FCC TEST REPORT

CATEGORY	:	Portable
PRODUCT NAME	:	RF KEYBOARD & MOUSE
FCC ID.	:	P4PRF620MS
FILING TYPE	:	Certification
BRAND NAME	:	ZIPPY
MODEL NAME	:	RF620
APPLICANT	:	**ZIPPY TECHNOLOGY CORP.** 10F, NO. 50 MIN CHYUAN RD. SHIN, TIEN CITY, TAIPEI HSIEN, TAIWAN, R.O.C.
MANUFACTURER	:	Same as applicant
ISSUED BY	:	**SPORTON INTERNATIONAL INC.** 6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien, Taiwan, R.O.C.

Statements:

This test report is for the Mouse only.

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
Sporton International Inc.

1190
ILAC MRA

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HISTORY OF THIS TEST REPORT

Original Report Issue Date: Dec. 28, 2004

Report No.: FR4O0419

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

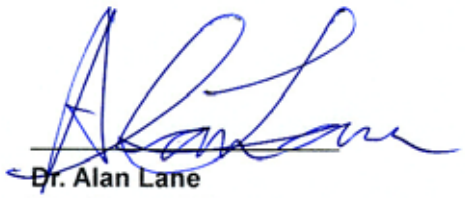
with

47 CFR FCC Part 15 Subpart C (Section 15.249)

PRODUCT NAME	:	RF KEYBOARD & MOUSE
BRAND NAME	:	ZIPPY
MODEL NAME	:	RF620
APPLICANT	:	**ZIPPY TECHNOLOGY CORP.** 10F, NO. 50 MIN CHYUAN RD. SHIN, TIEN CITY, TAIPEI HSIEN, TAIWAN, R.O.C.
MANUFACTURER	:	Same as applicant

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 - 2003 and all test are performed according to 47 CFR FCC Part 15. Testing was carried out on Oct. 20, 2004 at SPORTON International Inc. LAB.



Dr. Alan Lane
Vice General Manager
Sporton International Inc.

1. General Description of Equipment under Test

1.1. Applicant

ZIPPY TECHNOLOGY CORP.
10F, NO. 50 MIN CHYUAN RD. SHIN, TIEN CITY, TAIPEI HSIEN, TAIWAN, R.O.C.

1.2. Manufacturer

Same as applicant

1.3. Basic Description of Equipment under Test

This product is a wireless KB/ Mouse and receiver with GFSK modulation solution. The receiver is used to be plugged on the USB port of the computer. This report is for the mouse part only. Please refer to “Features of Equipment under Test”.

1.4. Features of Equipment under Test

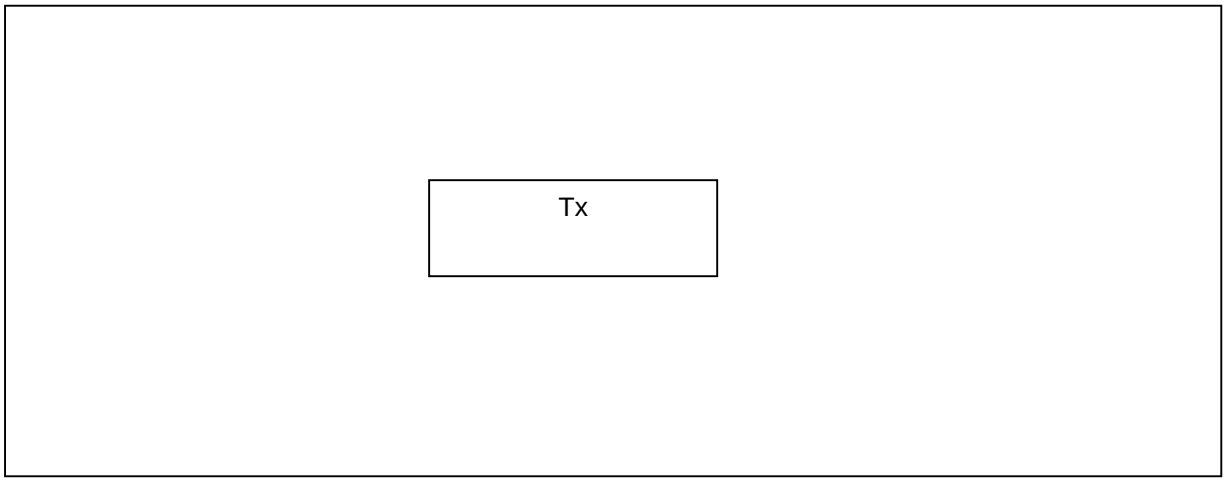
Items	Description
Type of Modulation	GFSK
Number of Channels	16
Frequency Band	2403MHz ~ 2476MHz
Carrier Frequency	See section 1.5 for details
Channel Bandwidth	1MHz
Antenna Type	Printed Antenna
Communication Type	Simplex
Testing Duty Cycle	100.00%
Power Rating (DC/AC, Voltage)	KB: 3.0 VDC from battery MOUSE: 3.0 VDC from battery
Test Power Source	3.00V DC
Temperature Range (Operating)	0 ~ 55 °C

1.5. Table for Carrier Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2409 MHz	5	2430 MHz	9	2450 MHz	13	2469MHz
2	2415 MHz	6	2435 MHz	10	2455 MHz	14	2472 MHz
3	2420 MHz	7	2440 MHz	11	2460 MHz	15	2474 MHz
4	2425 MHz	8	2445 MHz	12	2465 MHz	16	2476 MHz

2. Test Configuration of the Equipment under Test

2.1. Connection Diagram of Test System



2.2. The Test Mode Description

Spurious emission below 1GHz is independent of channel selection, so only channel 16 was tested.
AC conduction emission is independent of channel selection, so only channel 16 was tested.
The test report is for mouse only.

