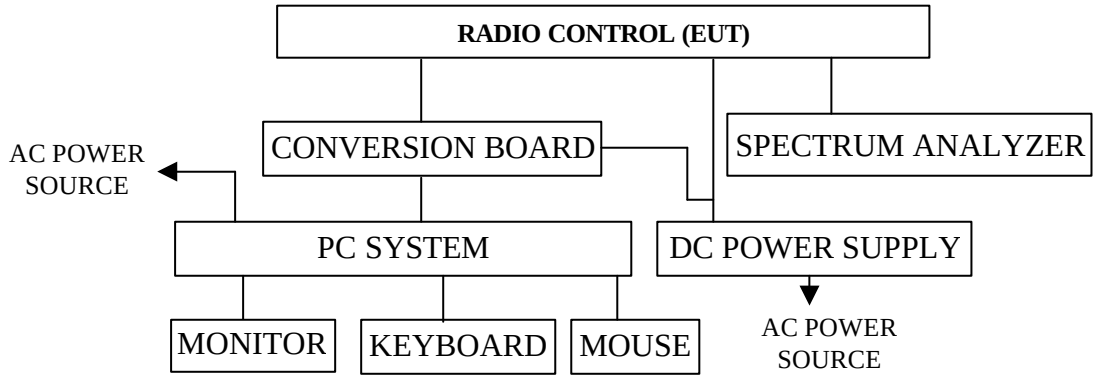
# 4. 6dB BANDWIDTH MEASUREMENT

## 4.1. Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8564EC | 3946A00249 | Nov. 20, 05' | Nov. 19, 06' |

## 4.2. Block Diagram of Test Setup




## 4.3. Specification Limits (§15.247(a)(2))

The minimum 6dB bandwidth shall be at least 500kHz.

## 4.4. Operating Condition of EUT

The test program "FutabaTerm" was used to enable the EUT to transmit data at different channel frequency individually.

