# FCC TEST REPORT

| | |
|---|---|
| CATEGORY: | Portable End Product |
| PRODUCT NAME: | **Wireless 3D trackball keyboard** |
| FCC ID.: | SHSZY2004 |
| FILING TYPE: | Certification |
| MODEL NAME: | SKM-2001 |
| APPLICANT: | **SHEN ZHEN ZHANG YUAN CORPORATION LIMITED**<br>Industry Rd. 2, No. 10, Zhuang Bian, He Xi Industrial District, Xi Xiang Town, Bao An District, Shen Zhen City |
| MANUFACTURER: | Same as Applicant |
| ISSUED BY: | **SPORTON INTERNATIONAL INC.**<br>6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien, Taiwan, R.O.C. |

## Statements:

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA, NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.

Dr. Alan Lane
Vice General Manager

NVLAP®
Lab Code: 200079-0

# Table of Contents

# History of this test report

■ No additional attachment.

☐ Additional attachment were issued as following record:

| Attachment No. | Issue Date | Description |
|---|---|---|
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# 1. General Description of Equipment Under Test

## 1.1. Applicant

**SHEN ZHEN ZHANG YUAN CORPORATION LIMITED**

Industry Rd. 2, No. 10, Zhuang Bian, He Xi Industrial District, Xi Xiang Town, Bao An District, Shen Zhen City

## 1.2. Manufacturer

Same as 1.1

## 1.3. Basic Description of Equipment under Test

This product is a Wireless 3D trackball keyboardand. The technical data has been listed on section " Features of Equipment under Test ".

## 1.4. Features of Equipment under Test

| ITEMS | DESCRIPTION |
|---|---|
| Type of Modulation | FSK |
| Number of Channel | 1 |
| Carrier Frequency of each channel | 27.09MHz |
| Type of Antenna | Wired Antenna |
| Function Type | Transmitter |
| Power Rating (DC/AC, Voltage) | 3 VDC from battery |
| Duty Cycle | 10% |
| Temperature Range (Operating) | -10 ~ 50℃ |

# 2. Test Configuration of the Equipment Under Test

## 2.1. Description of the Test

a) The used peripherals as well as the configuration fulfill the requirements of ANSI C63.4:2001. The configuration is operated in a manner which tends to maximize its emission characteristics in a typical application.

b) 3 meters measurement distance was used in this test.

## 2.2. Frequency Range Investigated

a) Radiated emission test: from 30 MHz to 1000MHz.

## 2.3. Details of the Supporting Units

Support Unit 1. – Personal Computer (COMPAQ)

| | |
|---|---|
| FCC ID | : N/A |
| Model No. | : D380mx |
| Power Supply Type | : Switching |
| Power Cord | : Non-Shielded |
| Serial No. | : SP0004 |

Support Unit 2. -- Monitor (VIEWSONIC)

| | |
|---|---|
| FCC ID | : N/A |
| Model No. | : VCDTS21553-3P |
| Power Supply Type | : Switching |
| Power Cord | : Non-Shielded |
| Data Cable | : Shielded, 1.7m |
| Remark | : This support device was tested to comply with FCC standards and authorized under a declaration of conformity. |

Support Unit 3. –Keyboard (LOGITECH)

| | |
|---|---|
| FCC ID | : N/A |
| Model No. | : Y-S-117 |
| Data Cable | : Shielded, 360 degree via metal backshells, 1.7m |
| Remark | : This support device was tested to comply with FCC standards and authorized under a declaration of conformity. |

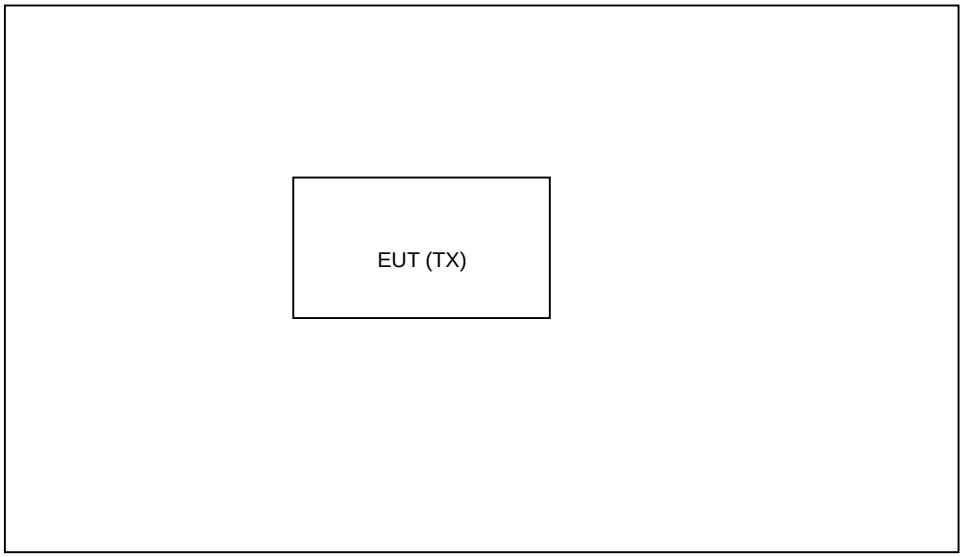
Support Unit 4. –Mouse (LOGITECH)

| | |
|---|---|
| FCC ID | : N/A |
| Model No. | : M-S34 |
| Data Cable | : Shielded, 360 degree via metal backshells, 1.7m |
| Remark | : This support device was tested to comply with FCC standards and authorized under a declaration of conformity. |

Support Unit 6. -- Modem (ACEEX) – for local workstation

| | |
|---|---|
| FCC ID | : IFAXDM141 |
| Model No. | : DM141 |
| Power Supply Type | : Linear |
| Power Cord | : Non-Shielded |
| Serial No. | : SP0049 |
| Data Cable | : Shielded, 1.15m |
| Remark | : This support device was tested to comply with FCC standards and authorized under a declaration of conformity. |

## 2.4. Connection Diagram of Test System



# 3. Test Software

No test software is required for this testing.

# 4. Test Location and Standards

## 4.1. Test Location

**Test Location :** Sporton Hwa Ya Testing Building

**Address :** No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
Tel: +886 3 327 3456 Fax: +886 3 318 0055

**Test Site No. :** 03CH03-HY

## 4.2. Test Standards

Here is the list of the standards followed in this test report.

**ANSI C63.4-2001**

**47 CFR Part 15 Subpart C ( Section 15.227 )**

# 5. Band Edge

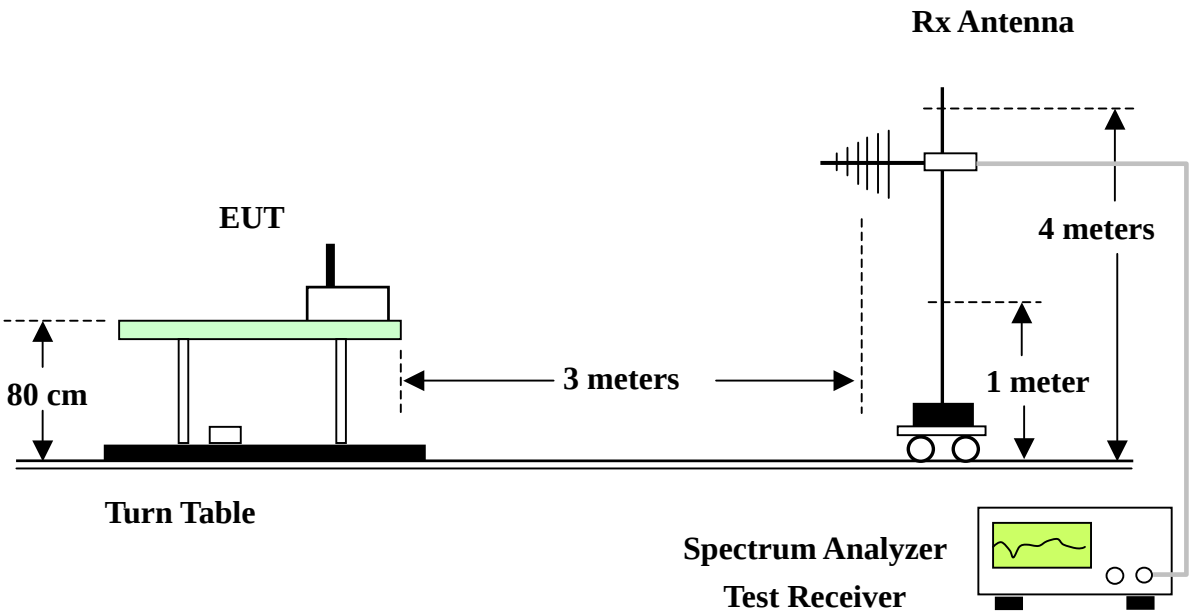
## 5.1. Measuring Instruments

Please reference item 1~8 in chapter 7 for the instruments used for testing.

