# FCC TEST REPORT

**REPORT NO.:** RF941216H03

**MODEL NO.:** M-RBT105A

**RECEIVED:** Dec. 16, 2005

**TESTED:** Dec. 22, 2005

**ISSUED:** Dec. 27, 2005

**APPLICANT:** LOGITECH FAR EAST LTD.

**ADDRESS:** #2 Creation Rd. 4, Science-Based Ind. Park
Hsinchu Taiwan, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien,
Taiwan, R.O.C.



0536
ILAC MRA

No. 2177-01

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# 1 CERTIFICATION

| | |
|---|---|
| **PRODUCT :** | Cordless Mouse |
| **BRAND NAME :** | Logitech |
| **MODEL NO :** | M-RBT105A |
| **TESTED:** | Dec. 22, 2005 |
| **APPLICANT :** | LOGITECH FAR EAST LTD. |
| **STANDARDS :** | 47 CFR Part 15, Subpart C (Section 15.249), ANSI C63.4-2003 |

The above equipment (Model: M-RBT105A) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** _____ , **DATE:** Dec. 27, 2005
( Midoli Peng )

**TECHNICAL ACCEPTANCE :** _____ , **DATE:** Dec. 27, 2005
Responsible for RF
( Hank Chung )

**APPROVED BY :** _____ , **DATE:** Dec. 27, 2005
( May Chen, Deputy Manager )

# 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: 47 CFR Part 15, Subpart C | | | |
|---|---|---|---|
| **Standard Paragraph** | **Test Type** | **Result** | **Remark** |
| 15.207 | Conducted Emission Test | NA | Power supply is 1.5VDC from batteries |
| 15.249 | Radiated Emission Test | PASS | Minimum passing margin is –14.60dB at 25.40MHz |
| 15.249 | Band Edge Measurement | PASS | Meet the requirement of limit |

# 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | Cordless Mouse |
| **MODEL NO.** | M-RBT105A |
| **POWER SUPPLY** | 1.5VDC from batteries |
| **MODULATION TYPE** | GFSK |
| **CARRIER FREQUENCY OF EACH CHANNEL** | 2402 MHz, 2420 MHz, 2421 MHz, 2422 MHz, 2423 MHz, 2424 MHz, 2425 MHz, 2426 MHz, 2448 MHz, 2449 MHz, 2450 MHz, 2451 MHz, 2452 MHz, 2453 MHz, 2454 MHz, 2471 MHz, 2472 MHz, 2473 MHz, 2474 MHz, 2475 MHz, 2476 MHz, 2477 MHz, 2478 MHz, 2479 MHz |
| **NUMBER OF CHANNEL** | 24 |
| **ANTENNA TYPE** | Printed antenna with -2.18dBi antenna gain |
| **DATA CABLE** | NA |
| **I/O PORTS** | NA |
| **ASSOCIATED DEVICES** | NA |

**NOTE:**

1. The EUT is the transmitter part of Cordless Mouse.
2. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

## 3.2 DESCRIPTION OF TEST MODES

Twenty-four channels are provided in this EUT.

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 0 | 2402 MHz | 12 | 2452 MHz |
| 1 | 2420 MHz | 13 | 2463 MHz |
| 2 | 2421 MHz | 14 | 2464 MHz |
| 3 | 2422 MHz | 15 | 2471 MHz |
| 4 | 2423 MHz | 16 | 2472 MHz |
| 5 | 2424 MHz | 17 | 2473 MHz |
| 6 | 2425 MHz | 18 | 2474 MHz |
| 7 | 2426 MHz | 19 | 2475 MHz |
| 8 | 2448 MHz | 20 | 2476 MHz |
| 9 | 2449 MHz | 21 | 2477 MHz |
| 10 | 2450 MHz | 22 | 2478 MHz |
| 11 | 2451 MHz | 23 | 2479 MHz |

**NOTE:**

1. Below 1 GHz, the channel 0, 8, and 23 were pre-tested in chamber. The channel 0, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 0, 8, and 23 were tested individually.

## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is the transmitter part of a Cordless Mouse. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

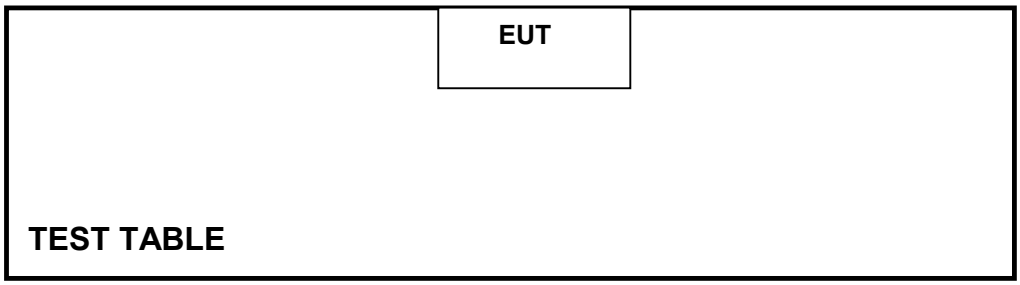
**47 CFR Part 15, Subpart C (Section 15.249)**
**ANSI C63.4: 2003**

All tests have been performed and recorded as per the above standards.