## 4.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

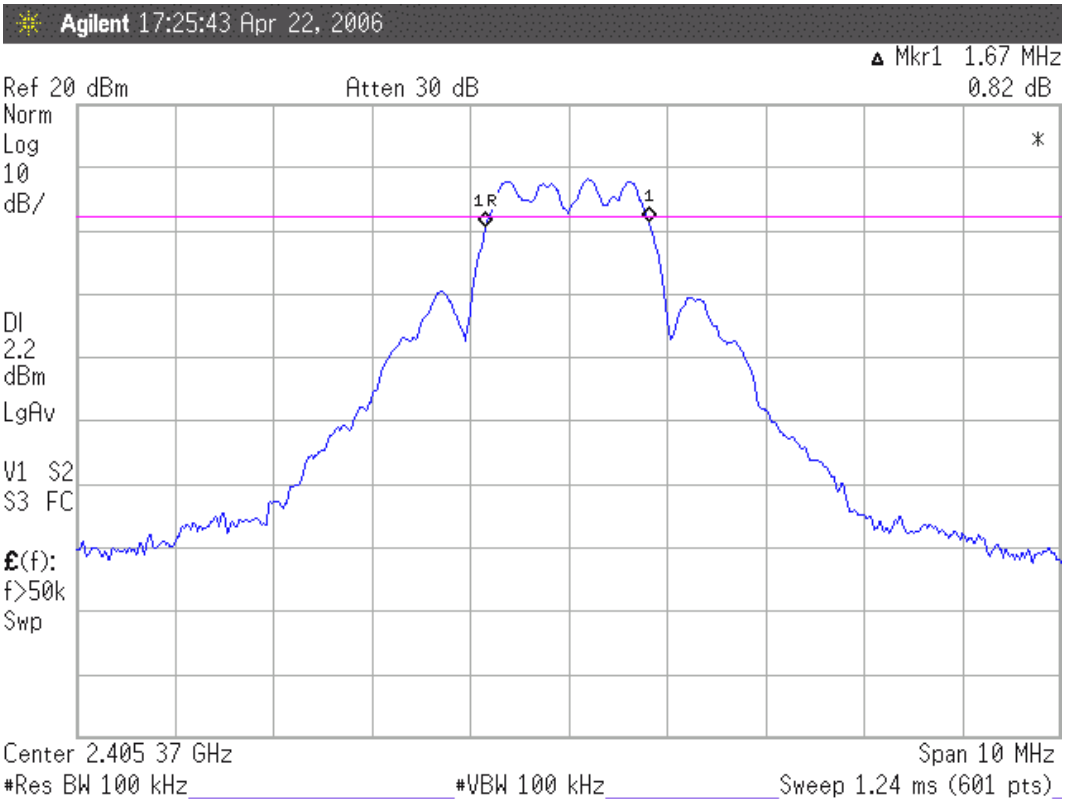
## 4.6. Test Results

**PASSED.** All the test results are attached in next pages.

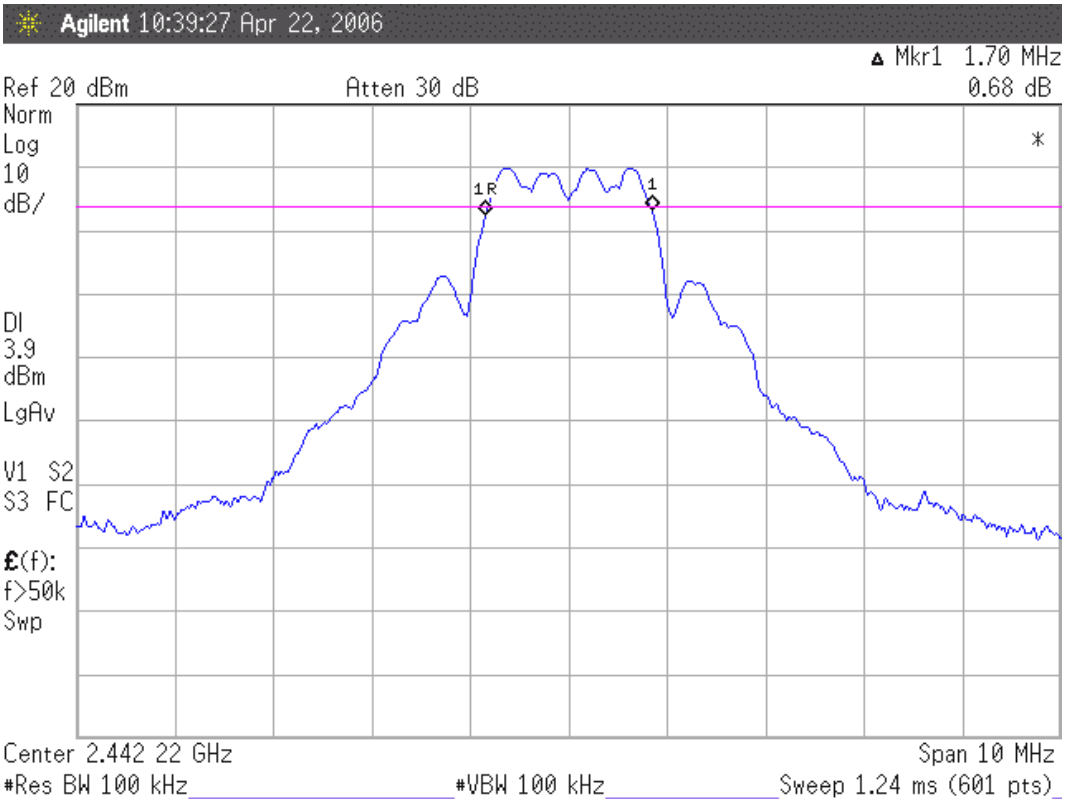
(Test Date : Apr. 22, 2006 Temperature : 26℃ Humidity : 62 %)

| Channel | Frequency | **6dB Bandwidth** |
|---|---|---|
| 0 | 2405.376MHz | **1.67MHz** |
| 38 | 2442.240MHz | **1.70MHz** |
| 74 | 2479.104MHz | **1.68MHz** |