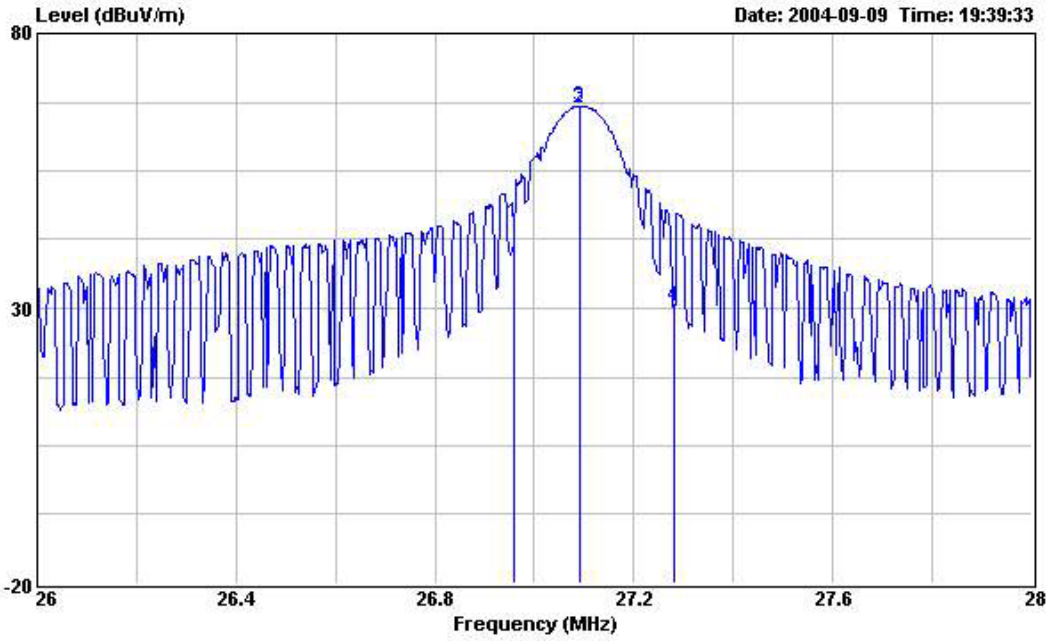
## 5.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turn table 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
4. Power on the EUT and all the supporting units.
5. The turn table was rotated 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

## 5.3. Test Setup Layout



## 5.4. Test Results




**RBW:120KHz,VBW:300KHz**

Conformation of the fundamental frequency

| Frequency | Level | Over Limit | Limit Line | Read Level | Probe Factor | Cable Loss | Preamp Factor |
|---|---|---|---|---|---|---|---|
| ( MHz ) | ( dBuV/m ) | ( dB ) | ( dBuV/m ) | ( dBuV ) | ( dB ) | ( dB ) | ( dB ) |
| 26.960 | 45.74 | -23.8 | 69.54 | 60.80 | 12.10 | 0.90 | 28.06 |
| 27.28 | 30.48 | -49.54 | 80.00 | 45.43 | 12.20 | 0.90 | 28.06 |

# 6. Carrier Field Strength

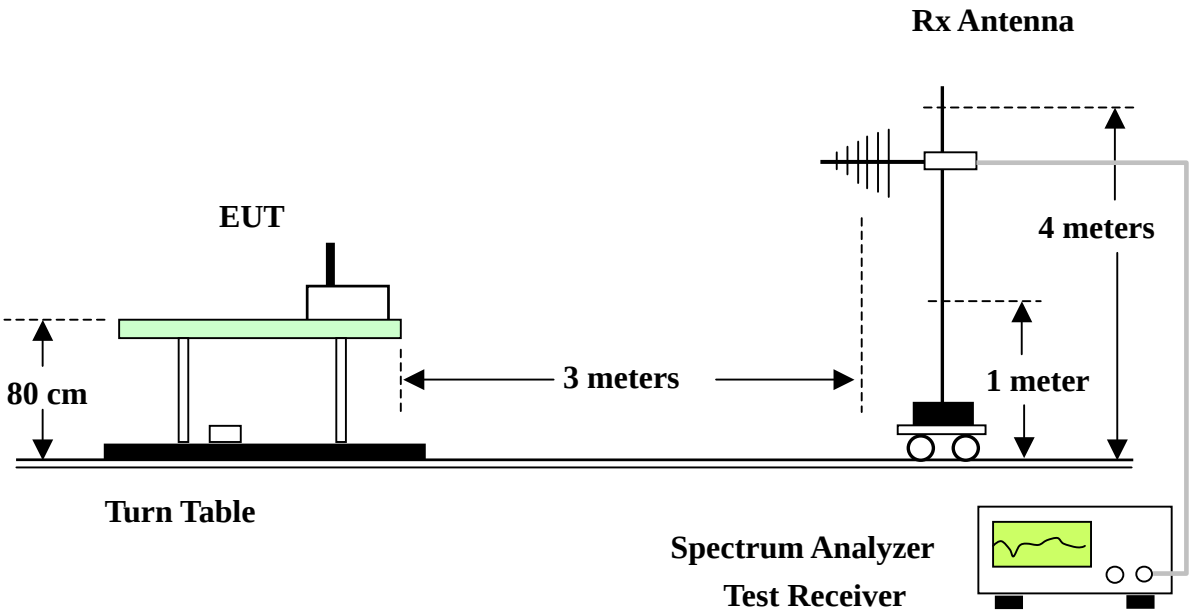
## 6.1. Measuring Instruments

Please reference item 1~8 in chapter 7 for the instruments used for testing.

## 6.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turn table 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
4. Power on the EUT and all the supporting units.
5. The turn table was rotated 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak and CISPR Average Detect Function with specified bandwidth under Maximum Hold Mode.
9. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

## 6.3. Test Setup Layout



## 6.4. Test Results and Limit

| Frequency ( MHz ) | Level ( dBuV/m ) | Over Limit ( dB ) | Limit Line ( dBuV/m ) | Read Level ( dBuV ) | Probe Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Remark |
|---|---|---|---|---|---|---|---|---|
| 27.090 | 66.73 | -2.81 | 69.54 | 81.75 | 12.14 | 0.90 | 28.06 | A.V. |
| 27.090 | 66.50 | -13.5 | 80.00 | 81.52 | 12.14 | 0.90 | 28.06 | Peak |

# 7. Conducted Emission Measurement

This device is battery powered. So the conducted power line test is not applicable to this EUT.

# 8. Test of Radiated Emission

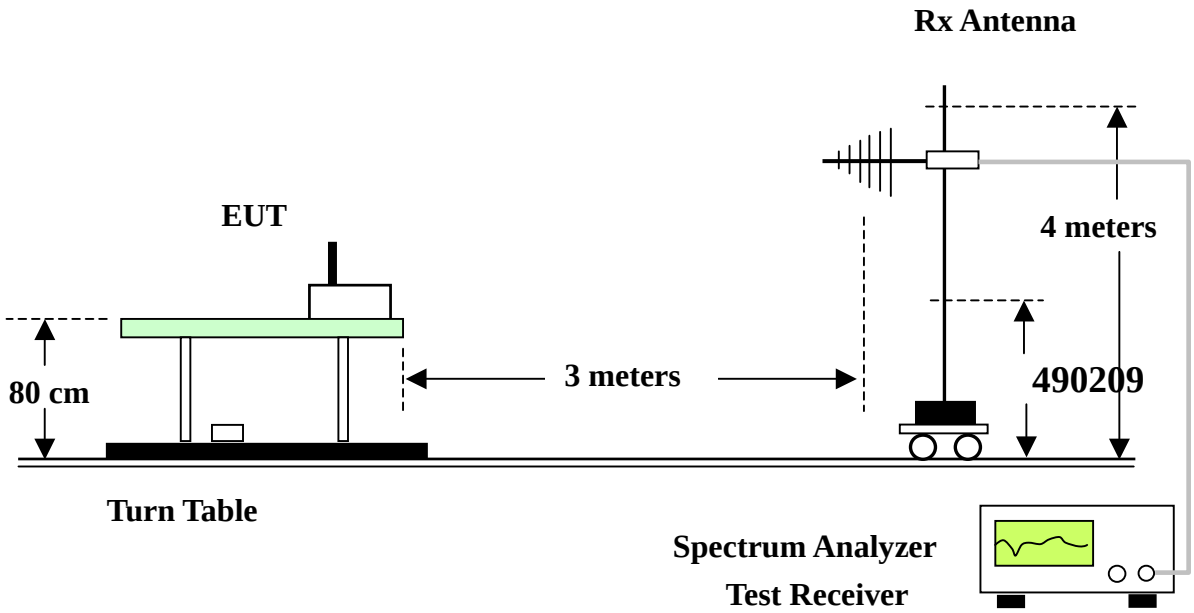
## 8.1. Measuring Instruments

Please reference item 1~8 in chapter 7 for the instruments used for testing.