## 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.

## 3.5 CONFIGURATION OF SYSTEM UNDER TEST




**NOTE:** 1. Please refer to the photos of test configuration in Item 5 also.

# 4 TEST PROCEDURES AND RESULTS

## 4.1 CONDUCTED EMISSION MEASUREMENT

NA

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.249 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

| Fundamental Frequency (MHz) | Field Strength of Fundamental (dBuV/m) | |
|---|---|---|
| | Peak | Average |
| 2400 ~ 2483.5 | 114 | 94 |
| | Field Strength of Harmonics (dBuV/m) | |
| | 74 | 54 |

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequencies (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

## 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ADVANTEST Spectrum Analyzer | R3271A | 85060311 | July 07, 2006 |
| HP Pre_Amplifier | 8449B | 3008A01922 | Oct. 02, 2006 |
| ROHDE & SCHWARZ Test Receiver | ESCS30 | 100287 | Dec. 08, 2006 |
| CHASE Broadband Antenna | VULB9168 | 138 | Dec. 21, 2006 |
| Schwarzbeck Horn_Antenna | BBHA9120 | D124 | Dec. 11, 2006 |
| Schwarzbeck Horn_Antenna | BBHA 9170 | BBHA9170153 | Jan. 30, 2006 |
| SCHWARZBECK Biconical Antenna | VHBA9123 | 459 | Jun. 26, 2006 |
| SCHWARZBECK Periodic Antenna | UPA6108 | 1148 | Jun. 26, 2006 |
| RF Switches (ARNITSU) | CS-201 | 1565157 | NA |
| RF CABLE (Chaintek) 1GHz-20GHz | SF102 | 22054-2 | Nov. 16. 2006 |
| RF Cable(RICHTEC) | 9913-30M | STCCAB-30M-1GHz-021 | Jul. 16, 2006 |
| Software | ADT_Radiated_V5.14 | NA | NA |
| CHANCE MOST Antenna Tower | AT-100 | 0203 | NA |
| CHANCE MOST Turn Table | TT-100 | 0203 | NA |

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Periodic Antenna)and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824-3.
7. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Measurement | Value |
|---|---|
| Radiated emissions (30MHz-1GHz) | 2.98 dB |
| Radiated emissions (1GHz ~18GHz) | 2.21 dB |
| Radiated emissions (18GHz ~20GHz) | 1.88 dB |

### 4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

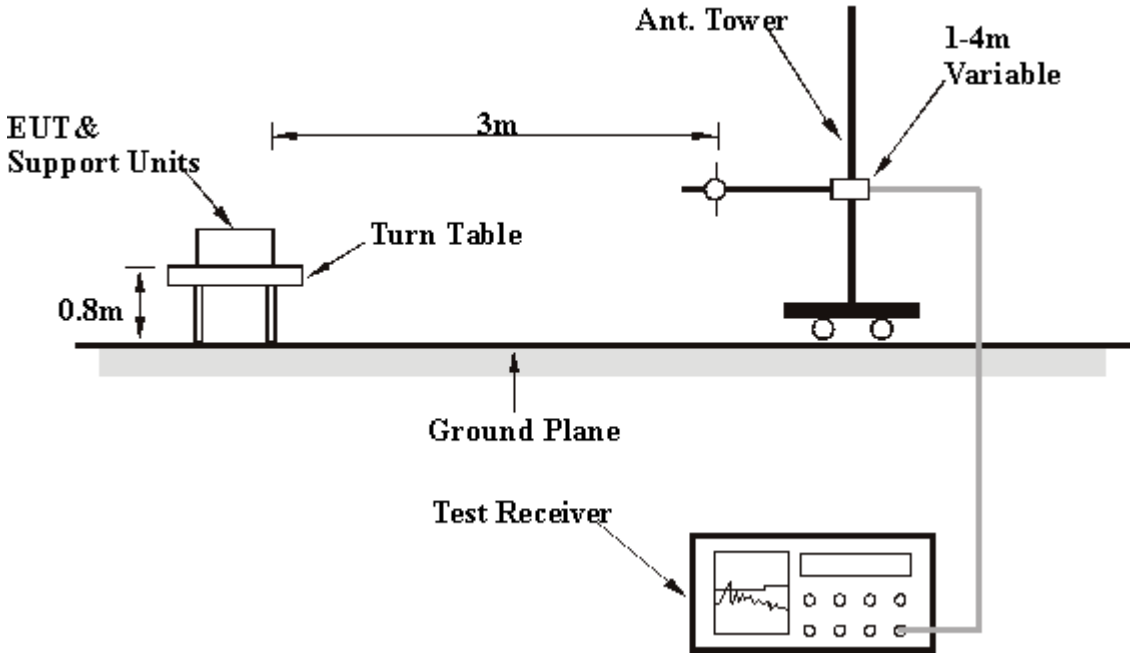
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.2.5 TEST SETUP