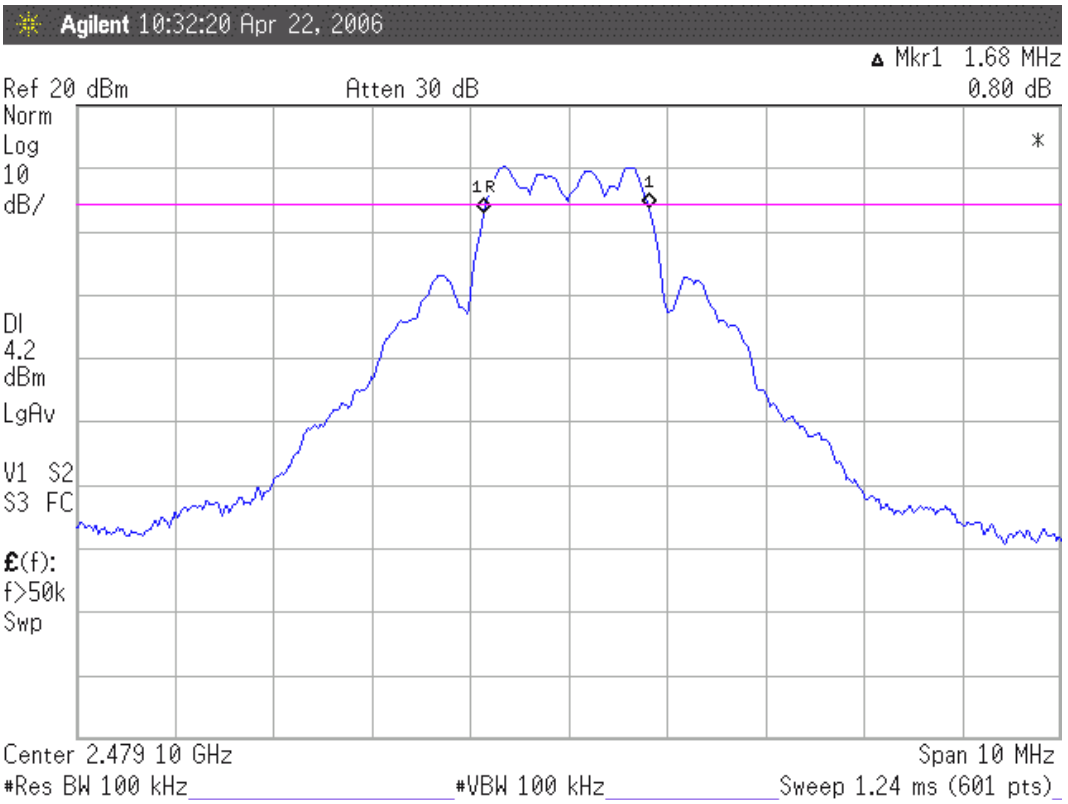
**Frequency: 2405.376MHz**




**Frequency: 2442.240MHz**



**Frequency: 2479.104MHz**



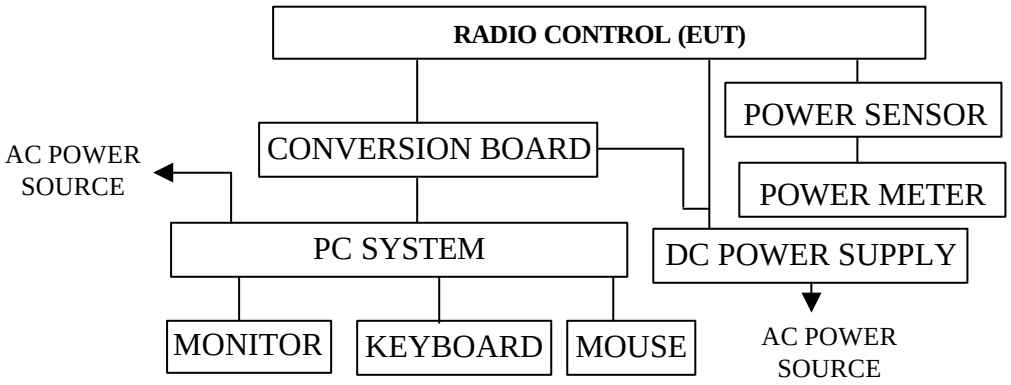
# 5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

## 5.1. Test Equipment

The following test equipment was used during the maximum peak output power measurement:

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Power Meter | Agilent | E4417A | GB41291797 | Feb. 27, 06' | Feb. 26, 07' |
| 2. | Power Sensor | Agilent | E9327A | US40441766 | Feb. 27, 06' | Feb. 26, 07' |

## 5.2. Block Diagram of Test Setup




## 5.3. Specification Limits (§15.247(b)-(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm)

## 5.4. Operating Condition of EUT

The test program "Futaba Term" was used to enable the EUT to transmit data at different channel frequency individually.

## 5.5. Test Procedure

The transmitter output was connected to the power meter that was designed to detect peak value automatically.

## 5.6. Test Results

**PASSED.** All the test results are listed below.

(Test Date : Apr. 22, 2006 Temperature : 26℃ Humidity : 62 %)

| Channel | Frequency | **Peak Output Power** | Limit |
|---|---|---|---|
| 02 | 2405.376MHz | **17.31dBm** | 30dBm |
| 38 | 2442.240MHz | **17.63dBm** | 30dBm |
| 74 | 2479.104MHz | **18.27dBm** | 30dBm |

# 6. EMISSION LIMITATIONS MEASUREMENT

## 6.1. Test Equipment

The following test equipment was used during the emission limitations test：

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8564EC | 3946A00249 | Nov. 20, 05' | Nov. 19, 06' |

## 6.2. Block Diagram of Test Setup

The same as section.4.2.

## 6.3. Specification Limits (§15.247(c))

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).(※ This test result attaching to §3.6.3)

## 6.4. Operating Condition of EUT

The test program "Futaba Term" was used to enable the EUT to transmit data at different channel frequency individually.