## 8.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turn table 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
4. Power on the EUT and all the supporting units.
5. The turn table was rotated 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

## 8.3. Test Setup Layout

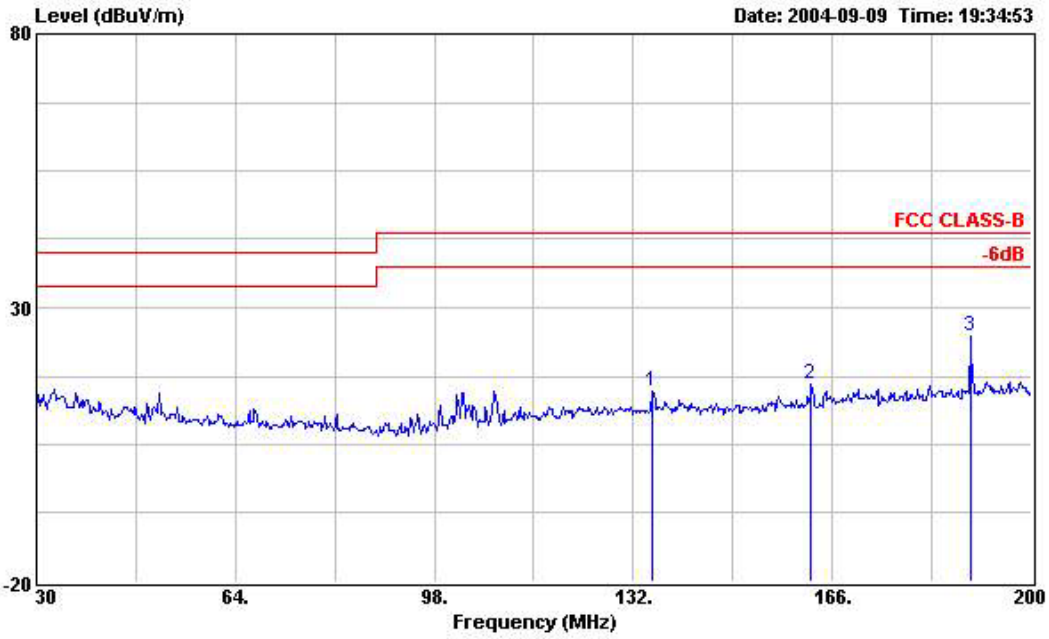


## 8.4. Test Results and Limit

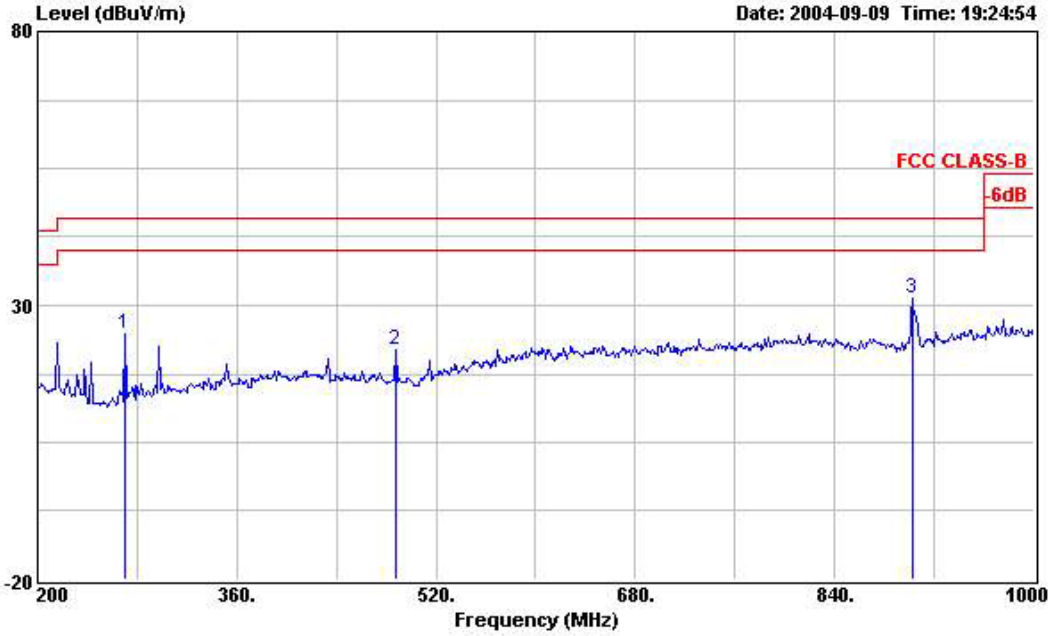
**Note:**
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

| Test Mode | TX | Temperature | 25deg. C | Tested By | Steve Chen |
|---|---|---|---|---|---|
| Freq. Range | 30MHz~1GHz | Humidity | 67 % | | |

***(A) Polarization: Horizontal***

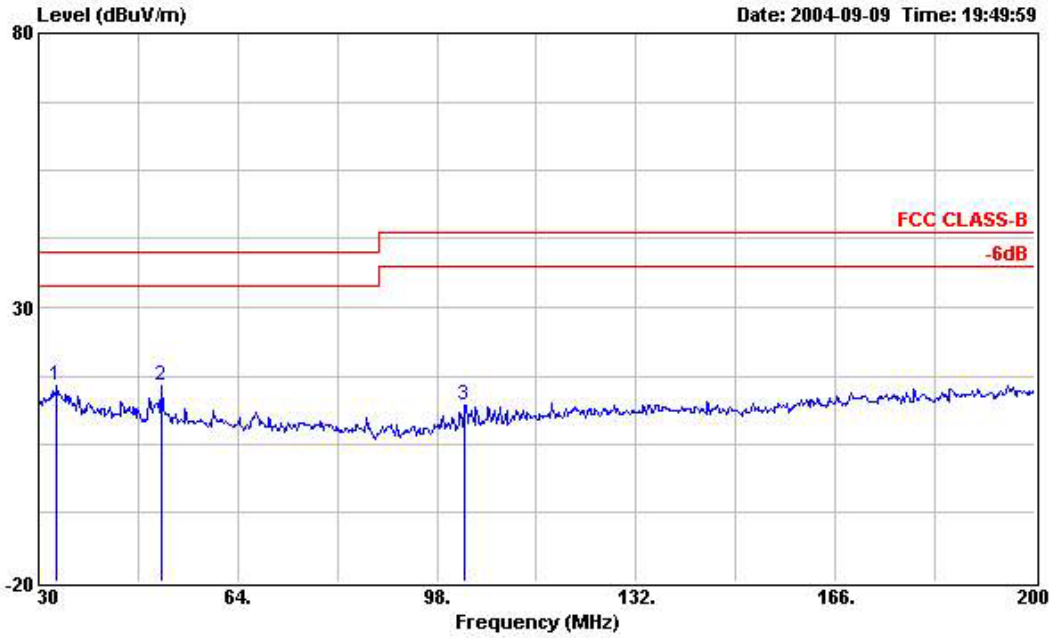



| | Freq | Level | Over Limit | Limit Line | Read Level | Probe Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB | | cm | deg |
| 1 | 135.230 | 14.75 | -28.75 | 43.50 | 28.12 | 12.47 | 1.99 | 27.83 | Peak | --- | --- |
| 2 | 162.430 | 16.06 | -27.44 | 43.50 | 28.65 | 12.86 | 2.32 | 27.77 | Peak | --- | --- |
| 3 | 189.630 | 24.87 | -18.63 | 43.50 | 35.15 | 14.97 | 2.47 | 27.72 | Peak | --- | --- |

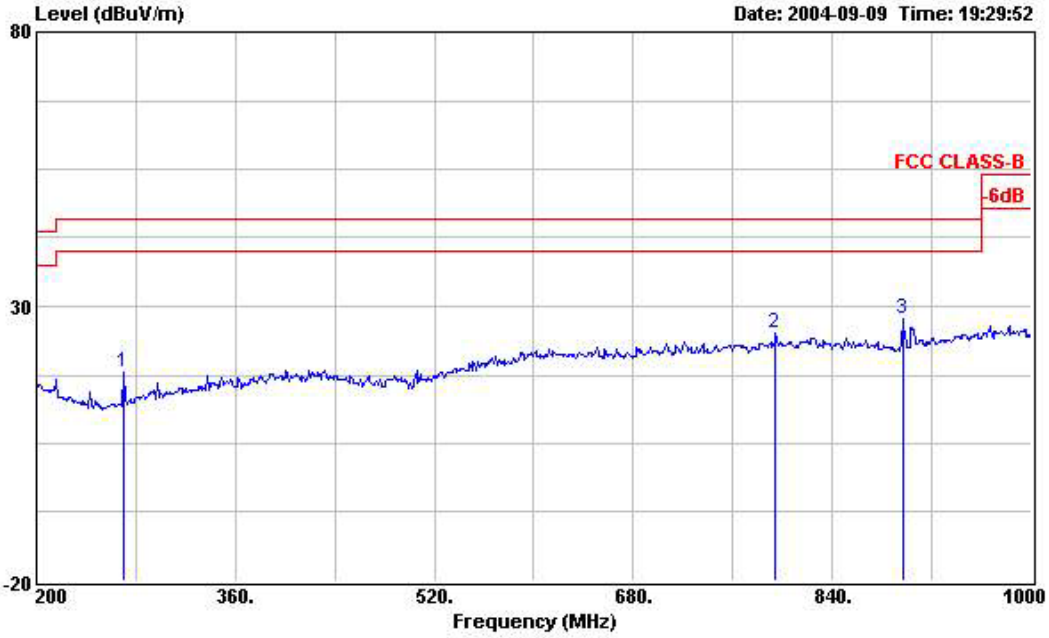



| | Freq | Level | Over Limit | Limit Line | Read Level | Probe Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB | | cm | deg |
| 1 | 269.600 | 24.66 | -21.34 | 46.00 | 36.24 | 12.89 | 2.95 | 27.42 | Peak | --- | --- |
| 2 | 487.200 | 21.94 | -24.06 | 46.00 | 30.58 | 16.10 | 3.84 | 28.58 | Peak | --- | --- |
| 3 | 902.400 | 31.27 | -14.73 | 46.00 | 32.47 | 21.75 | 5.35 | 28.30 | Peak | --- | --- |