For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 4.2.6 EUT OPERATING CONDITIONS

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

## 4.2.7 TEST RESULTS

| | | | |
|---|---|---|---|
| **EUT** | Cordless Mouse | **MODEL** | M-RBT105A |
| **MODE** | Channel 0 | **INPUT POWER** | 1.5 VDC |
| **FREQUENCY RANGE** | 30-1000 MHz | **DETECTOR FUNCTION & BANDWIDTH** | Quasi-Peak, 120kHz |
| **ENVIRONMENTAL CONDITIONS** | 19 deg. C, 54%RH, 970 hPa | **TESTED BY** | Tony Chen |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 57.20 | 20.70 QP | 40.00 | -19.30 | 2.22 H | 70 | 6.90 | 13.90 |
| 2 | 175.16 | 21.80 QP | 43.50 | -21.70 | 1.88 H | 159 | 9.00 | 12.90 |
| 3 | 186.47 | 19.00 QP | 43.50 | -24.50 | 2.03 H | 56 | 6.90 | 12.10 |
| 4 | 200.22 | 19.90 QP | 43.50 | -23.60 | 1.83 H | 82 | 8.70 | 11.20 |
| 5 | 381.07 | 19.80 QP | 46.00 | -26.20 | 1.09 H | 81 | 2.10 | 17.80 |
| 6 | 544.36 | 30.00 QP | 46.00 | -16.00 | 1.12 H | 139 | 7.80 | 22.10 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| **1** | **57.23** | **25.40 QP** | **40.00** | **-14.60** | **1.00 V** | **13** | **11.60** | **13.80** |
| 2 | 175.01 | 22.20 QP | 43.50 | -21.30 | 1.00 V | 88 | 9.40 | 12.90 |
| 3 | 185.99 | 25.60 QP | 43.50 | -17.90 | 1.49 V | 153 | 13.50 | 12.20 |
| 4 | 200.23 | 23.60 QP | 43.50 | -19.90 | 1.12 V | 27 | 12.50 | 11.20 |
| 5 | 381.01 | 25.00 QP | 46.00 | -21.00 | 1.09 V | 112 | 7.20 | 17.80 |
| 6 | 544.30 | 22.60 QP | 46.00 | -23.40 | 1.25 V | 177 | 0.50 | 22.10 |

**REMARKS**:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

| EUT | Cordless Mouse | MODEL | M-RBT105A |
|---|---|---|---|
| MODE | Channel 0 | INPUT POWER | 1.5 VDC |
| FREQUENCY RANGE | 1000~25000MHz | DETECTOR FUNCTION & BANDWIDTH | Peak (PK)<br>Average (AV)<br>1 MHz |
| ENVIRONMENTAL CONDITIONS | 19 deg. C, 59%RH, 970 hPa | TESTED BY | Tony Chen |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.00 | 43.30 PK | 74.00 | -30.70 | 1.92 H | 167 | 9.60 | 33.70 |
| 1 | 2390.00 | 23.90 AV | 54.00 | -30.10 | 1.92 H | 167 | -9.80 | 33.70 |
| 2 | *2402.00 | 91.10 PK | | | 1.92 H | 167 | 61.30 | 29.80 |
| 2 | *2402.00 | 71.70 AV | | | 1.92 H | 167 | 41.90 | 29.80 |
| 3 | 4804.00 | 56.40 PK | 74.00 | -17.60 | 1.58 H | 173 | 21.40 | 35.00 |
| 3 | 4804.00 | 37.00 AV | 54.00 | -17.00 | 1.58 H | 173 | 2.00 | 35.00 |
| 4 | 7306.00 | 48.60 PK | 74.00 | -25.40 | 1.57 H | 360 | 8.00 | 40.70 |
| 4 | 7306.00 | 29.20 AV | 54.00 | -24.80 | 1.57 H | 360 | -11.40 | 40.70 |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.00 | 38.30 PK | 74.00 | -35.70 | 1.82 V | 215 | 4.60 | 33.70 |
| 1 | 2390.00 | 18.90 AV | 54.00 | -35.10 | 1.82 V | 215 | -14.80 | 33.70 |
| 2 | *2402.00 | 86.10 PK | | | 1.82 V | 215 | 56.30 | 29.80 |
| 2 | *2402.00 | 66.70 AV | | | 1.82 V | 215 | 36.90 | 29.80 |
| 3 | 4804.00 | 55.70 PK | 74.00 | -18.30 | 1.23 V | 189 | 20.70 | 35.00 |
| 3 | 4804.00 | 36.30 AV | 54.00 | -17.70 | 1.23 V | 189 | 1.20 | 35.00 |
| 4 | 7236.00 | 48.90 PK | 74.00 | -25.10 | 1.82 V | 215 | 8.40 | 40.50 |
| 4 | 7236.00 | 29.50 AV | 54.00 | -24.50 | 1.82 V | 215 | -11.00 | 40.50 |