## 6.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW.

## 6.6. Test Results

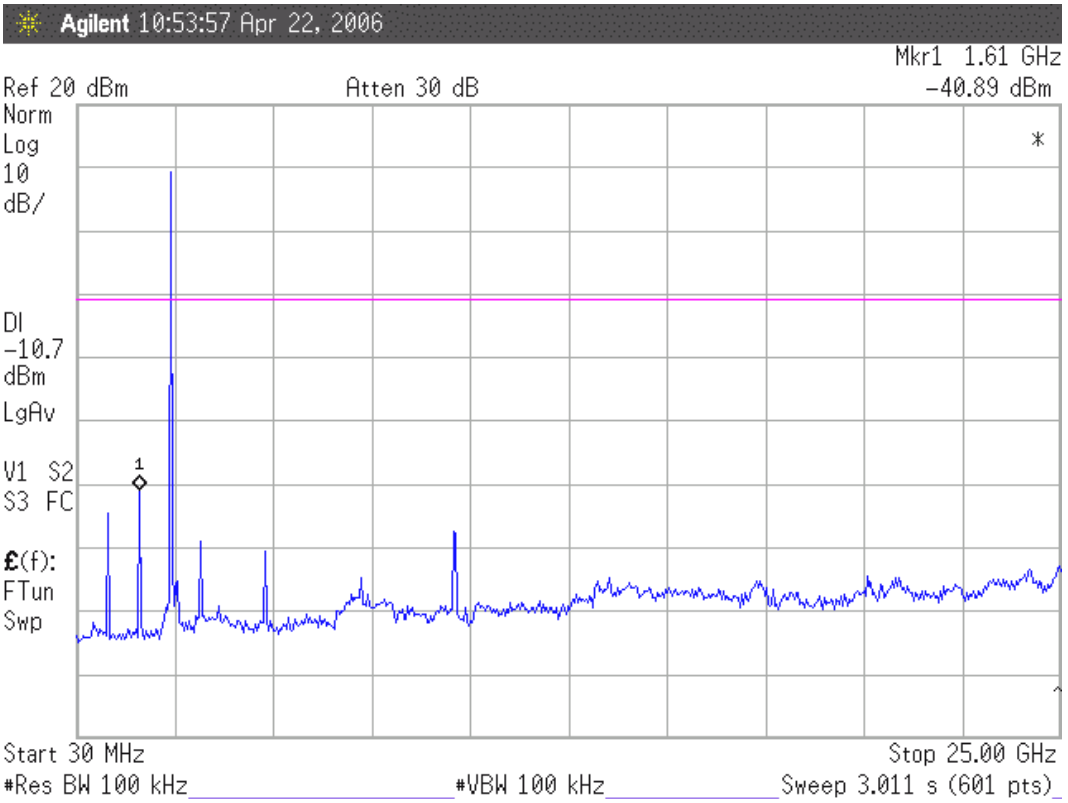
**PASSED.** The testing data was attached in the next pages.

(Test Date : Apr. 22, 2006 Temperature : 26℃ Humidity : 62 %)

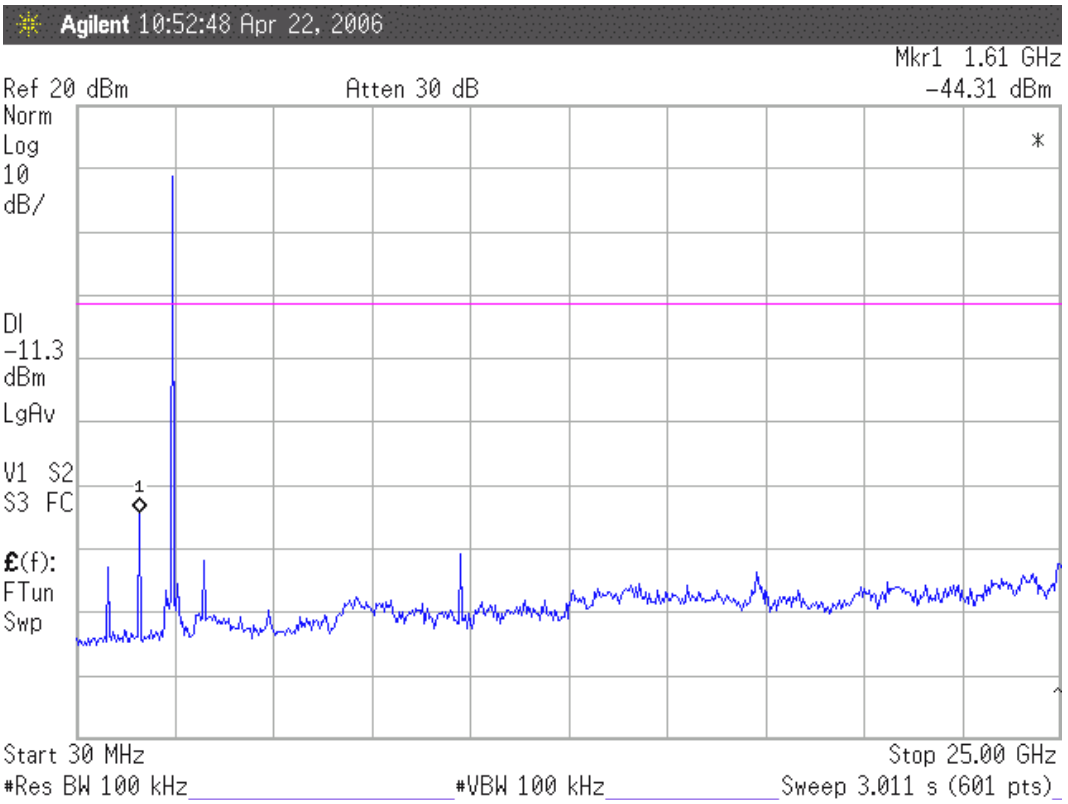
1. 2405.376MHz: During 30MHz~25GHz bandwidth. In the 1.61GHz, the –40.89dBm is max value that is lower than 20dB of primary channel.
2. 2442.240MHz: During 30MHz~25GHz bandwidth. In the 1.61GHz, the –44.31dBm is max value that is lower than 20dB of primary channel.
3. 2479.104MHz: During 30MHz~25GHz bandwidth. In the 1.65GHz, the –38.63dBm is max value that is lower than 20dB of primary channel.