***(B) Polarization: Vertical***




| | Freq | Level | Over Limit | Limit Line | Read Level | Probe Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB | | cm | deg |
| 1 | 33.060 | 15.69 | -24.31 | 40.00 | 30.41 | 12.33 | 0.99 | 28.04 | Peak | --- | --- |
| 2 | 50.910 | 15.60 | -24.40 | 40.00 | 31.08 | 11.32 | 1.20 | 28.00 | Peak | --- | --- |
| 3 | 102.590 | 12.16 | -31.34 | 43.50 | 28.88 | 9.36 | 1.81 | 27.89 | Peak | --- | --- |



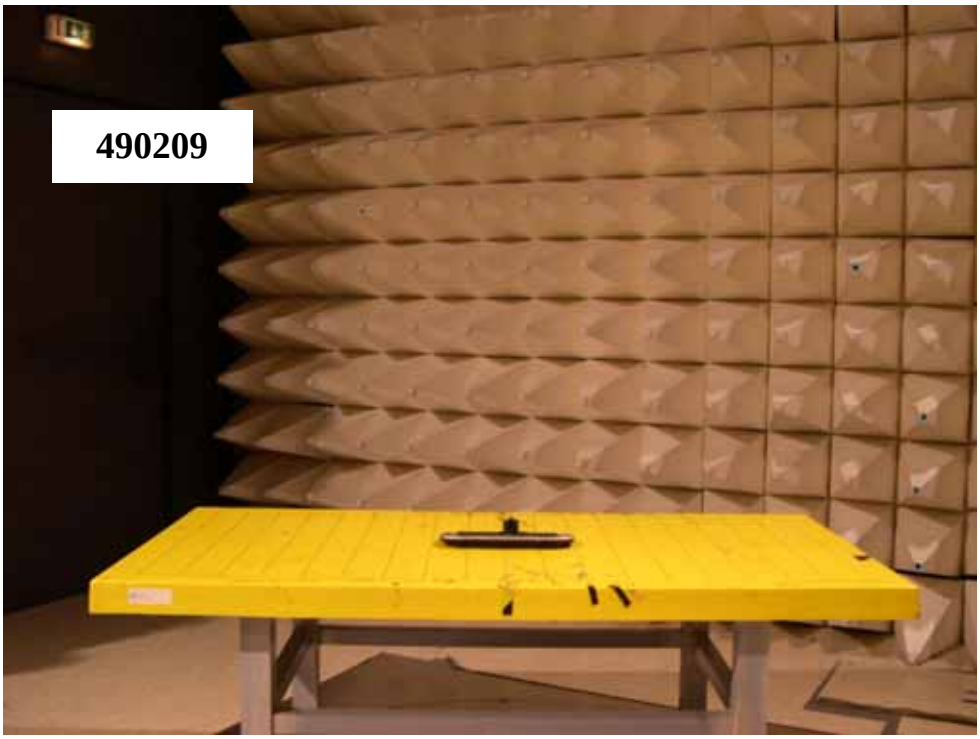

| | Freq | Level | Over Limit | Limit Line | Read Level | Probe Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | dB | | cm | deg |
| 1 | 269.600 | 17.94 | -28.06 | 46.00 | 29.52 | 12.89 | 2.95 | 27.42 | Peak | --- | --- |
| 2 | 794.400 | 24.99 | -21.01 | 46.00 | 26.86 | 21.83 | 5.09 | 28.79 | Peak | --- | --- |
| 3 | 896.800 | 27.82 | -18.18 | 46.00 | 29.09 | 21.71 | 5.33 | 28.31 | Peak | 131 | 146 |

## 8.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW


REAR VIEW



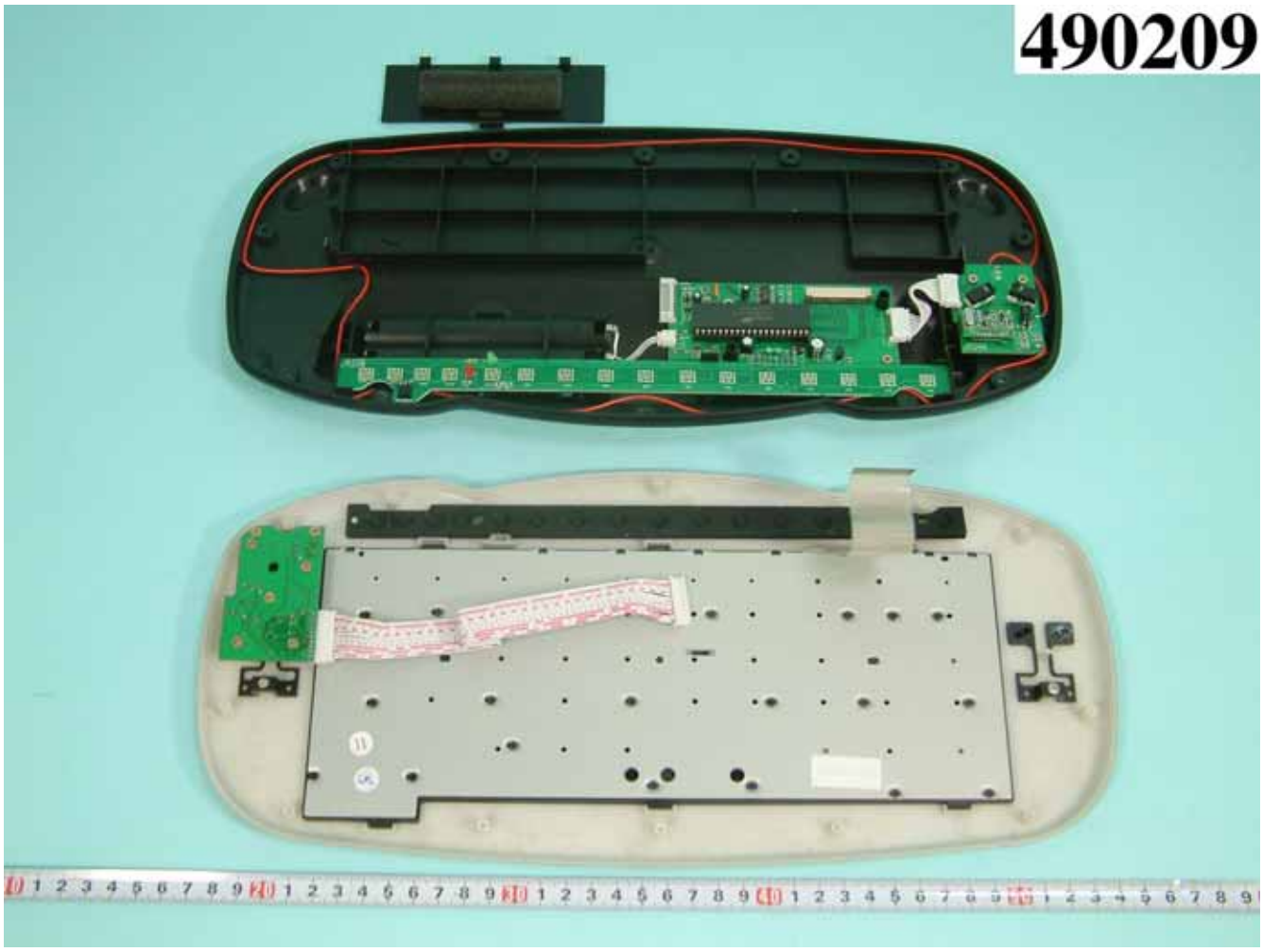
# 9. List of Measuring Equipments Used

| Items | Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 30MHz~1GHz 3m | Jun. 21, 2004 | Radiation (03CH03-HY) |
| 2 | Spectrum analyzer | R&S | FSP40 | 100004 | 9KHZ~40GHz | Aug. 22, 2004 | Radiation (03CH03-HY) |
| 3 | Amplifier | HP | 8447D | 2944A09072 | 100KHz – 1.3GHz | Nov. 05, 2003 | Radiation (03CH03-HY) |
| 4 | Biconical Antenna | SCHWARZBECK | VHBB 9124 | 301 | 30MHz –200MHz | Jul. 28, 2004 | Radiation (03CH03-HY) |
| 5 | Log Antenna | SCHWARZBECK | VUSLP 9111 | 221 | 200MHz -1GHz | Jul. 28, 2004 | Radiation (03CH03-HY) |
| 6 | RF Cable-R03m | Jye Bao | RG142 | CB021 | 30MHz~1GHz | Dec. 03, 2003 | Radiation (03CH03-HY) |
| 7 | Amplifier | MITEQ | AFS44 | 849984 | 100MHz~26.5GHz | Mar. 26, 2004 | Radiation (03CH03-HY) |
| 8 | Horn Antenna | EMCO | 3115 | 6821 | 1GHz – 18GHz | Sep. 11, 2004 | Radiation (03CH03-HY) |
| 9 | Turn Table | HD | DS 420 | 420/650/00 | 0 ~ 360 degree | N/A | Radiation (03CH03-HY) |
| 10 | Antenna Mast | HD | MA 240 | 240/560/00 | 1 m - 4 m | N/A | Radiation (03CH03-HY) |
| 11 | Horn Antenna | Schwarzbeck | BBHA9170 | 154 | 15GHz~40GHz | Jun. 09, 2004 | Radiation (03CH03-HY) |
| 12 | RF Cable-HIGH | Jye Bao | RG142 | CB030-HIGH | 1GHz~29.5GHz | Dec. 05, 2003 | Radiation (03CH03-HY) |

※ Calibration Interval of instruments listed above is one year.