**REMARKS:**

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

| EUT | Cordless Mouse | MODEL | M-RBT105A |
|---|---|---|---|
| MODE | Channel 8 | INPUT POWER | 1.5 VDC |
| FREQUENCY RANGE | 1000~25000MHz | DETECTOR FUNCTION & BANDWIDTH | Peak (PK)<br>Average (AV)<br>1 MHz |
| ENVIRONMENTAL CONDITIONS | 19 deg. C, 59%RH, 970 hPa | TESTED BY | Tony Chen |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | *2448.00 | 93.20 PK | | | 2.00 H | 170 | 63.20 | 30.00 |
| 1 | *2448.00 | 73.80 AV | | | 2.00 H | 170 | 43.80 | 30.00 |
| 2 | 4896.00 | 55.30 PK | 74.00 | -18.70 | 1.52 H | 286 | 19.90 | 35.40 |
| 2 | 4896.00 | 35.90 AV | 54.00 | -18.10 | 1.52 H | 286 | 0.50 | 35.40 |
| 3 | 7344.00 | 49.00 PK | 74.00 | -25.00 | 1.94 H | 38 | 8.30 | 40.70 |
| 3 | 7344.00 | 29.10 AV | 54.00 | -24.90 | 1.94 H | 38 | -11.70 | 40.70 |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | *2448.00 | 87.20 PK | | | 1.76 V | 210 | 57.20 | 30.00 |
| 1 | *2448.00 | 67.80 AV | | | 1.76 V | 210 | 37.80 | 30.00 |
| 2 | 4896.00 | 57.50 PK | 74.00 | -16.50 | 1.69 V | 199 | 22.10 | 35.40 |
| 2 | 4896.00 | 37.60 AV | 54.00 | -16.40 | 1.69 V | 199 | 2.20 | 35.40 |
| 3 | 7344.00 | 47.80 PK | 74.00 | -26.20 | 1.75 V | 71 | 7.10 | 40.70 |
| 3 | 7344.00 | 28.40 AV | 54.00 | -25.60 | 1.75 V | 71 | -12.30 | 40.70 |

**REMARKS:**

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

| EUT | Cordless Mouse | MODEL | M-RBT105A |
|---|---|---|---|
| MODE | Channel 23 | INPUT POWER | 1.5 VDC |
| FREQUENCY RANGE | 1000~25000MHz | DETECTOR FUNCTION & BANDWIDTH | Peak (PK)<br>Average (AV)<br>1 MHz |
| ENVIRONMENTAL CONDITIONS | 19 deg. C, 59%RH, 970 hPa | TESTED BY | Tony Chen |

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | *2479.00 | 92.10 PK | | | 1.87 H | 200 | 62.00 | 30.10 |
| 1 | *2479.00 | 72.70 AV | | | 1.87 H | 200 | 42.60 | 30.10 |
| 2 | 2483.50 | 46.80 PK | 74.00 | -27.20 | 1.87 H | 200 | 16.70 | 30.10 |
| 2 | 2483.50 | 27.40 AV | 54.00 | -26.60 | 1.87 H | 200 | -2.70 | 30.10 |
| 3 | 4958.00 | 54.10 PK | 74.00 | -19.90 | 1.35 H | 285 | 18.40 | 35.70 |
| 3 | 4958.00 | 34.70 AV | 54.00 | -19.30 | 1.35 H | 285 | -1.00 | 35.70 |
| 4 | 7437.00 | 50.10 PK | 74.00 | -23.90 | 1.21 H | 233 | 9.10 | 40.90 |
| 4 | 7437.00 | 30.70 AV | 54.00 | -23.30 | 1.21 H | 233 | -10.30 | 40.90 |