Note: The peak above the limit line is the carrier frequency.

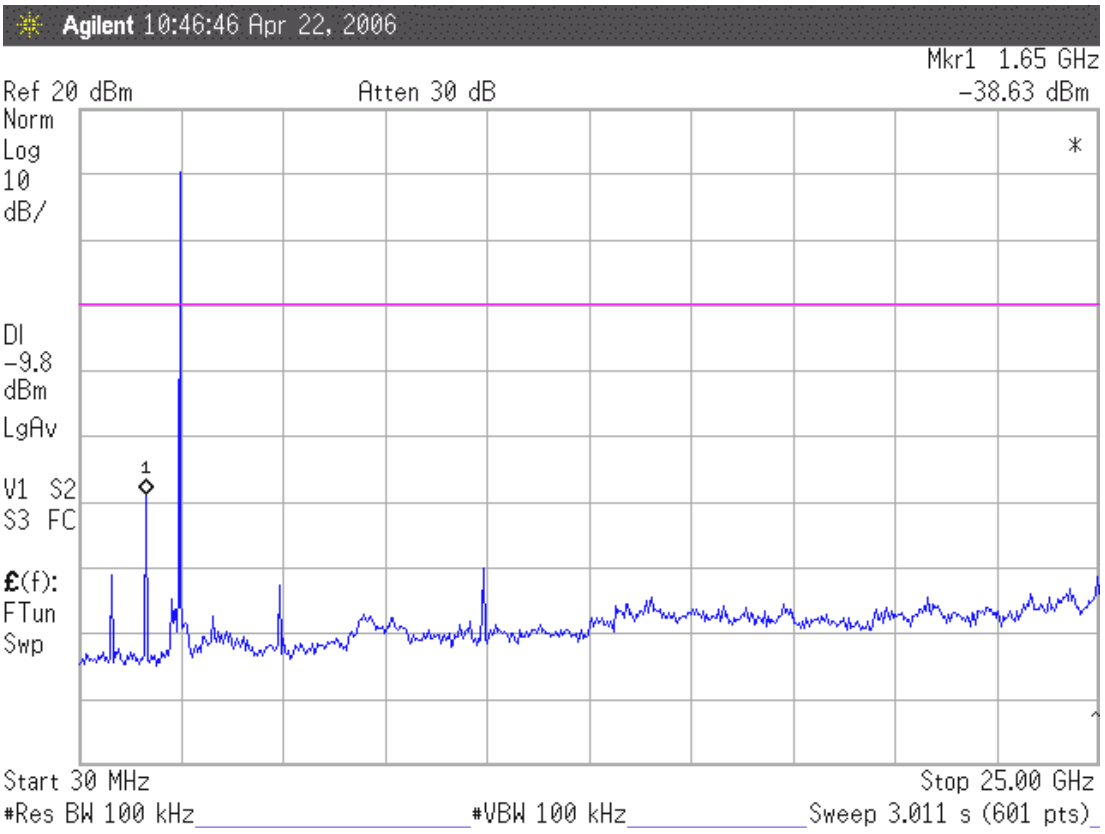
**Frequency: 2405.376MHz**




**Frequency: 2442.240MHz**



**Frequency: 2479.104MHz**



# 7. BAND EDGES MEASUREMENT

## 7.1. Test Equipment

The following test equipment was used during the band edges measurement:

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8564EC | 3946A00249 | Nov. 20, 05' | Nov. 19, 06' |

## 7.2. Block Diagram of Test Setup

The same as section.4.2.

## 7.3. Specification Limits (§15.247(c))

The highest level should be at least 20 dB below that in the 100kHz bandwidth.

## 7.4. Operating Condition of EUT

The test program "Futaba Term" was used to enable the EUT to transmit data at different channel frequency individually.