2.3. Description of Test Supporting Units

Support unit	Brand	Model No.	Serial No.	FCC ID	Data cable (m)
Notebook	COMPAQ	PRESARIO 1500	SP0004	DoC	-
Printer	EPSON	Stylus Color 680	SP0016	DoC	1.35

3. General Information of Test

3.1. Test Facility

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
	:	TEL 886-3-327-3456
	:	FAX 886-3-318-0055
Test Site No	:	03CH01-HY / TH01-HY

3.2. Test Conditions

Normal Voltage	:	3.00V
Normal Temperature	:	20°C

3.3. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.
ANSI C63.4-2003
47 CFR Part 15 Subpart C (Section 15.249)

3.4. DoC Statement

This EUT is also classified as a device of computer peripheral Class B which DoC has to be followed. It has been verified according to the rule of 47 CFR part 15 Subpart B, and found that all the requirements has been fulfilled.

3.5. Frequency Range Investigated

Radiated emission test: from 30 MHz to 10th carrier harmonic

3.6. Test Distance

The test distance of radiated emission (30MHz~1GHz) test from antenna to EUT is 3 M.
The test distance of radiated emission (1GHz~10th carrier harmonic) test from antenna to EUT is 3 M.

3.7. Test Software

There is no test software for the test.

4. List of Measurements

4.1. Summary of the Test Results

Applied Standard: 47 CFR Part 15 and Part 2			
Paragraph	**FCC Rule**	**Description of Test**	**Result**
5.1	15.249	Maximum Carrier Field Strength	Pass
5.2	15.207	AC Power Line Conducted Emission	Pass
5.3	15.209/15.249	Spurious Radiated Emission	Pass
5.4	15.203	Antenna Requirement	Pass

5. Test Result

5.1. Test of Maximum Carrier Field Strength

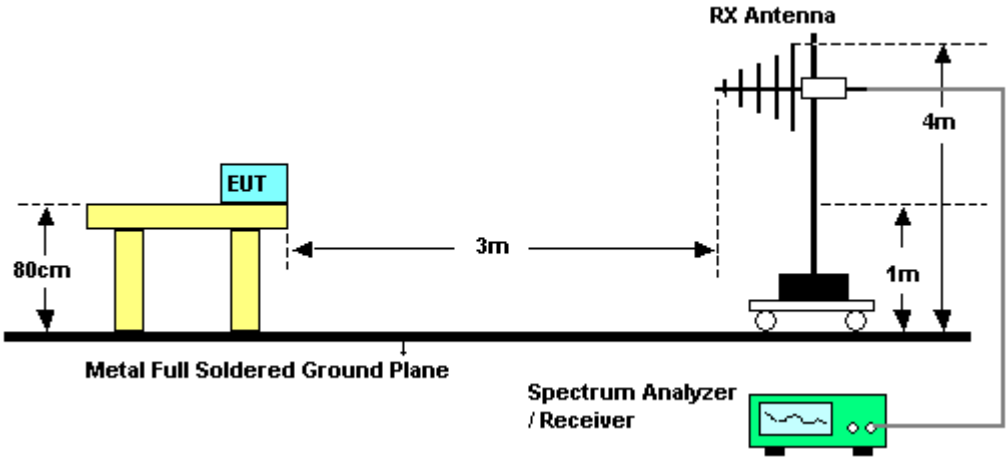
5.1.1. Measuring Instruments

Item 6~17 of the table is on section 6.

5.1.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
3. 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.
4. For carrier field strength 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.
5. For carrier field strength emission, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

5.1.3. Test Setup Layout



5.1.4. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

Channel No.	Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV/m)	Detector
1	2409 MHz	65.09	-28.91	94.00	35.02	Average
1	2409 MHz	82.32	-31.68	114.00	52.25	Peak
8	2445 MHz	82.66	-11.34	94.00	35.18	Average
8	2445 MHz	65.36	-48.64	114.00	52.48	Peak
16	2476 MHz	65.99	-28.01	94.00	35.73	Average
16	2476 MHz	83.83	-30.17	114.00	53.57	Peak

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

5.2. Test of AC Power Line Conducted Emission

The EUT is battery powered, so it is not required to test this item.

5.3. Test of Spurious Radiated Emission

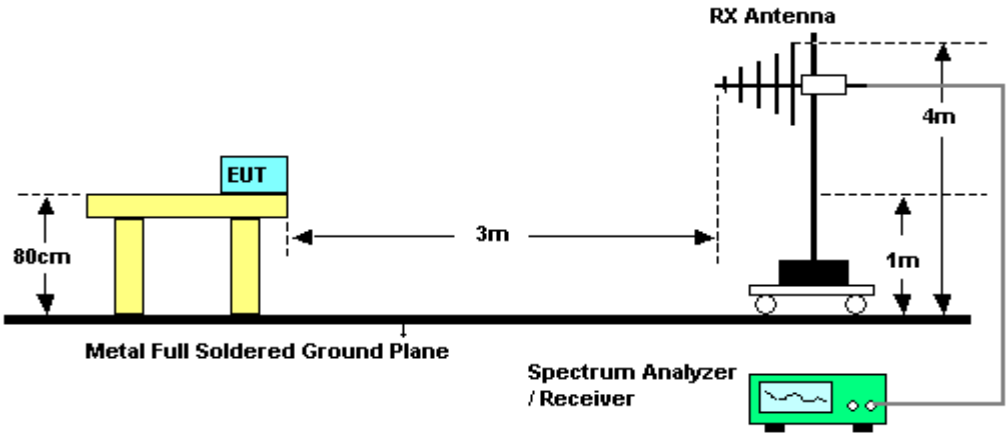
5.3.1. Measuring Instruments

Please reference item 6~17 in chapter 6 for the instruments used for testing.