# APPENDIX A. Photographs of EUT


***SPORTON International Inc.***
TEL : 886-2-2696-2468
FAX : 886-2-2696-2255

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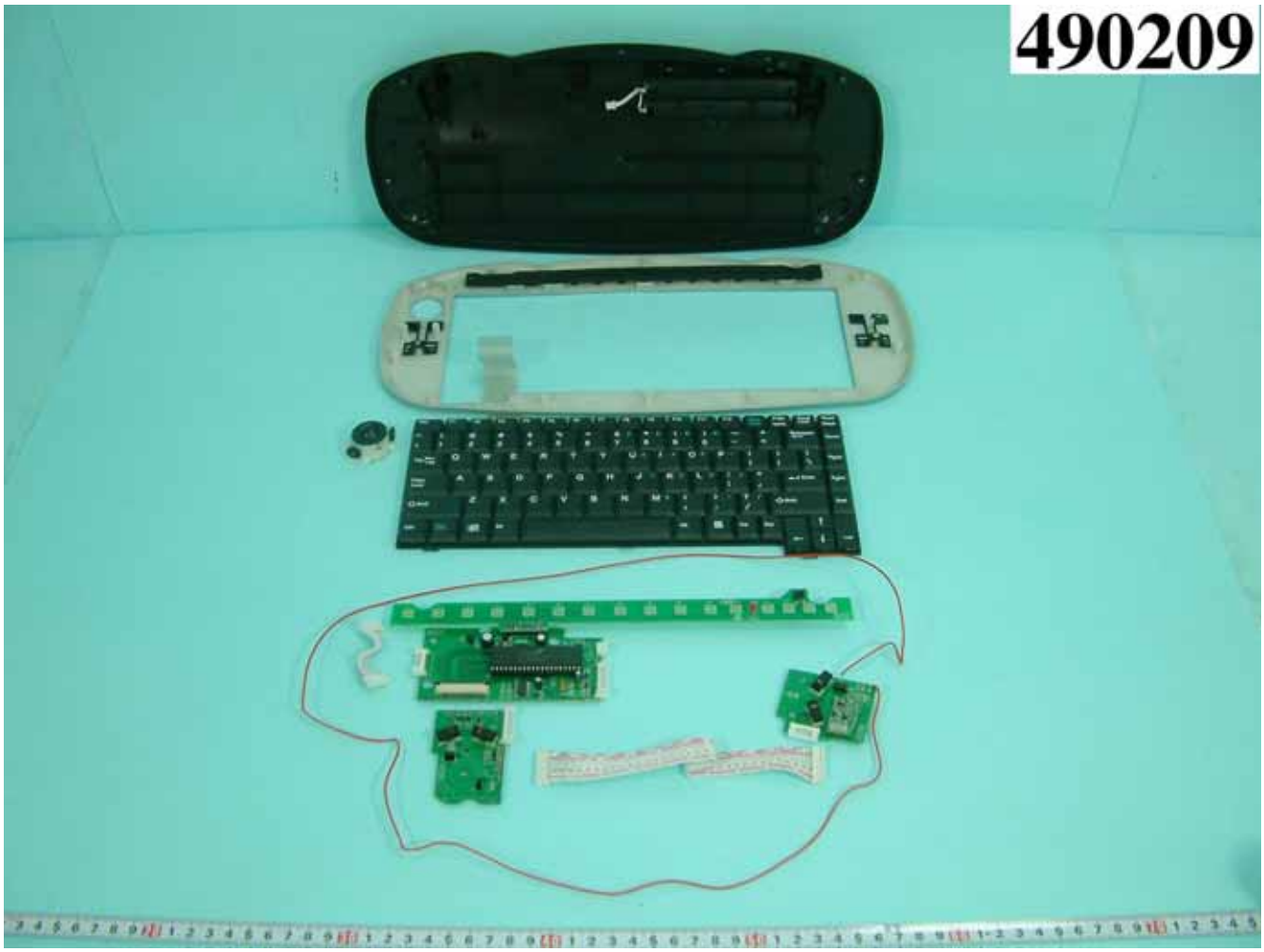


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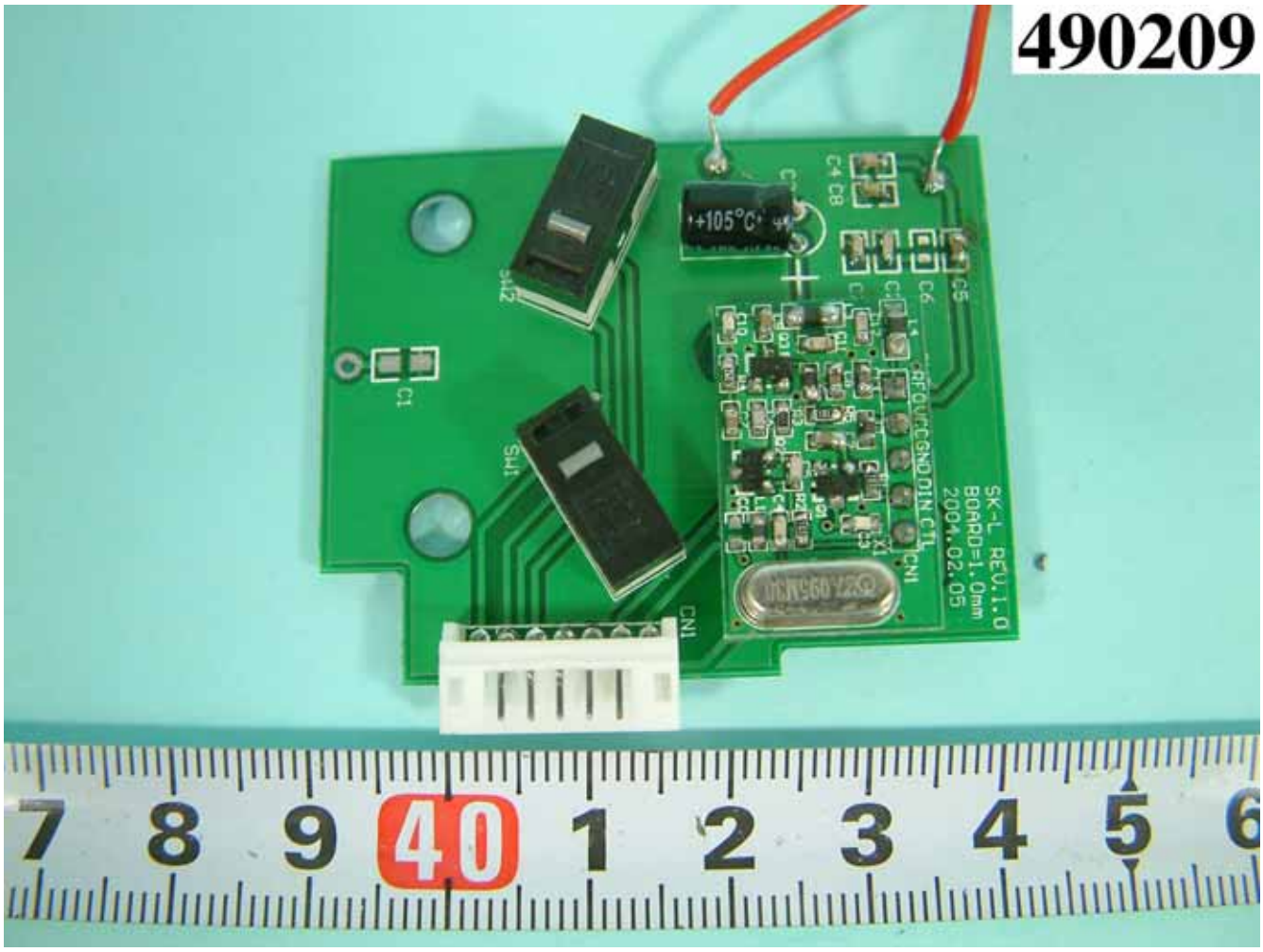