## 7.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.

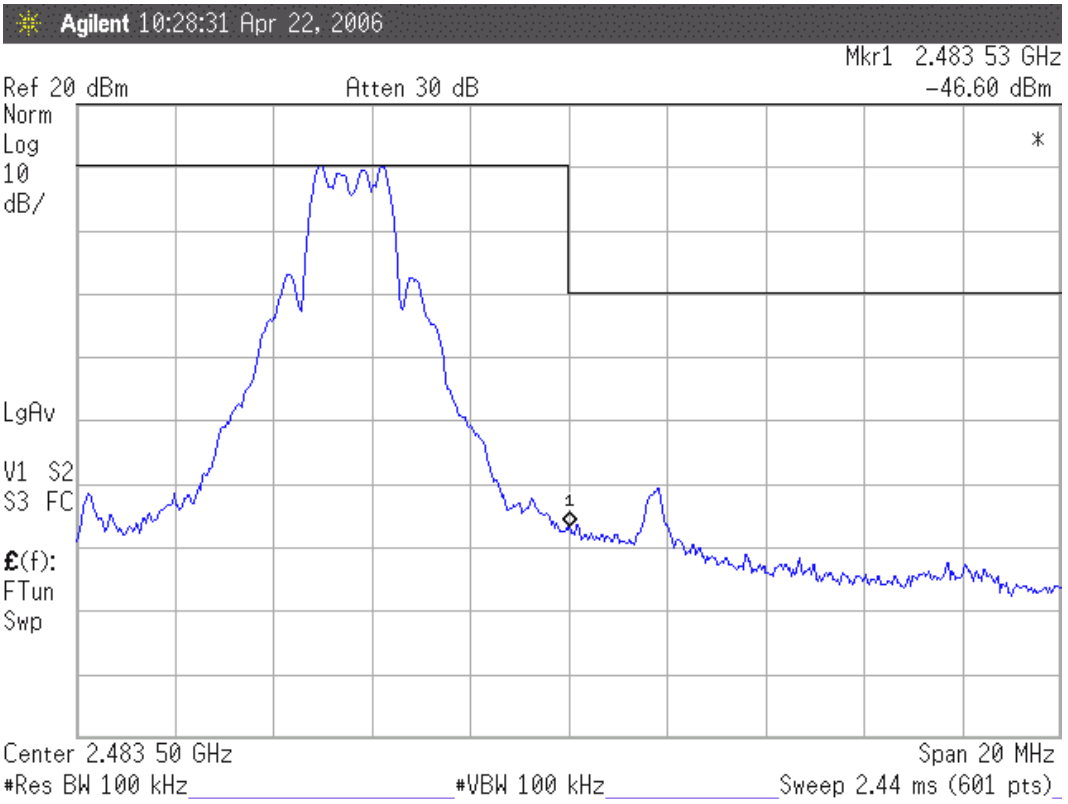
## 7.6. Test Results

**PASSED.** All the test results are attached in next pages.

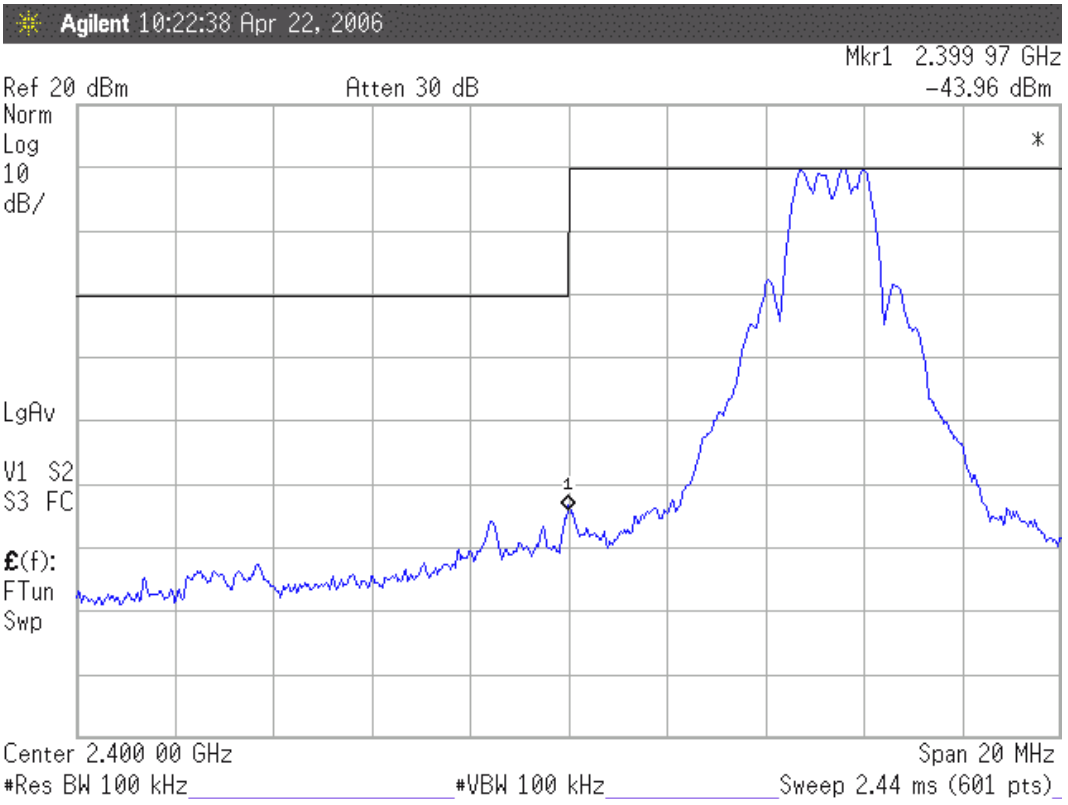
(Test Date : Apr. 22, 2006 Temperature : 26℃ Humidity : 62 %)

1. Below Band edge: The highest emission level is –46.60dBm on 2.48353GHz。
2. Upper Band edge : The highest emission level is –43.96dBm on 2.39997GHz。

## Below Band edge




## Upper Band edge



# 8. POWER SPECTRAL DENSITY MEASUREMENT

## 8.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

| Item | Type | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | HP | 8564EC | 3946A00249 | Nov. 20, 05' | Nov. 19, 06' |

## 8.2. Block Diagram of Test Setup

The same as section.4.2.