5.3.2. 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 by 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. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. If the emission level of the EUT in peak mode was 3 dB lower than the average 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 for below 1GHz and average method for above the 1GHz. the reported.
11. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.3.3. Test Setup Layout



5.3.4. Test Results for CH 16 / 2476 MHz (for emission below 1GHz)

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steve Chen

(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	46.830	26.25	-13.75	40.00	41.08	12.02	1.16	28.01	Peak	172	185
2	109.390	28.88	-14.62	43.50	44.55	10.35	1.86	27.88	Peak	---	---
3	128.260	28.12	-15.38	43.50	41.60	12.29	2.07	27.84	Peak	---	---
1	790.400	27.07	-18.93	46.00	29.03	21.78	5.05	28.79	Peak	---	---
2	896.800	28.68	-17.32	46.00	29.95	21.71	5.33	28.31	Peak	---	---
3	938.400	29.77	-16.23	46.00	30.03	22.55	5.45	28.26	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	52.950	22.89	-17.11	40.00	38.52	11.13	1.23	27.99	Peak	---	---
2	90.860	22.35	-21.15	43.50	40.10	8.54	1.63	27.92	Peak	---	---
3	182.490	26.10	-17.40	43.50	36.99	14.40	2.44	27.73	Peak	---	---

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

5.3.5. Test Results for CH 1 / 2409 MHz (for emission above 1GHz)

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steve Chen

(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	2356.000	48.03	-25.97	74.00	57.75	28.20	1.69	39.61	Peak	---	---
2	4820.000	59.54	-14.46	74.00	64.32	32.96	2.40	40.14	Peak	---	---
3	4820.000	47.65	-6.35	54.00	52.43	32.96	2.40	40.14	Average	---	---
4	7228.000	56.90	-17.10	74.00	57.71	35.82	2.84	39.47	Peak	---	---
5	7228.000	45.25	-8.75	54.00	46.06	35.82	2.84	39.47	Average	---	---

(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	2356.000	51.56	-22.44	74.00	61.29	28.16	1.72	39.61	Peak	---	---
2	2748.000	45.50	-28.50	74.00	53.73	29.30	1.96	39.49	Peak	---	---
3	4820.000	58.33	-15.67	74.00	63.11	32.96	2.40	40.14	Peak	---	---
4	4820.000	45.37	-8.63	54.00	50.15	32.96	2.40	40.14	Average	---	---
5	7224.000	65.75	-8.25	74.00	66.74	35.77	2.72	39.48	Peak	---	---
6	7224.000	51.00	-3.00	54.00	51.99	35.77	2.72	39.48	Average	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.6. Test Results for CH 8 / 2445 MHz (for emission above 1GHz)

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steve Chen

(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	1220.000	40.19	-33.81	74.00	53.58	24.60	1.22	39.21	Peak	---	---
2	2356.000	48.00	-26.00	74.00	57.73	28.16	1.72	39.61	Peak	---	---
3	4892.000	61.56	-12.44	74.00	66.08	33.11	2.51	40.14	Peak	---	---
4	4892.000	46.72	-27.28	74.00	51.24	33.11	2.51	40.14	Average	---	---
5	7336.000	45.80	-28.20	74.00	46.15	36.13	2.97	39.45	Average	---	---
6	7336.000	58.53	-15.47	74.00	58.88	36.13	2.97	39.45	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	2356.000	49.91	-24.09	74.00	59.64	28.16	1.72	39.61	Peak	---	---
2	2744.000	46.32	-27.68	74.00	54.55	29.30	1.96	39.49	Peak	---	---
3	4892.000	45.08	-8.92	54.00	49.60	33.11	2.51	40.14	Average	---	---
4	4892.000	58.46	-15.54	74.00	62.98	33.11	2.51	40.14	Peak	---	---
5	7336.000	50.19	-3.81	54.00	50.54	36.13	2.97	39.45	Average	---	---
6	7336.000	65.29	-8.71	74.00	65.64	36.13	2.97	39.45	Peak	---	---

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

5.3.7. Test Results for CH 16 / 2476 MHz (for emission above 1GHz)

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Steve Chen

(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	2528.000	50.42	-23.58	74.00	59.52	28.61	1.86	39.57	Peak	---	---
2	2596.000	47.93	-26.07	74.00	56.81	28.77	1.90	39.55	Peak	---	---
3	4956.000	58.63	-15.37	74.00	63.10	33.24	2.44	40.15	Peak	---	---
4	4956.000	45.13	-8.87	54.00	49.60	33.24	2.44	40.15	Average	---	---
5	7428.000	57.91	-16.09	74.00	58.04	36.39	2.90	39.42	Peak	---	---
6	7428.000	45.68	-28.32	74.00	45.81	36.39	2.90	39.42	Peak	---	---