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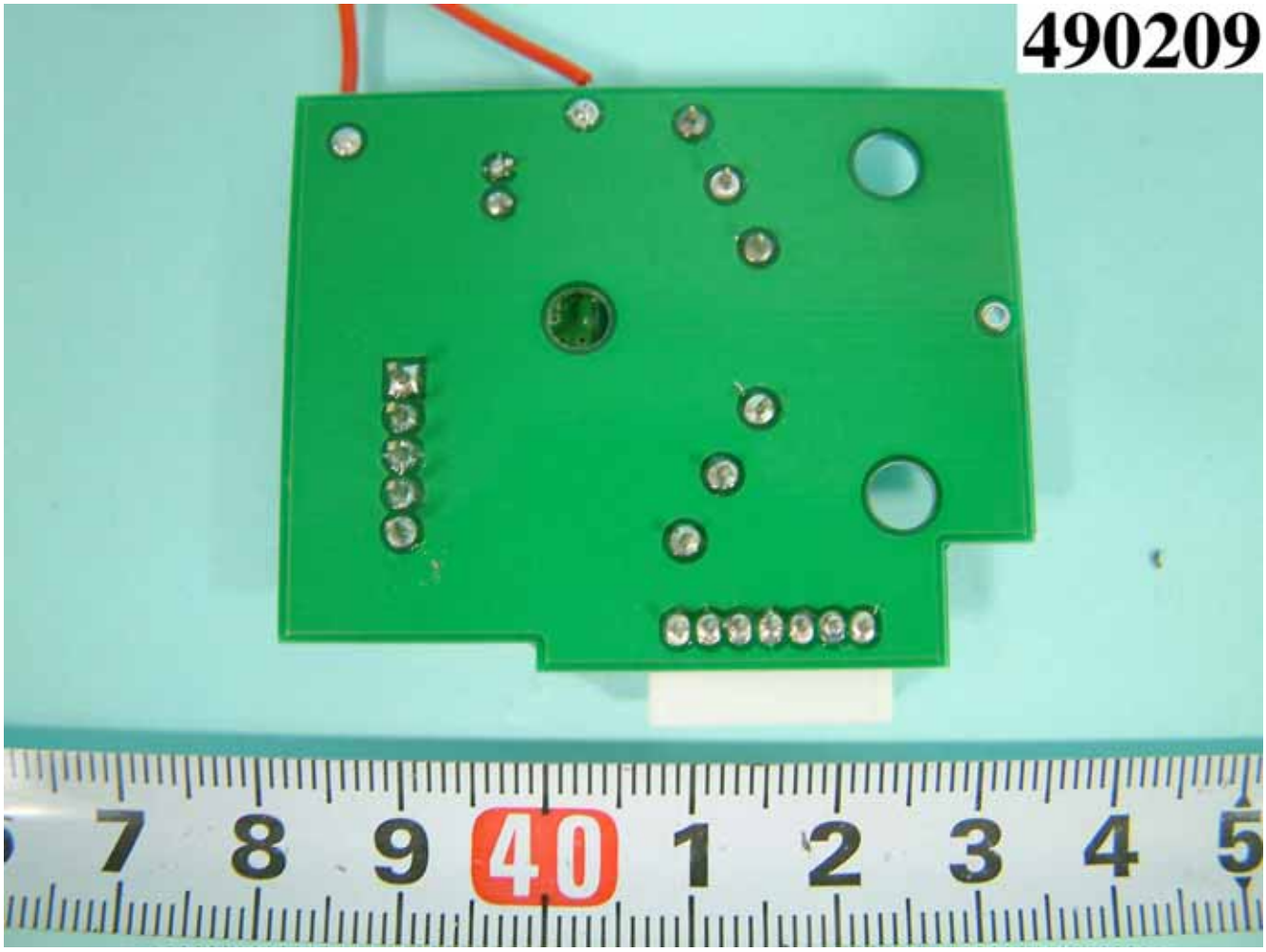
FAX : 886-2-2696-2255

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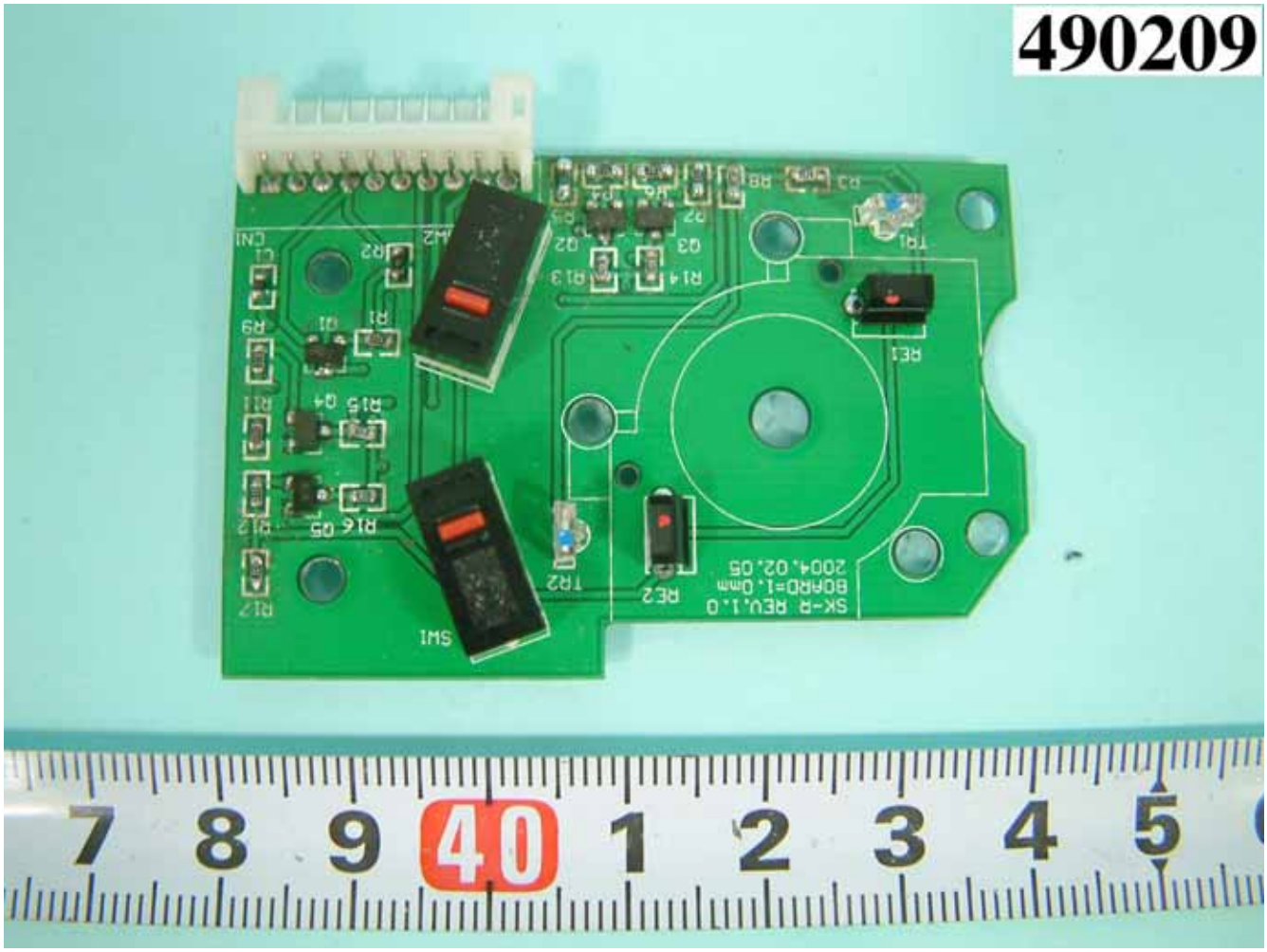
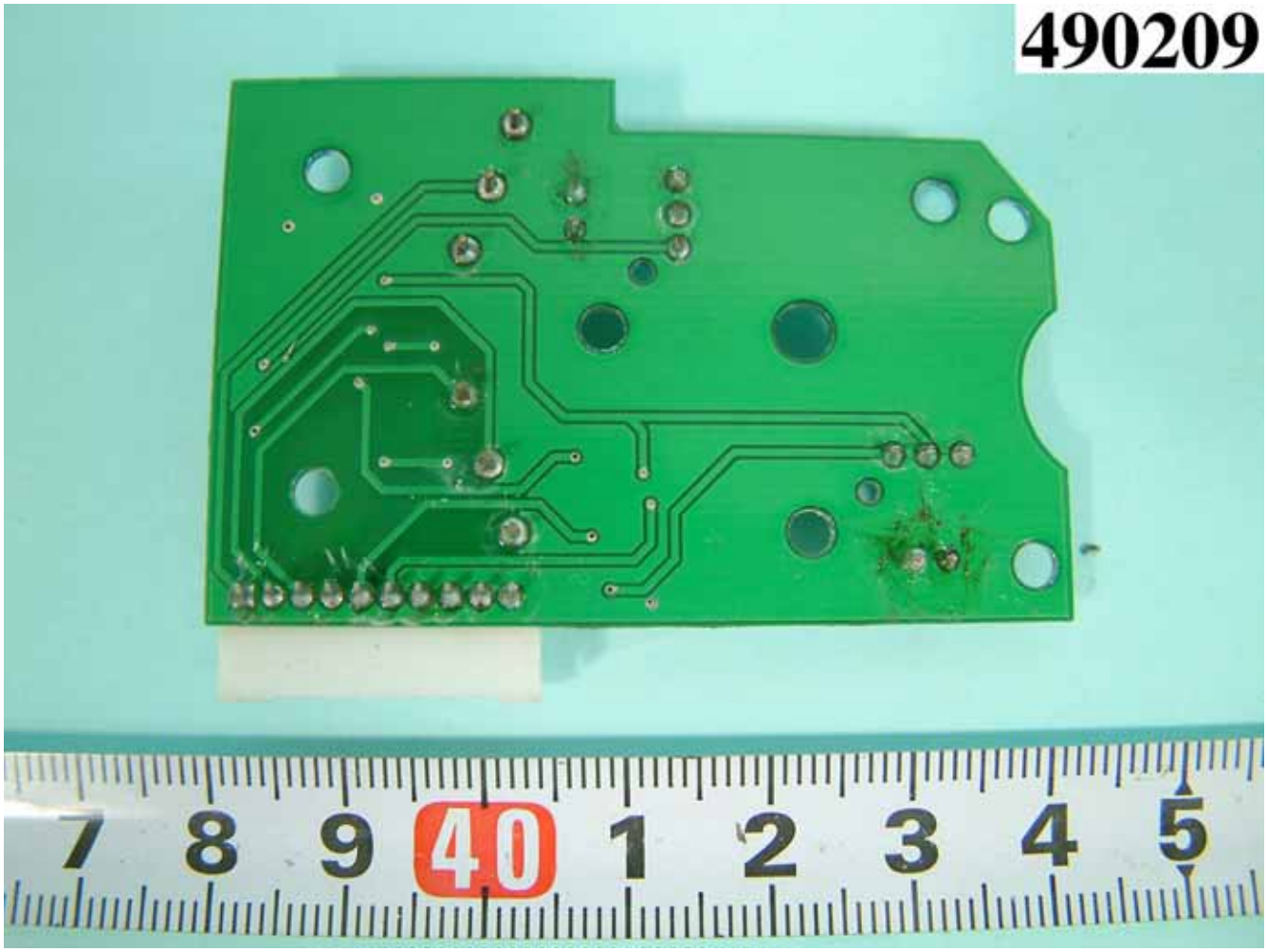

