



Test Report

Product Name : RF MOUSE

Model No.: SD-400UB; SD-400OT; SD-800UB; SD-800OT

FCC ID.: P2I-800

Applicant : Super Device Microelectronics Co., Ltd.

Address : 12F-6, No. 2 Jian Ba Rd., Chung Ho City,
Taipei Hsien, Taiwan, R.O.C.

Date of Receipt : Oct. 17, 2002

Date of Test : Oct. 31, 2002

Report No. : 02AL119FI

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Test Date : Oct. 31, 2002

Report No. : 02AL119FI



Accredited by NIST (NVLAP)
NVLAP Lab Code: 200347-0

Product Name : RF MOUSE

Applicant : Super Device Microelectronics Co., Ltd.

Address : 12F-6, No. 2 Jian Ba Rd., Chung Ho City, Taipei
Hsien, Taiwan, R.O.C.

Manufacturer : Super Device Microelectronics Co., Ltd.

Model No. : SD-400UB; SD-400OT; SD-800UB; SD-800OT

FCC ID. : P21-800

Rated Voltage : Tx: Battery 3V; Rx: DC 5V

Trade Name : Super Device

Measurement Standard : FCC Part 15 Subpart C Paragraph 15.209

Measurement Procedure : ANSI C63.4: 1992

Test Result : Complied



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Documented By :
(Julie Xu)

Tested By :
(Tony Hsieh)

Approved By :
(Gene Chang)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	: RF MOUSE
Trade Name	: Super Device
FCC ID.	: I4L-MS6978
Model No.	: SD-400UB; SD-400OT; SD-800UB; SD-800OT
Frequency Range	: 433.92MHz
Channel Number	: 1
Type of Modulation	: AM
Channel Control	: Not Application

Note:

1. This device is a 433.92MHz RF MOUSE intends to use in household and office PC system or related application.
2. The EUT includes four model numbers, the difference between them is different OEM manufacturer.
3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209.
4. This device is a composite device in accordance with Part 15 regulations. The function receiving was measured and made a test report that the report number is 02AL119F under Declaration of Conformity.

1.2. Operational Description

The EUT is a 433.92MHz RF MOUSE intends to use in household and office PC system.

The device adapts AM modulation. The antenna soldered on PCB Provides diversity function to improve the transmitting function.

The super generation type receiver was used. An external excitation was used when the test of receiver was performed.

1.3. Tested System Details

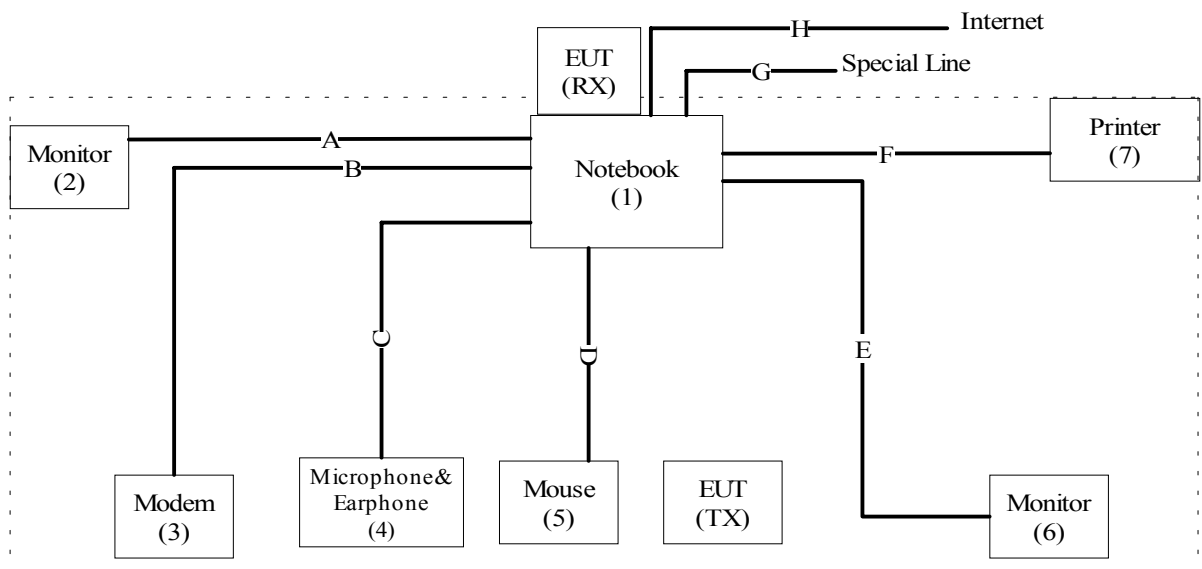
The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
(1)	Notebook	DELL	PP01L	N/A	Non-shielded, 1.8m
(2)	Monitor	ADI	CM703	038054T10203876A	Non-shielded, 1.8m
(3)	Modem	ACEEX	DM-1414	0102027557	Non-shielded,1.8m
(4)	Microphone& Earphone	TOKTO	SX-MI	N/A	N/A
(5)	Mouse	HITACHI	PC-KM1300	N/A	N/A
(6)	Monitor	SONY	PVM-14M2U	2105742	Non-shielded, 1.8m
(7)	Printer	EPSON	Color 680	023913	Non-shielded, 1.8m