## 8.3. Specification Limits (§15.247(d))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

## 8.4. Operating Condition of EUT

The test program "Futaba Term" was used to enable the EUT to transmit data at different channel frequency individually.

## 8.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz.

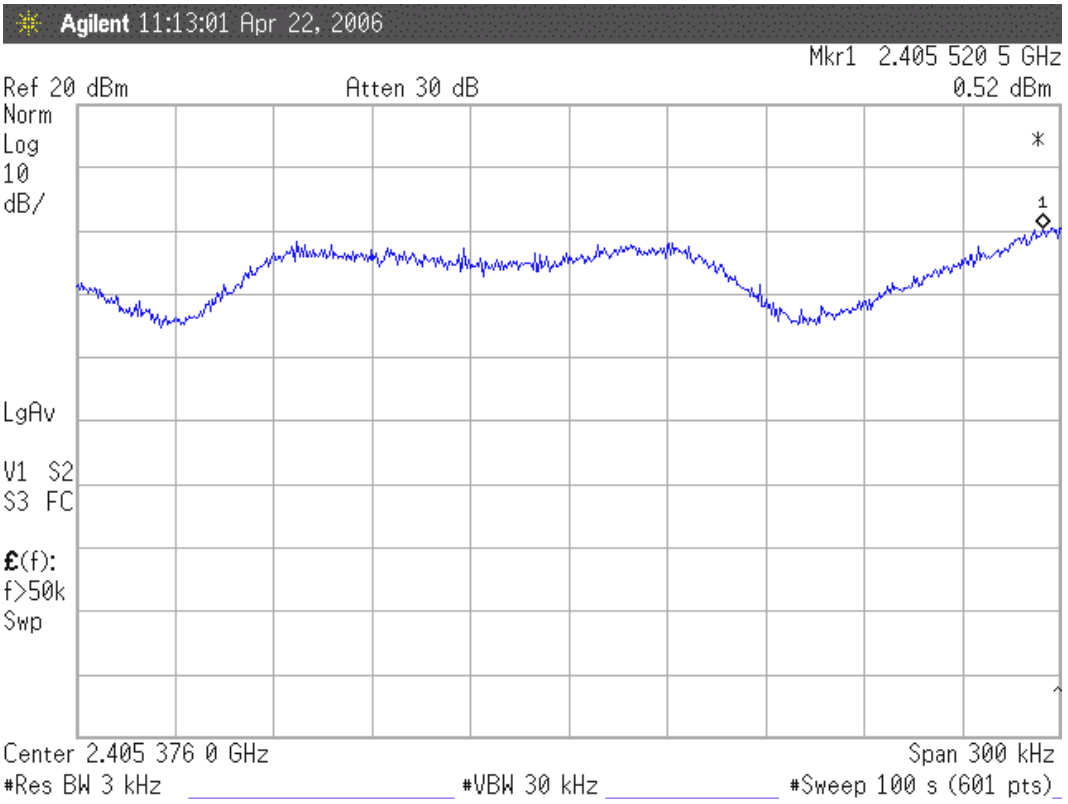
## 8.6. Test Results

**PASSED.** All the test results are attached in next pages.

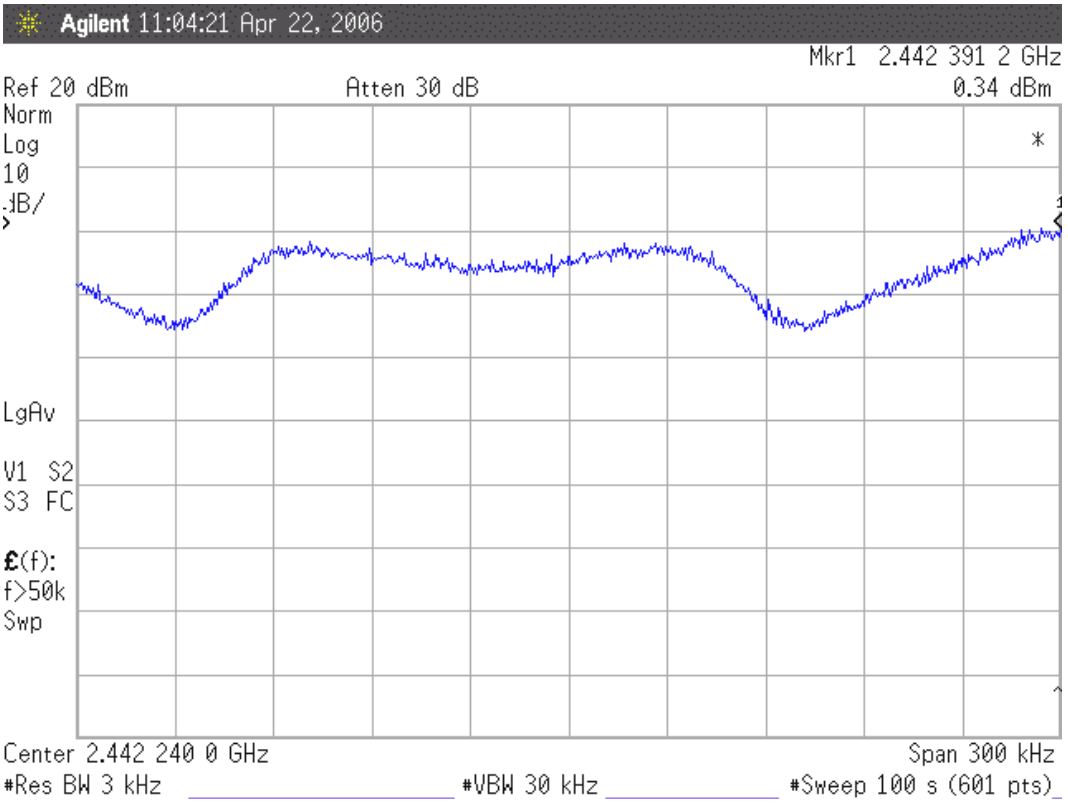