490209
SK-R REV.1.0
BOARD=1.0mm
2004.02.05

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TEL : 886-2-2696-2468
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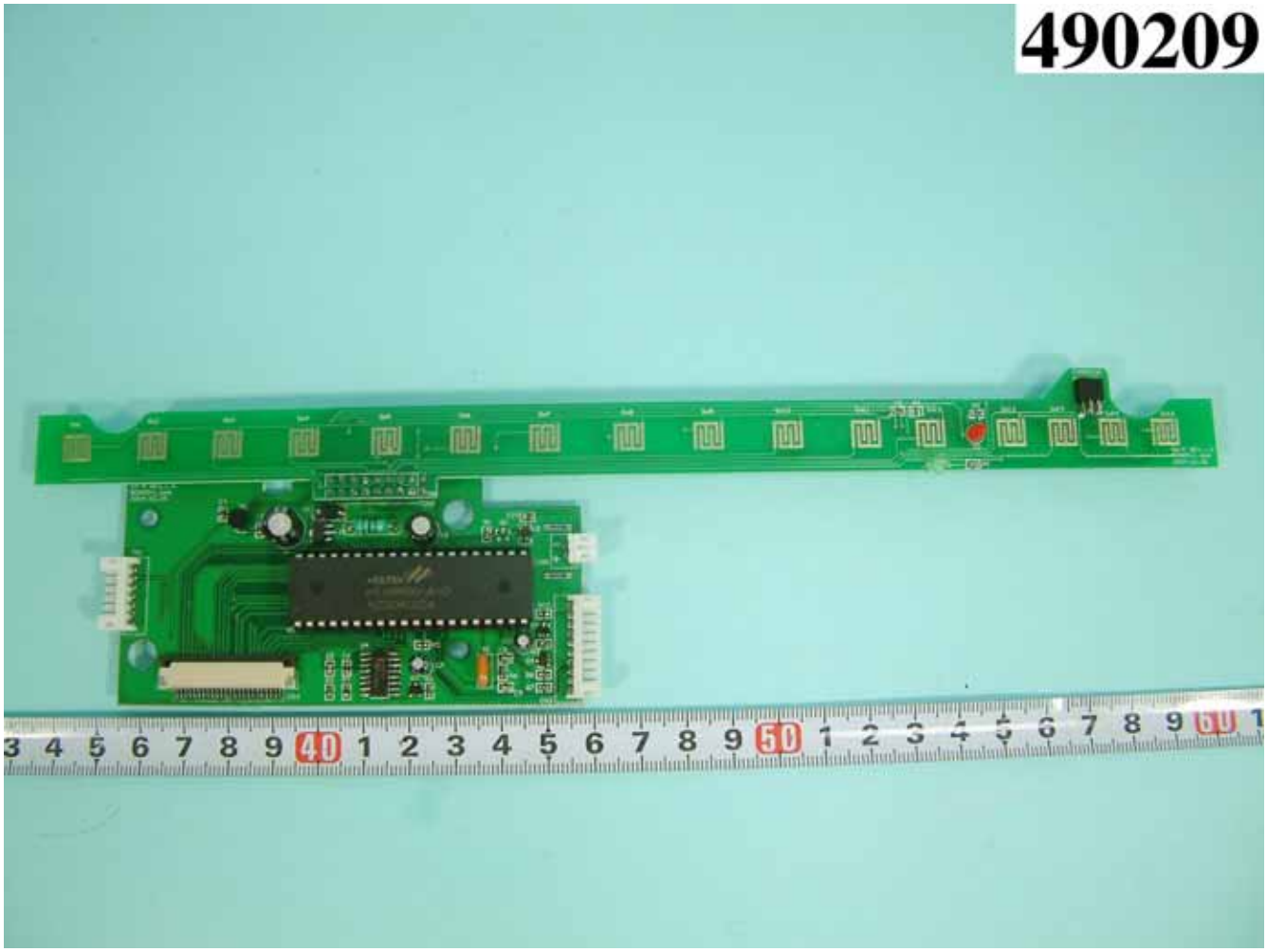


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TEL : 886-2-2696-2468
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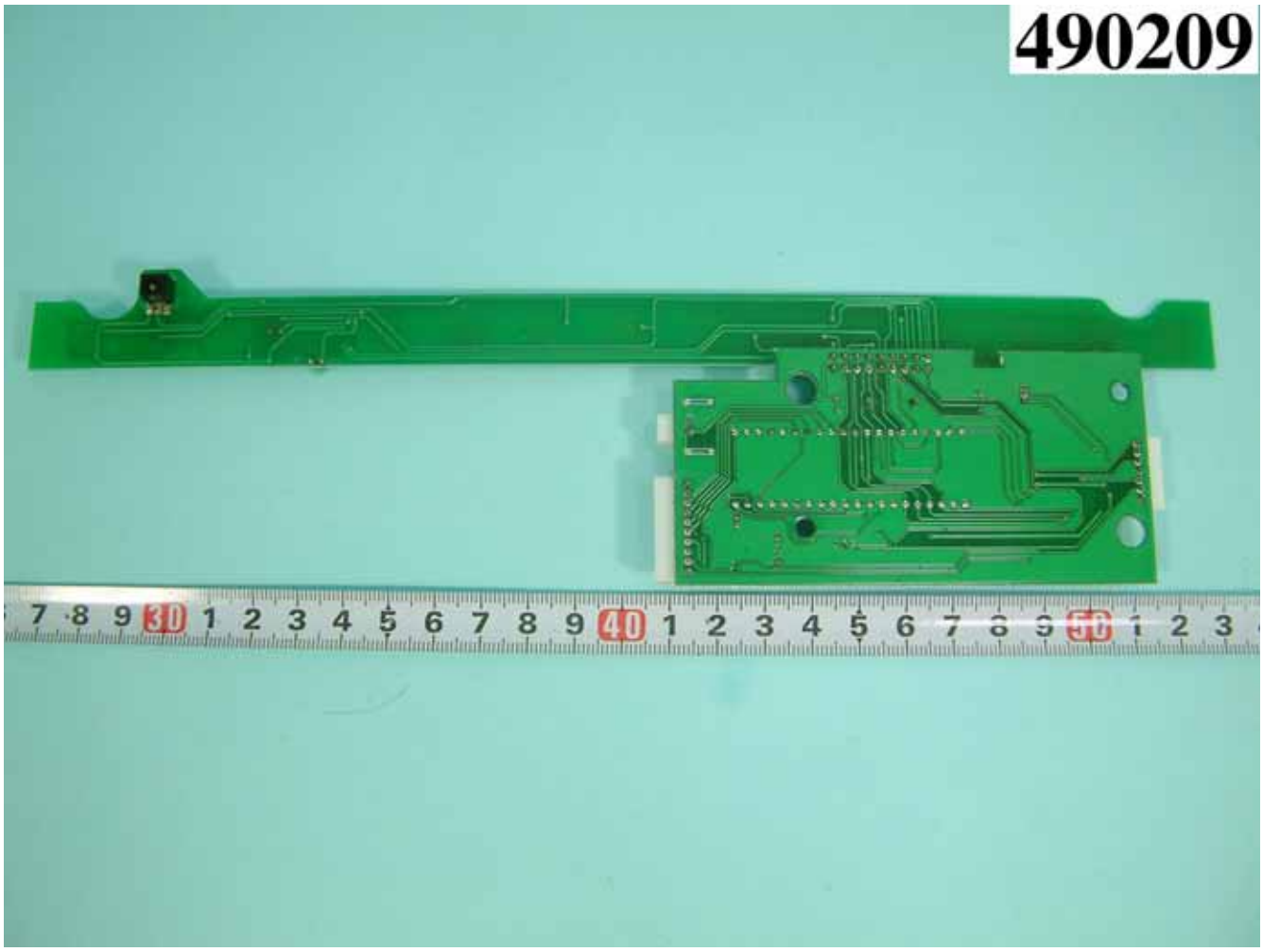