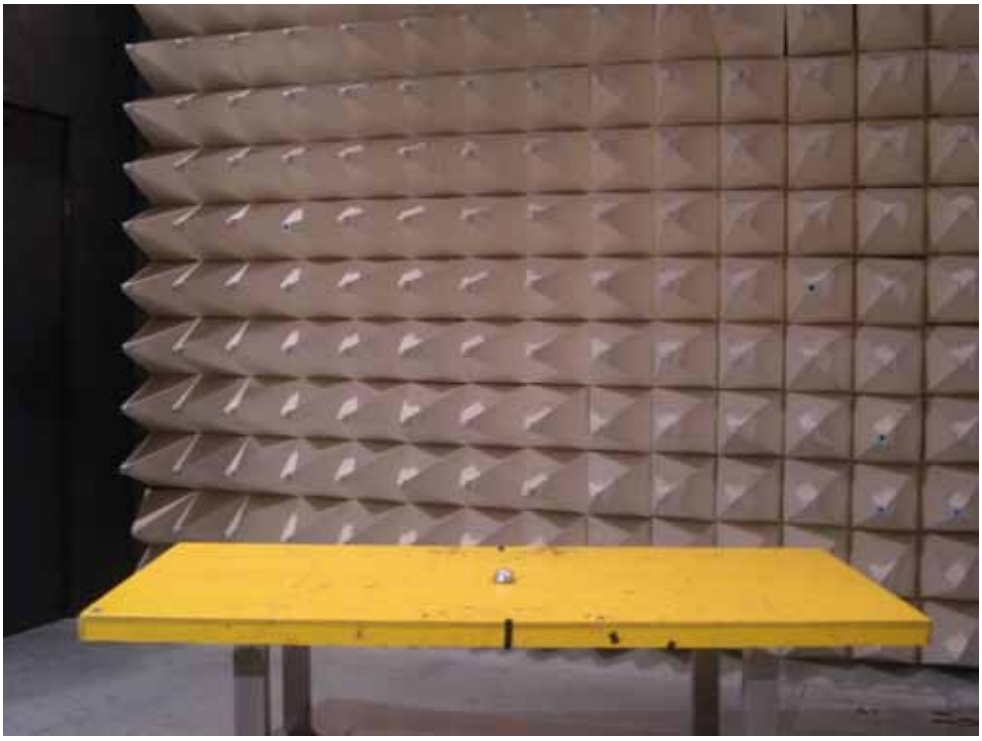
(B) Polarization: Vertical

	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	2528.000	47.29	-26.71	74.00	56.39	28.61	1.86	39.57	Peak	---	---
2	2744.000	44.42	-29.58	74.00	52.65	29.30	1.96	39.49	Peak	---	---
3	4956.000	60.03	-13.97	74.00	64.50	33.24	2.44	40.15	Peak	---	---
4	4956.000	46.23	-7.77	54.00	50.70	33.24	2.44	40.15	Average	---	---
5	7428.000	62.26	-11.74	74.00	62.39	36.39	2.90	39.42	Peak	---	---
6	7428.000	49.28	-4.72	54.00	49.41	36.39	2.90	39.42	Average	---	---

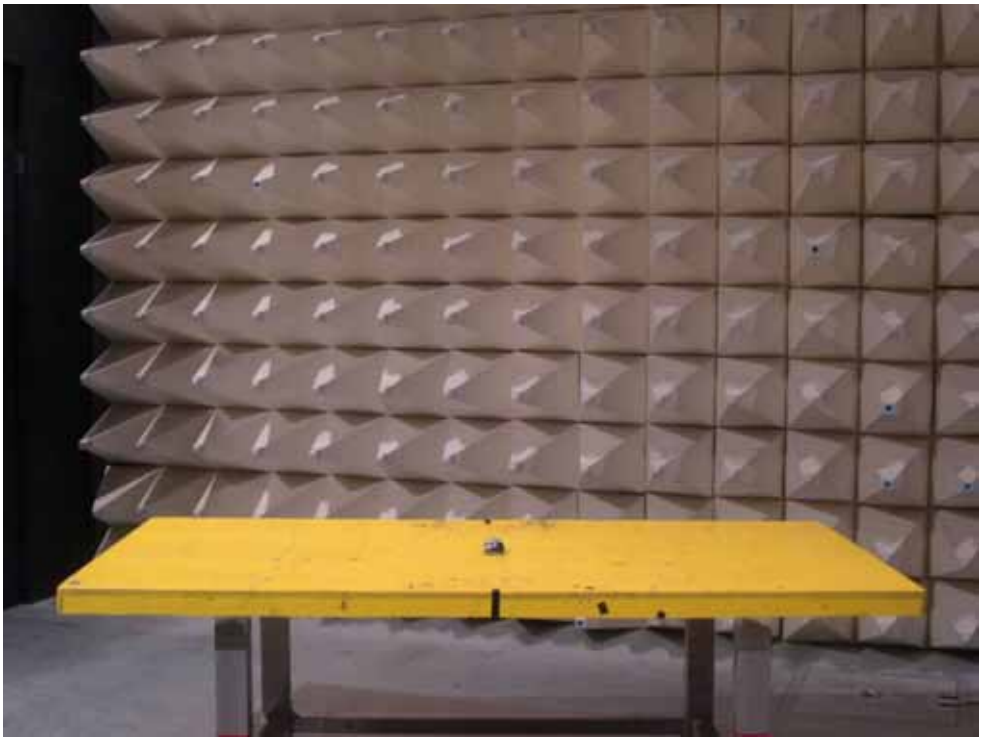
Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.8. Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW



5.4. Antenna Requirements

5.4.1. Standard Applicable

Section 15.203:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

5.4.2. Antenna Connected Construction

There is no antenna connector for printed antenna.