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

| No. | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 1 | *2479.00 | 87.90 PK | | | 1.74 V | 221 | 57.80 | 30.10 |
| 1 | *2479.00 | 68.50 AV | | | 1.74 V | 221 | 38.40 | 30.10 |
| 2 | 2483.50 | 42.60 PK | 74.00 | -31.40 | 1.74 V | 221 | 12.50 | 30.10 |
| 2 | 2483.50 | 23.20 AV | 54.00 | -30.80 | 1.74 V | 221 | -6.90 | 30.10 |
| 3 | 4958.00 | 54.10 PK | 74.00 | -19.90 | 1.26 V | 56 | 18.50 | 35.70 |
| 3 | 4958.00 | 34.70 AV | 54.00 | -19.30 | 1.26 V | 56 | -0.90 | 35.70 |
| 4 | 7437.00 | 51.00 PK | 74.00 | -23.00 | 1.27 V | 236 | 10.00 | 40.90 |
| 4 | 7437.00 | 31.60 AV | 54.00 | -22.40 | 1.27 V | 236 | -9.40 | 40.90 |

**REMARKS:**

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

## 4.3 BAND EDGES MEASUREMENT

### 4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

### 4.3.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100036 | Nov. 23, 2006 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

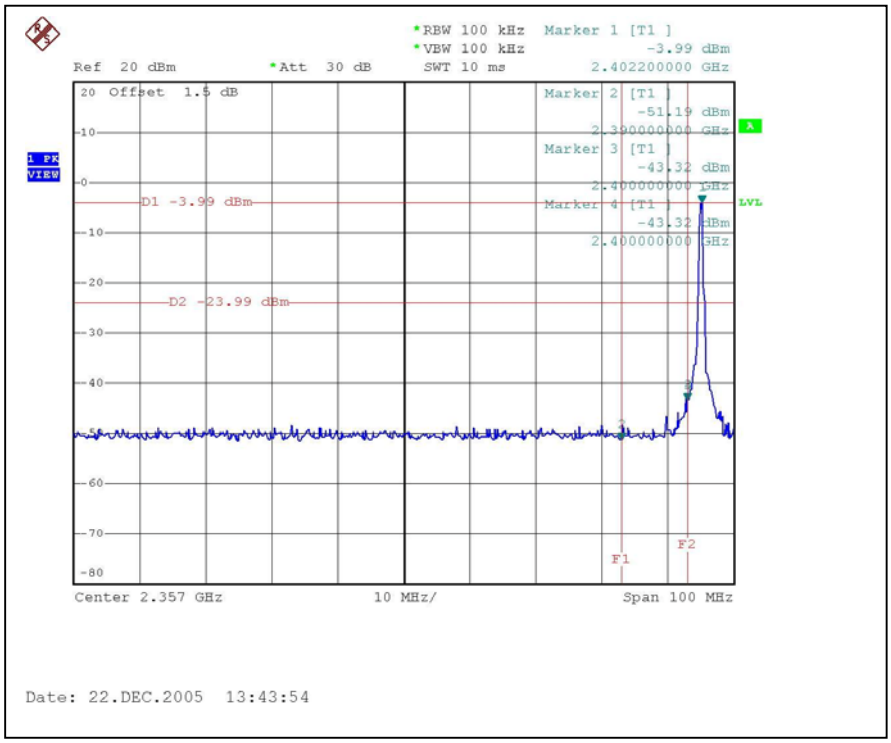
### 4.3.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