(Test Date : Apr. 21, 2006 Temperature : 26℃ Humidity : 42 %)

| Channel | Frequency | **Power Spectral Density** | Limit |
|---|---|---|---|
| 02 | 2405.376MHz | **0.52dBm** | 8dBm |
| 38 | 2442.270MHz | **0.34dBm** | 8dBm |
| 74 | 2479.104MHz | **1.28dBm** | 8dBm |

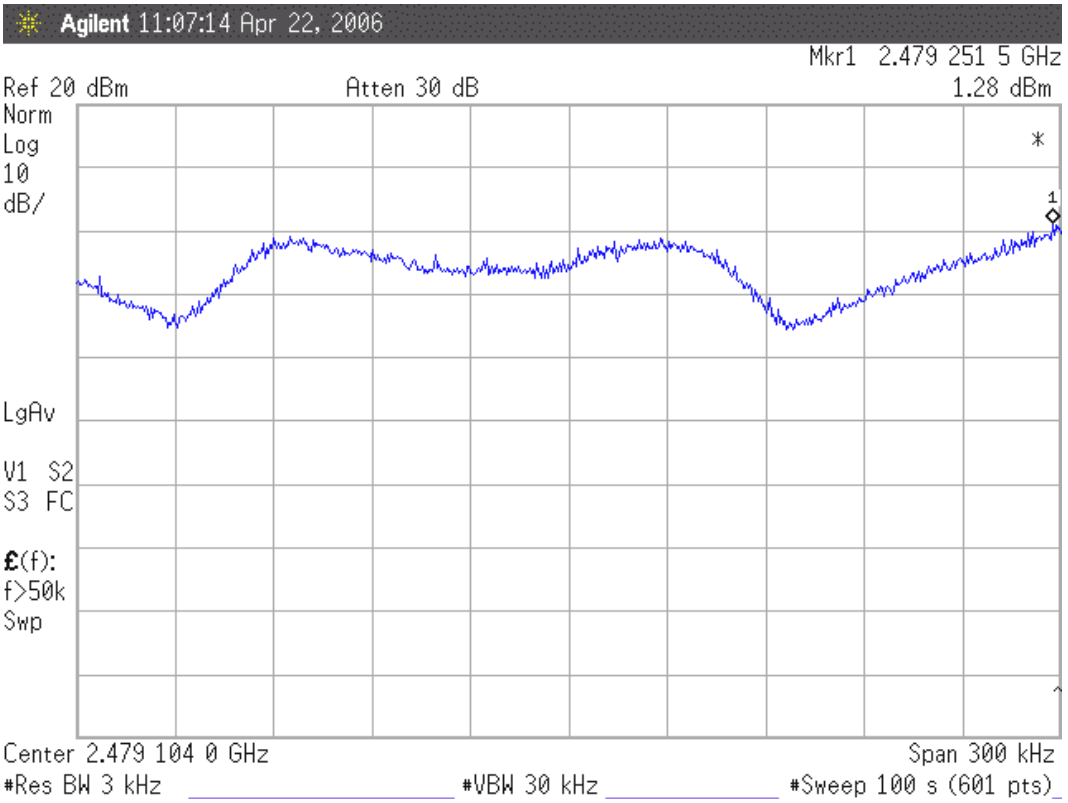
**Frequency: 2405.376MHz**




**Frequency: 2442.240MHz**



**Frequency: 2479.104MHz**



# 9. DEVIATION TO TEST SPECIFICATIONS

【NONE】