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TEL : 886-2-2696-2468
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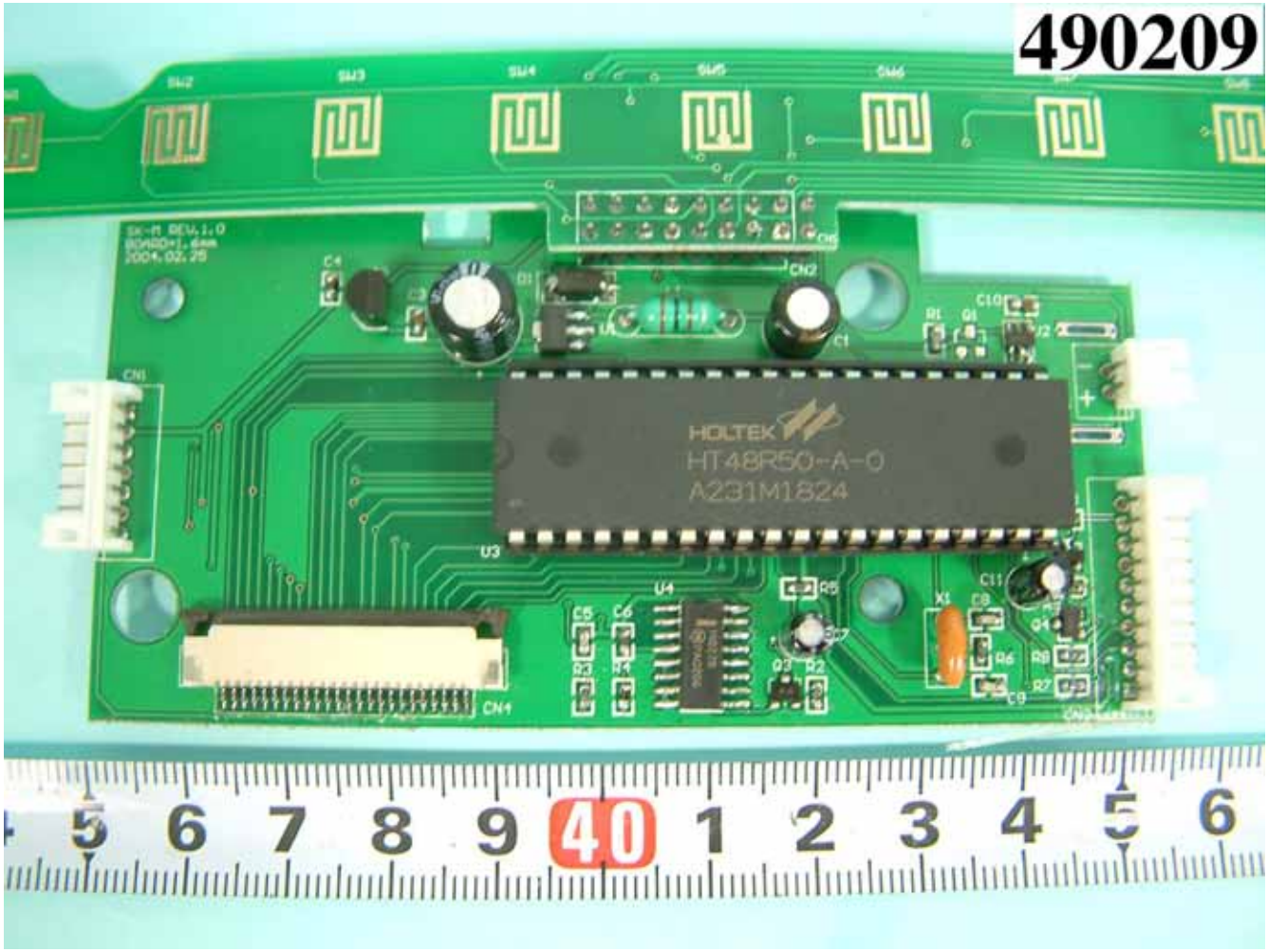
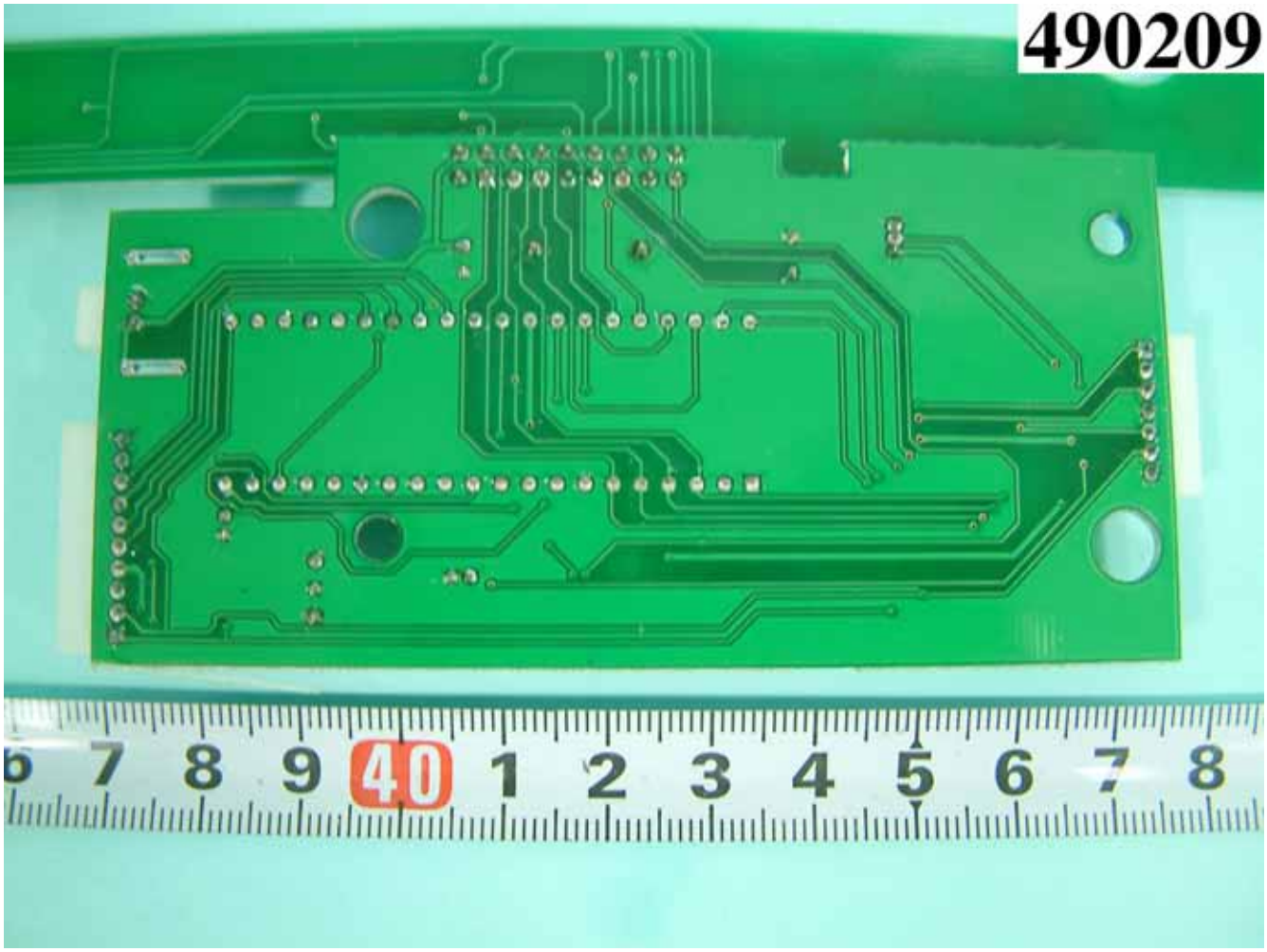

490209
HOLTEK
HT48R50-A-0
A231M1824
U3
U4
CN1
CN4

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