6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	EMC Receiver	R&S	ESCS 30	100174	9 KHz – 2.75 GHz	Feb. 16, 2004	Conduction (CO04-HY)
2	LISN	MessTec	NNB-2/16Z	2001/004	9 KHz – 30 MHz	Jun. 09, 2004	Conduction (CO04-HY)
3	LISN (Support Unit)	MessTec	NNB-2/16Z	99041	9 KHz – 30 MHz	Apr. 27, 2004	Conduction (CO04-HY)
4	EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
5	RF Cable-CON	UTIFLEX	3102-26886-4	CB044	9KHz~30MHz	Apr. 21, 2004	Conduction (CO04-HY)
6	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
7	Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 31, 2004	Radiation (03CH03-HY)
8	Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 2003	Radiation (03CH03-HY)
9	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 28, 2004	Radiation (03CH03-HY)
10	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 28, 2004	Radiation (03CH03-HY)
11	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
12	Amplifier	MITEQ	AFS44	849984	100MHz~26.5GHz	Mar. 26, 2004	Radiation (03CH03-HY)
13	Horn Antenna	EMCO	3115	6741	1GHz – 18GHz	Apr. 07, 2004	Radiation (03CH03-HY)
14	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
15	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
16	Horn Antenna	Schwarzbeck	BBHA9170	154	18GHz~40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
17	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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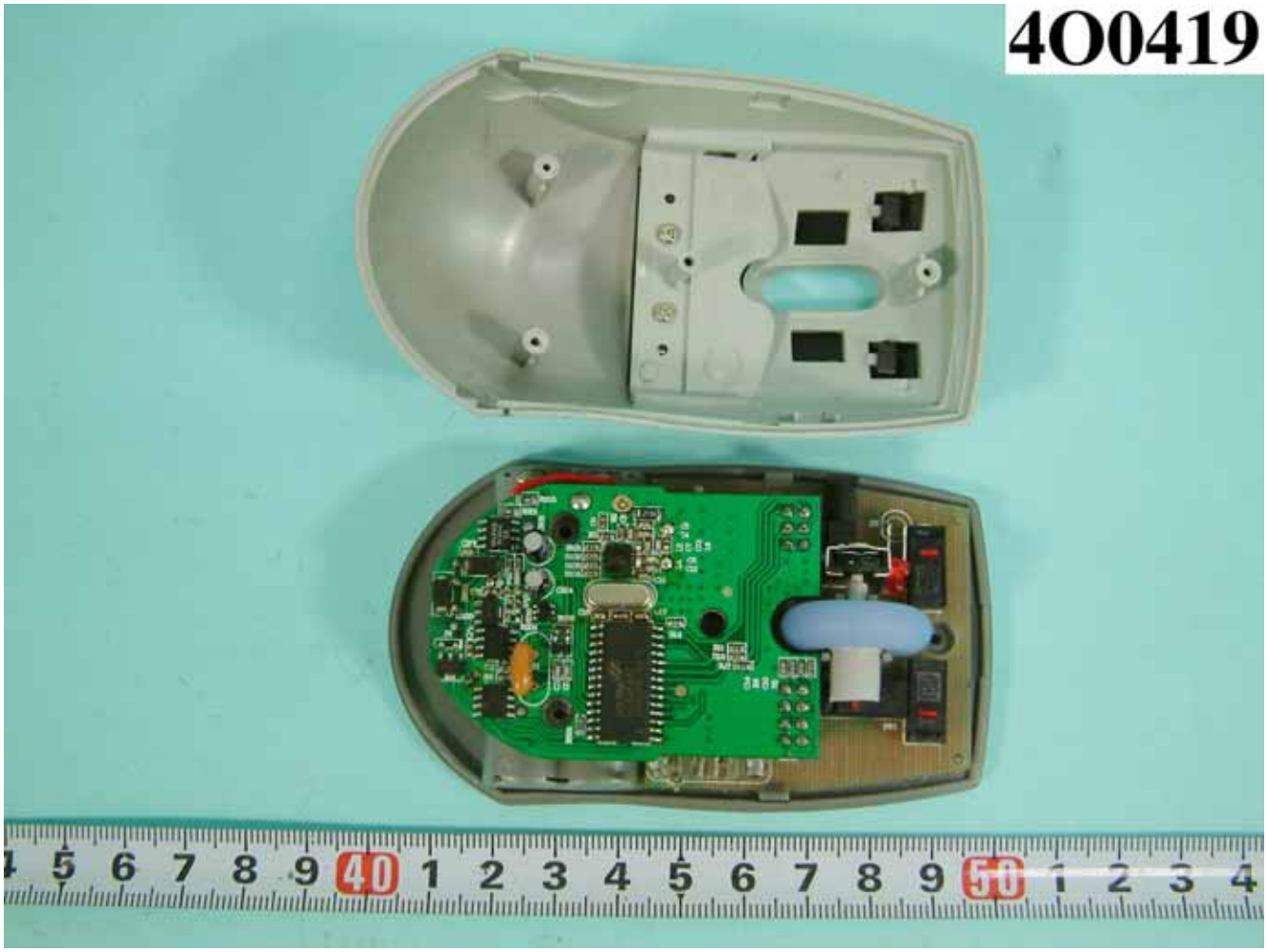

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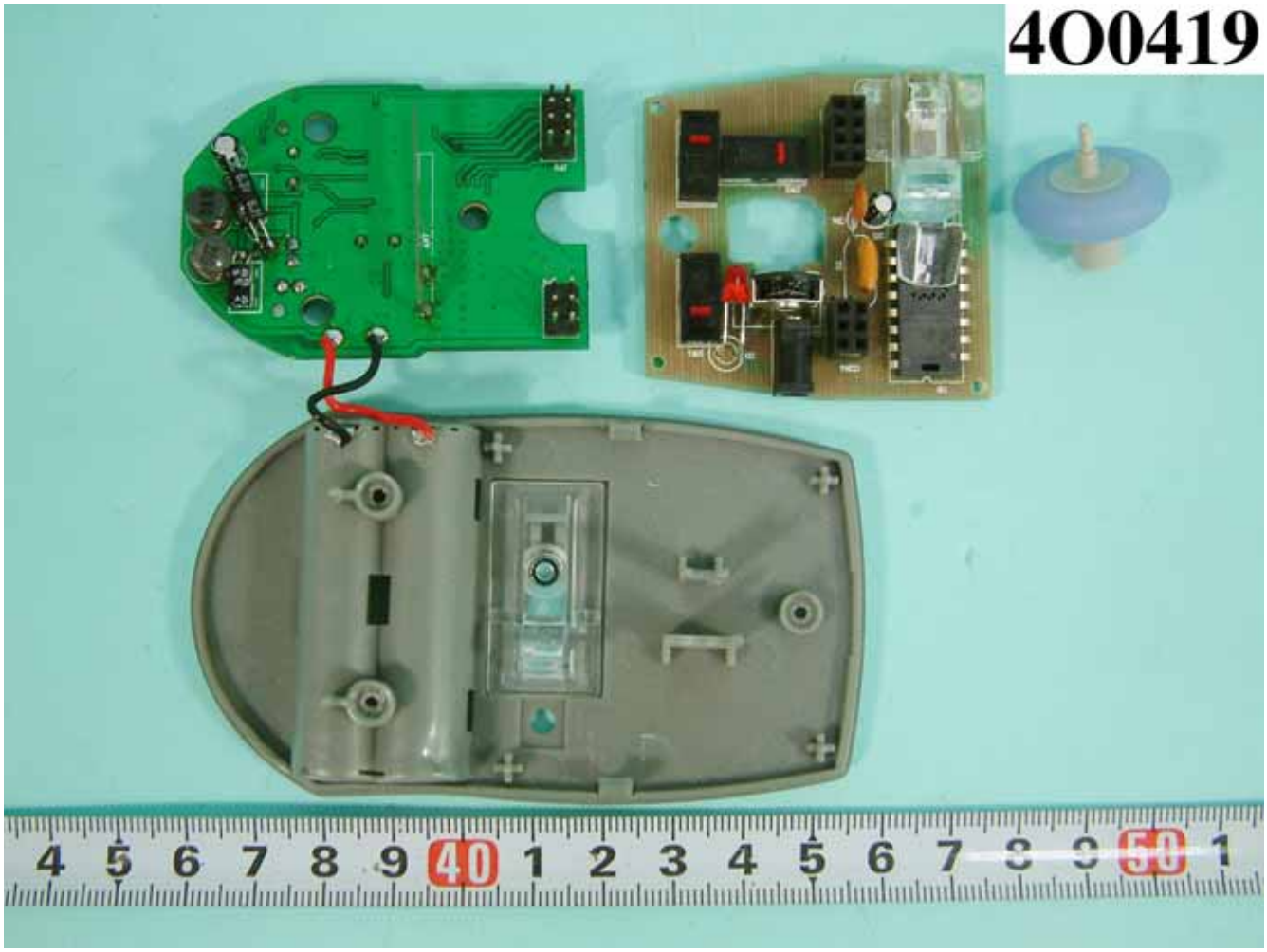