	Signal Cable Type	Signal Cable Description
A.	Monitor cable	Shielded, 1.8m, one ferrite core bonded.
B.	Modem cable	Shielded, 1.5m
C.	Microphone & Earphone Cable	Non-shielded, 1.8m
D.	Mouse Cable	Non-shielded, 1.0m
E.	Monitor Cable	Shielded, 1.2m
F.	Printer Cable	Shielded, 1.7m
G.	Telecom Cable	Non-shielded, 5.0m
H.	LAN Cable	Non-shielded, 6.0m

1.4. Configuration of tested System

EUT: Tx



1.5. EUT Exercise Software

- 1.4.1 Setup the EUT and simulators as shown on 1.3.
- 1.4.2 Turn on the power of all equipment.
- 1.4.3 Notebook PC reads data from disk.
- 1.4.4 Data will be receiving through EUT.
- 1.4.5 The receive status will be shown on the monitor.
- 1.4.6 Repeat the above procedure 1.4.3 to 1.4.5

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: June 22, 2001 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2



July 03, 2001 Accreditation on NVLAP
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

2. Conducted Emission

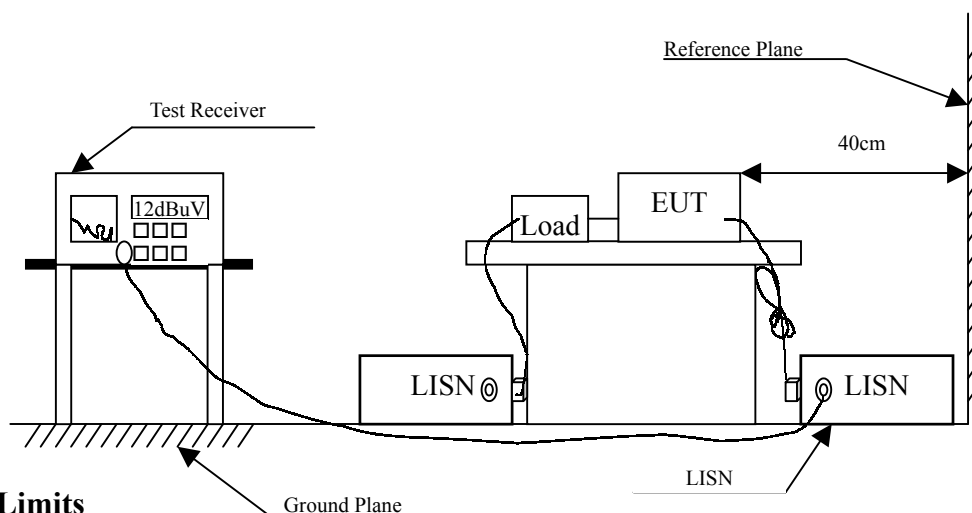
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2002	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2002	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2002	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	N/A	
5	No.2 Shielded Room			N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Paragraph 15.207 (dBuV)		
Frequency MHz	Limits	
	Quasi-peak	Average
0.15 – 0.5	66 to 56	56 to 46
0.5 – 5	56	46
5 – 30	60	50

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4:1992 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Result of Conducted Emission

Product : RF MOUSE
Test Item : Conducted Emission Test
Test Site : No.4 Shielded Room
Power Line : Line 1
Test Mode : Normal Operation

EUT is a DC operating device, so all the test items related to AC mains were omitted.