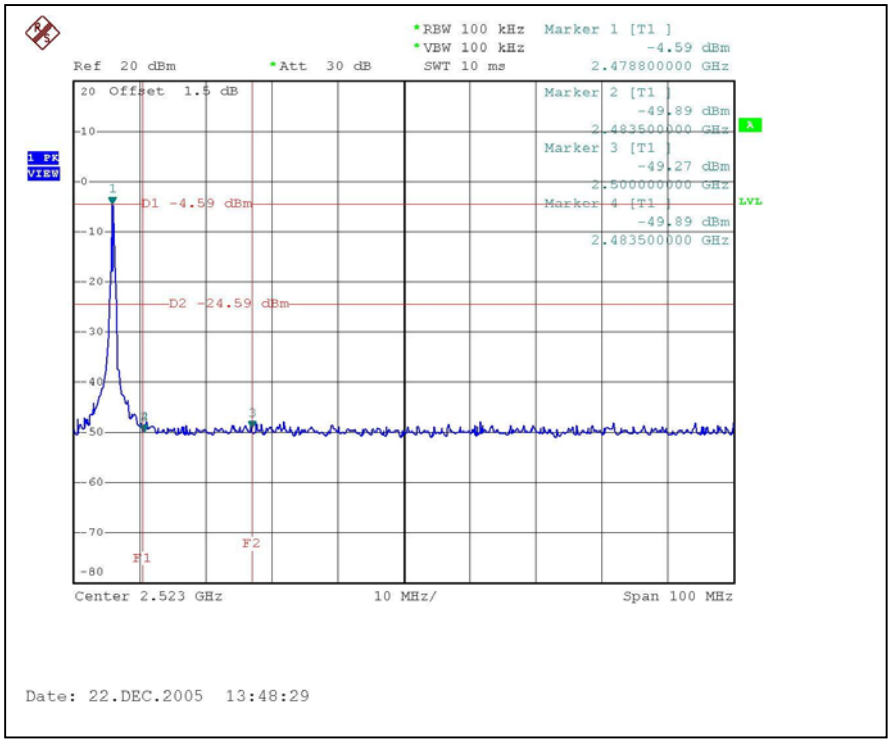
## 4.3.6 TEST RESULTS

Emissions radiated outside of the specified frequency bands, please refer pages form 8 to 16 for met the requirement of the general radiated emission limits in § 15.209.