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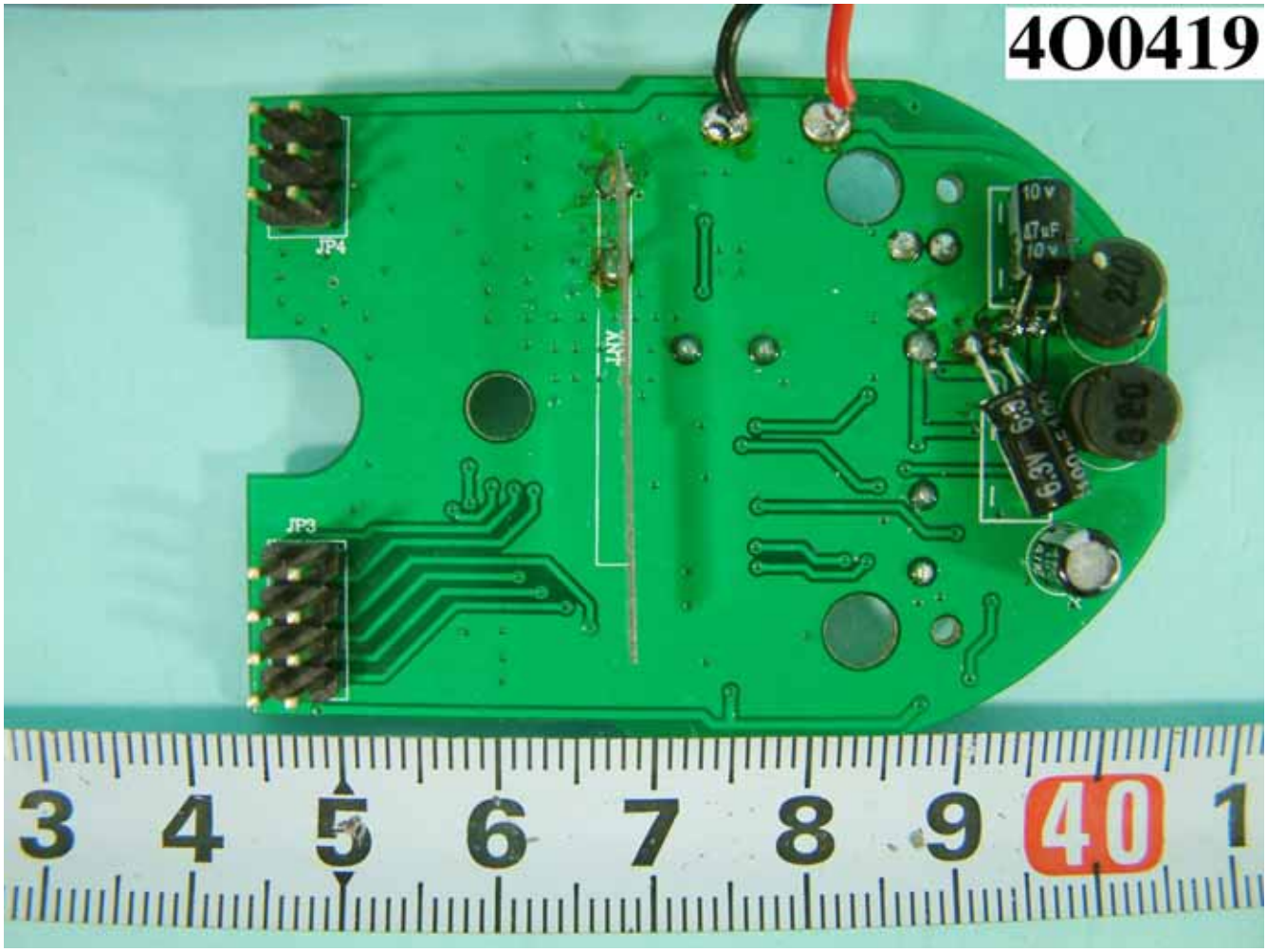
FAX : 886-2-2696-2255