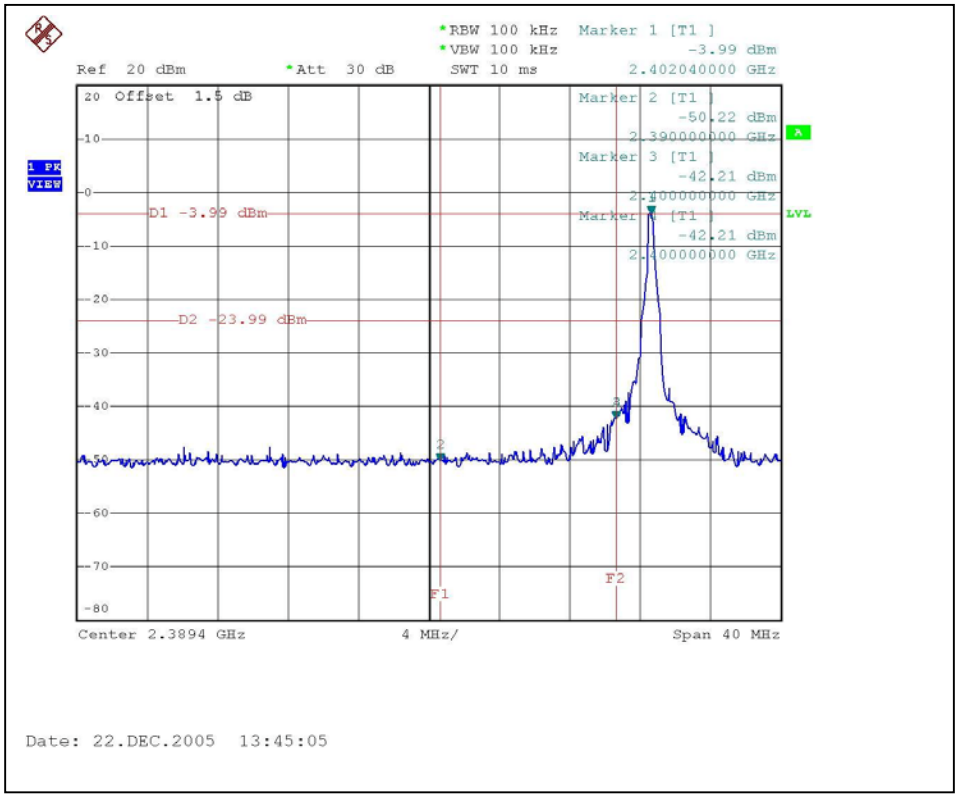
CH0



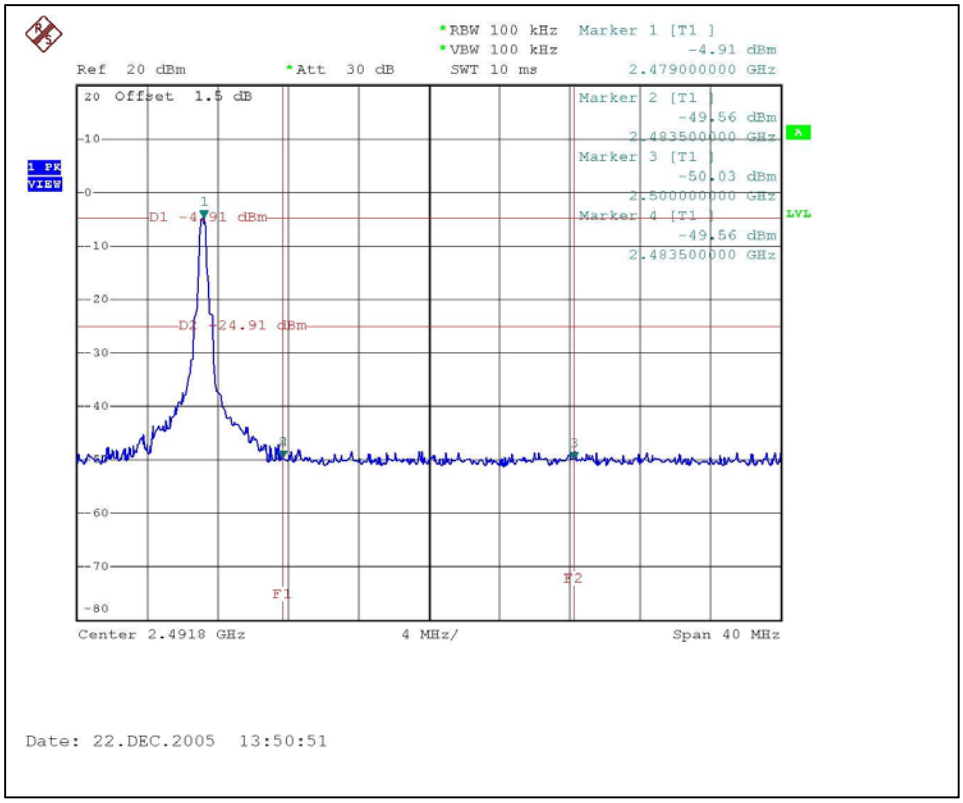

CH23



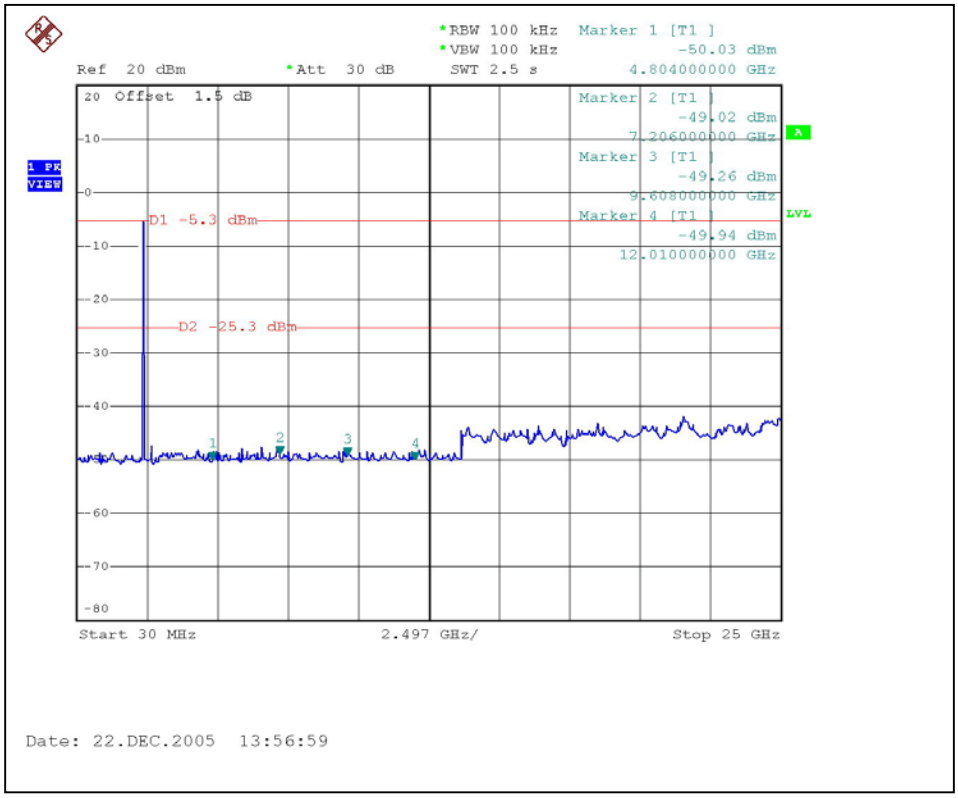
CH0


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 10 ms
Marker 1 [T1 ]
-3.99 dBm
2.402040000 GHz
20 Offset 1.5 dB
Marker 2 [T1 ]
-50.22 dBm
2.390000000 GHz
Marker 3 [T1 ]
-42.21 dBm
Marker 4 [T1 ]
-42.21 dBm
D1 -3.99 dBm
D2 -23.99 dBm
1 PK VIEW
LVL
F1
F2
Center 2.3894 GHz
4 MHz/
Span 40 MHz
Date: 22.DEC.2005 13:45:05