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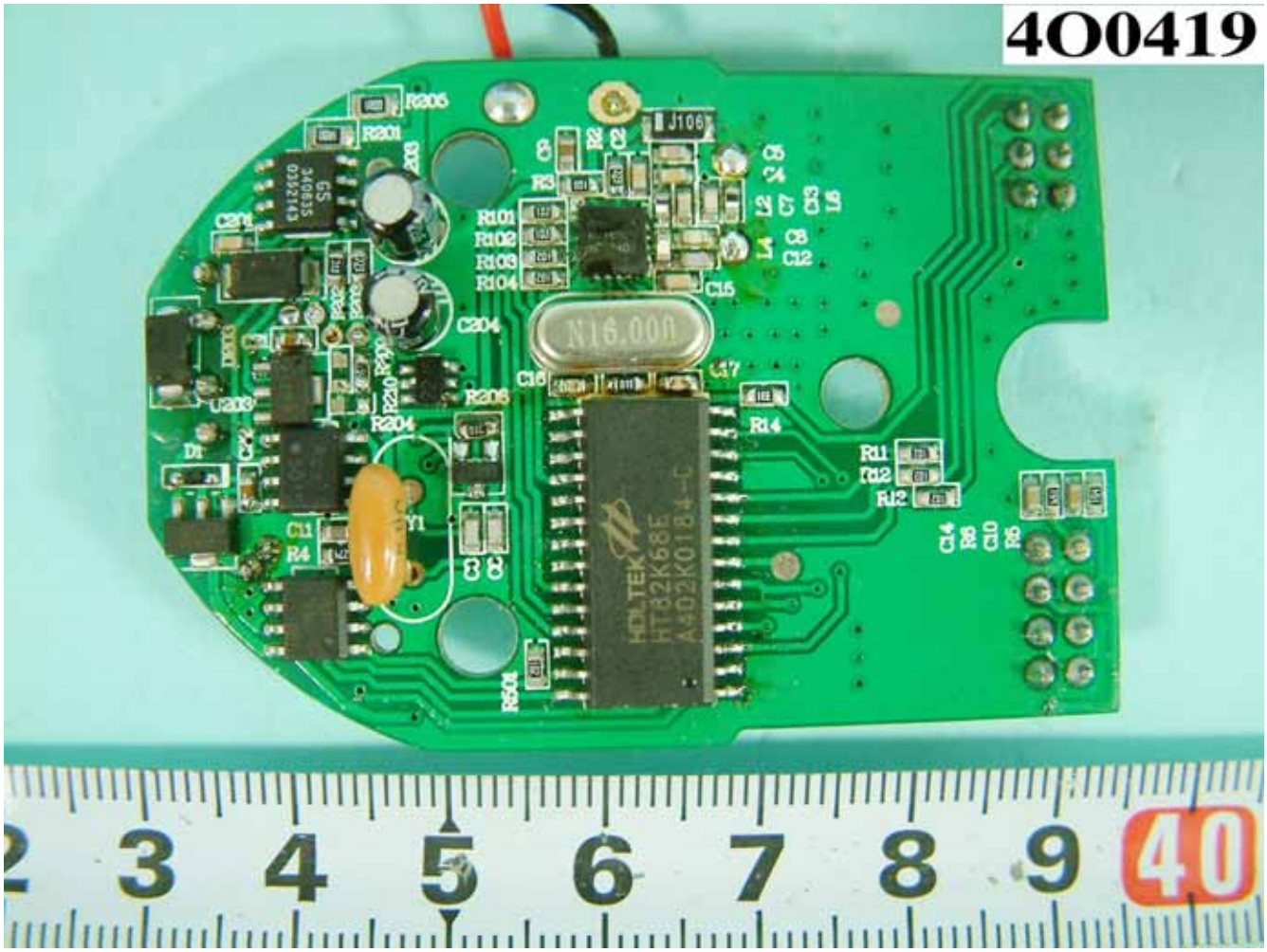
FAX : 886-2-2696-2255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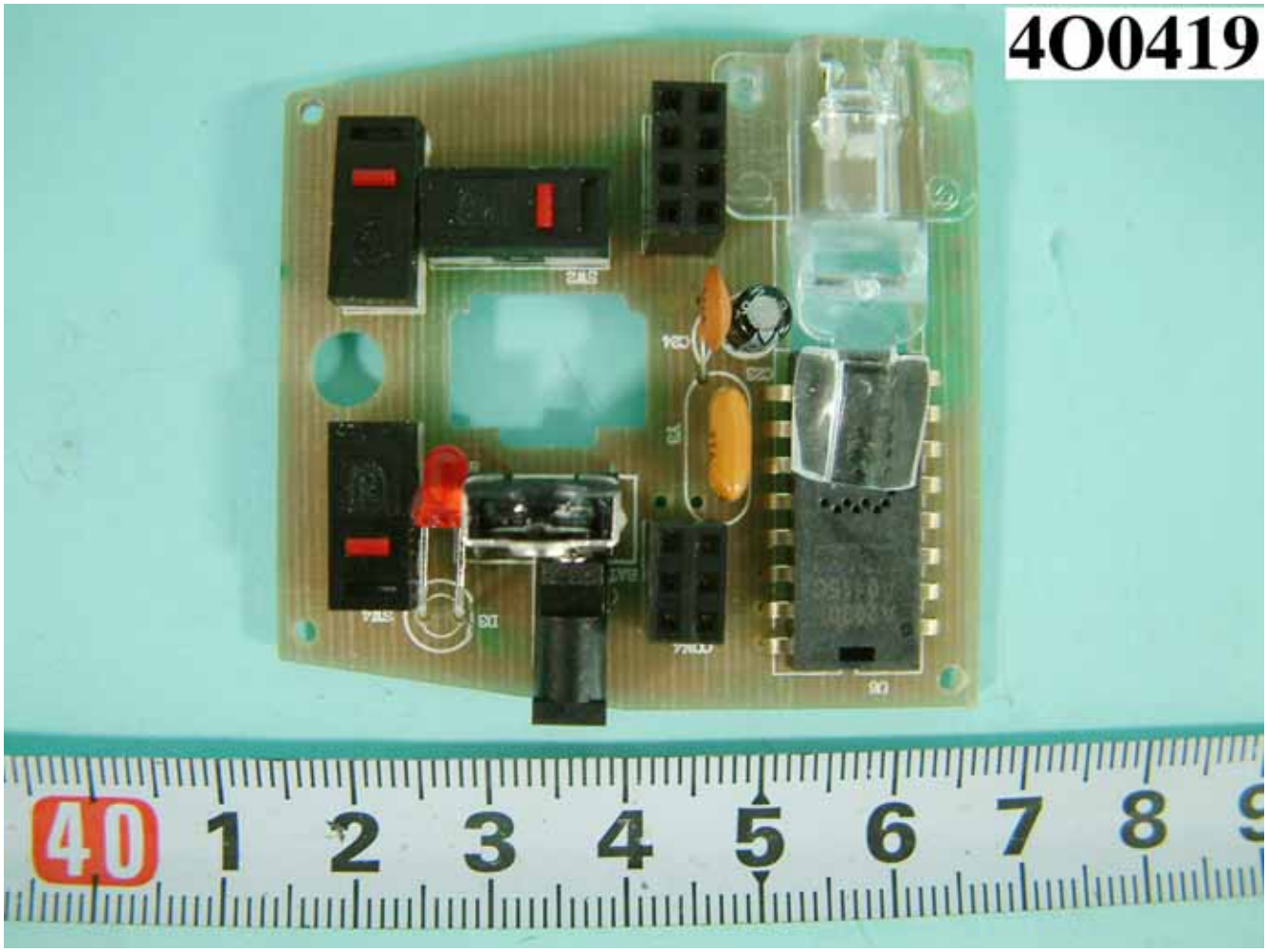

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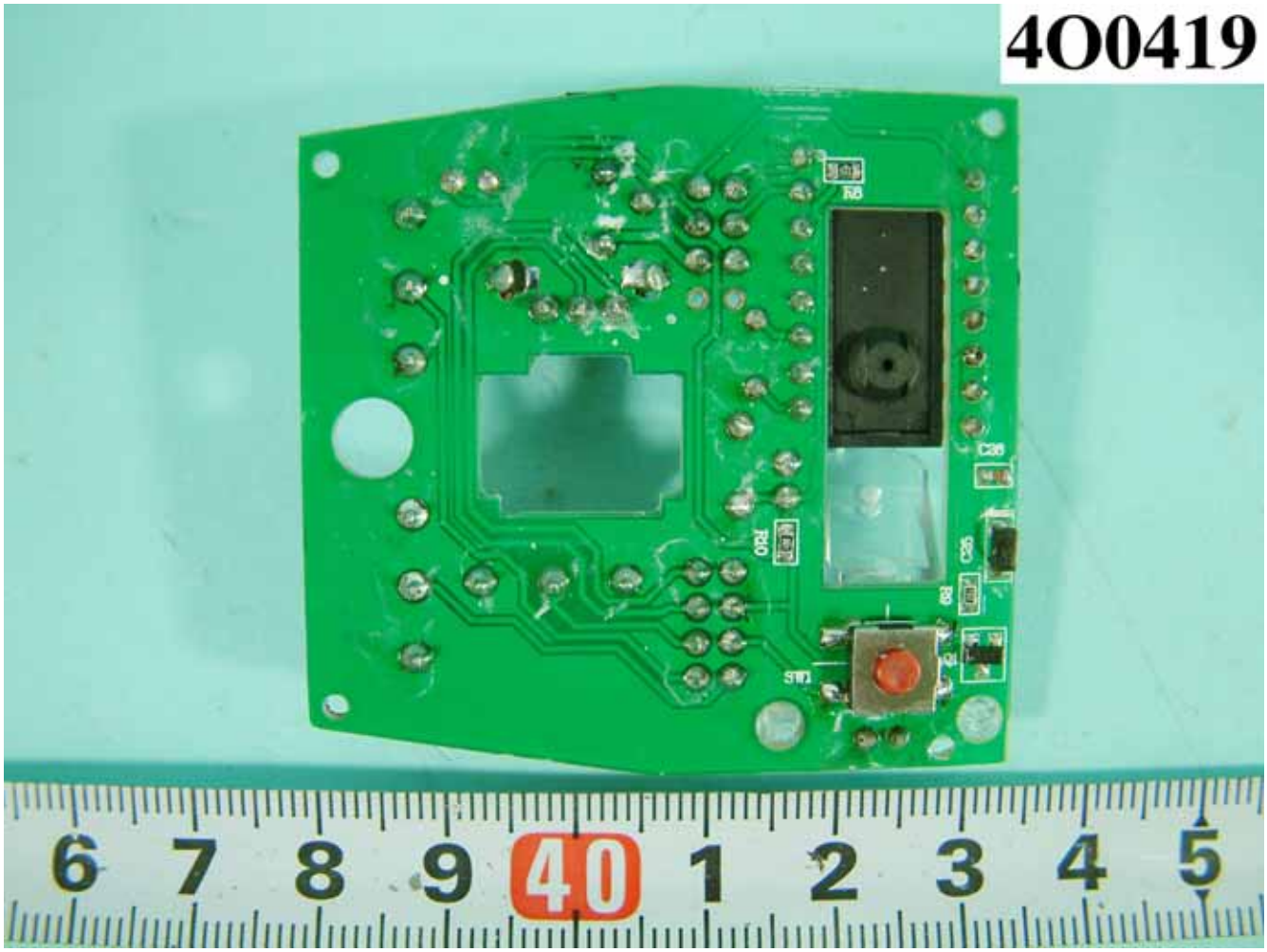

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