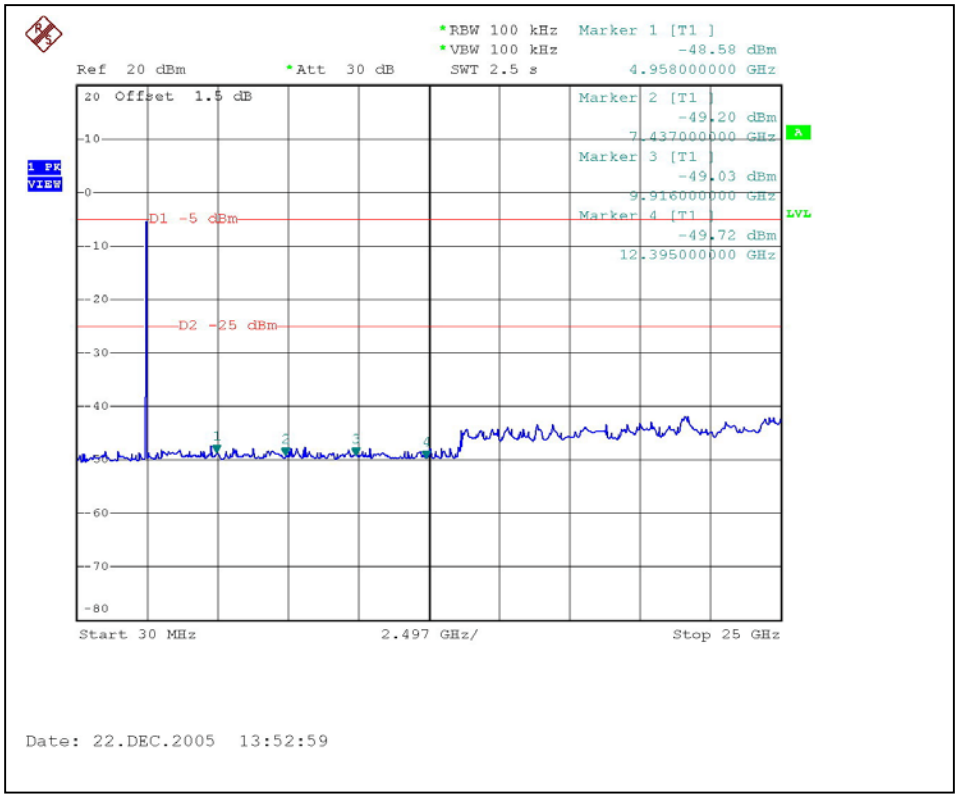
CH23


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 10 ms
Marker 1 [T1 ]
-4.91 dBm
2.479000000 GHz
20 Offset 1.5 dB
Marker 2 [T1 ]
-49.56 dBm
2.483500000 GHz
Marker 3 [T1 ]
-50.03 dBm
Marker 4 [T1 ]
-49.56 dBm
D1 -4.91 dBm
D2 -24.91 dBm
1 PK VIEW
LVL
F1
F2
Center 2.4918 GHz
4 MHz/
Span 40 MHz
Date: 22.DEC.2005 13:50:51

CH0


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 2.5 s
Marker 1 [T1 ]
-50.03 dBm
4.804000000 GHz
20 Offset 1.5 dB
Marker 2 [T1 ]
-49.02 dBm
7.206000000 GHz
Marker 3 [T1 ]
-49.26 dBm
9.608000000 GHz
Marker 4 [T1 ]
-49.94 dBm
12.010000000 GHz
1 PK VIEW
D1 -5.3 dBm
D2 -25.3 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Date: 22.DEC.2005 13:56:59

CH23


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 2.5 s
Marker 1 [T1 ]
-48.58 dBm
4.958000000 GHz
20 Offset 1.5 dB
Marker 2 [T1 ]
-49.20 dBm
7.437000000 GHz
Marker 3 [T1 ]
-49.03 dBm
9.916000000 GHz
Marker 4 [T1 ]
-49.72 dBm
12.395000000 GHz
1 PK VIEW
D1 -5 dBm
D2 -25 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Date: 22.DEC.2005 13:52:59

# 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST


# 6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:

| | |
|---|---|
| **USA** | FCC, NVLAP, UL, A2LA |
| **Germany** | TUV Rheinland |
| **Japan** | VCCI |
| **Norway** | NEMKO |
| **Canada** | INDUSTRY CANADA, CSA |
| **R.O.C.** | CNLA, BSMI, DGT |
| **Netherlands** | Telefication |
| **Singapore** | PSB, GOST-ASIA (MOU) |
| **Russia** | CERTIS (MOU) |

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab**:
Tel: 886-2-26052180
Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab**:
Tel: 886-3-5935343
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab**:
Tel: 886-3-3183232
Fax: 886-3-3185050

**Email**: service@adt.com.tw
**Web Site**: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

# APPENDIX-A

## MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.