3. Radiated Emission

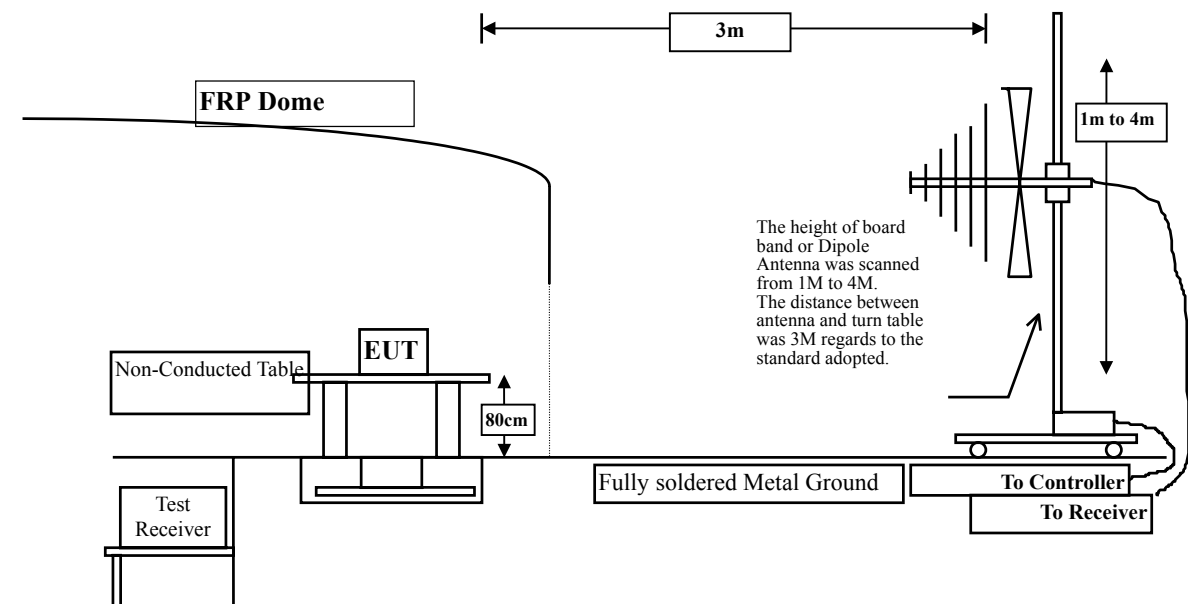
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1		Test Receiver	R & S	ESCS 30 / 825442/14	May, 2002
		Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2002
		Pre-Amplifier	HP	8447D/3307A01812	May, 2002
		Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2002
		Horn Antenna	EM	EM6917 / 103325	May, 2002
Site # 2	X	Test Receiver	R & S	ESCS 30 / 825442/17	May, 2002
	X	Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2002
	X	Pre-Amplifier	HP	8447D/3307A01814	May, 2002
	X	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2002
	X	Horn Antenna	EM	EM6917 / 103325	May, 2002

- Note:
1. All equipments that need to calibrate are with calibration period of 1 year.
 2. Mark "X" test instruments are used to measure the final test results.

3.2. Test Setup



3.3. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 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.

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:1992 on radiated measurement.

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

The frequency range from 30MHz to 10th harmonics is checked.

3.5. Test Result of Radiated Emission

Product : RF MOUSE
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.2 OATS
 Test Mode : Normal Operation

Frequency	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
	Loss	Factor		Level	Level		
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

1301.758	3.01	25.06	19.96	23.81	31.91	42.09	74.00
<1735.684	3.42	26.65	19.96	24.13	34.24	39.76	74.00
<2169.604	3.91	28.11	19.93	24.89	36.97	37.03	74.00
<2603.479	4.20	29.09	19.91	25.17	38.55	35.45	74.00
<3037.381	4.67	30.61	19.81	26.41	41.89	32.11	74.00
<3471.331	4.90	30.78	19.78	25.01	40.91	33.09	74.00
<3905.247	5.19	32.60	19.86	25.41	43.33	30.67	74.00
<*4338.117	5.66	32.86	19.93	25.14	43.73	30.27	74.00

Average Detector:

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Vertical

Peak Detector:

1301.775	3.01	25.06	19.96	23.87	31.97	42.03	74.00
<1735.649	3.42	26.65	19.96	23.95	34.06	39.94	74.00
<2169.594	3.91	28.11	19.93	24.47	36.55	37.45	74.00
<2603.471	4.20	29.09	19.91	25.73	39.11	34.89	74.00
<3037.379	4.67	30.61	19.81	25.18	40.66	33.34	74.00
<3471.284	4.90	30.78	19.78	25.14	41.04	32.96	74.00
<3905.248	5.19	32.60	19.86	25.25	43.17	30.83	74.00
<*4339.016	5.66	32.86	19.93	25.37	43.96	30.04	74.00

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
4. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : RF MOUSE
Test Item : General Radiated Emission Data
Test Site : No.2 OATS
Test Mode : Normal Operation

Frequency	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
	Loss	Factor		Level	Level		
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal							
63.485	1.04	5.73	0.00	12.01	18.78	21.22	40.00
116.345	1.32	11.96	0.00	10.36	23.64	19.86	43.50
176.451	1.63	8.43	0.00	13.47	23.52	19.98	43.50
228.954	1.90	9.52	0.00	14.02	25.45	20.55	46.00
341.021	2.47	12.83	0.00	11.50	26.80	19.20	46.00
*433.872	2.95	15.75	0.00	26.49	45.19	0.81	46.00
386.231	2.71	13.96	0.00	9.50	26.17	19.83	46.00
Vertical							
82.648	1.14	7.53	0.00	14.25	22.92	17.08	40.00
130.252	1.39	10.59	0.00	10.63	22.61	20.89	43.50
176.364	1.63	8.35	0.00	12.02	21.99	21.51	43.50
246.998	1.98	11.51	0.00	15.20	28.70	17.30	46.00
332.011	2.43	12.59	0.00	11.69	26.71	19.29	46.00
*433.871	2.95	17.29	0.00	19.70	39.94	6.06	46.00
56.831	1.00	5.60	0.00	17.11	23.71	16.29	40.00

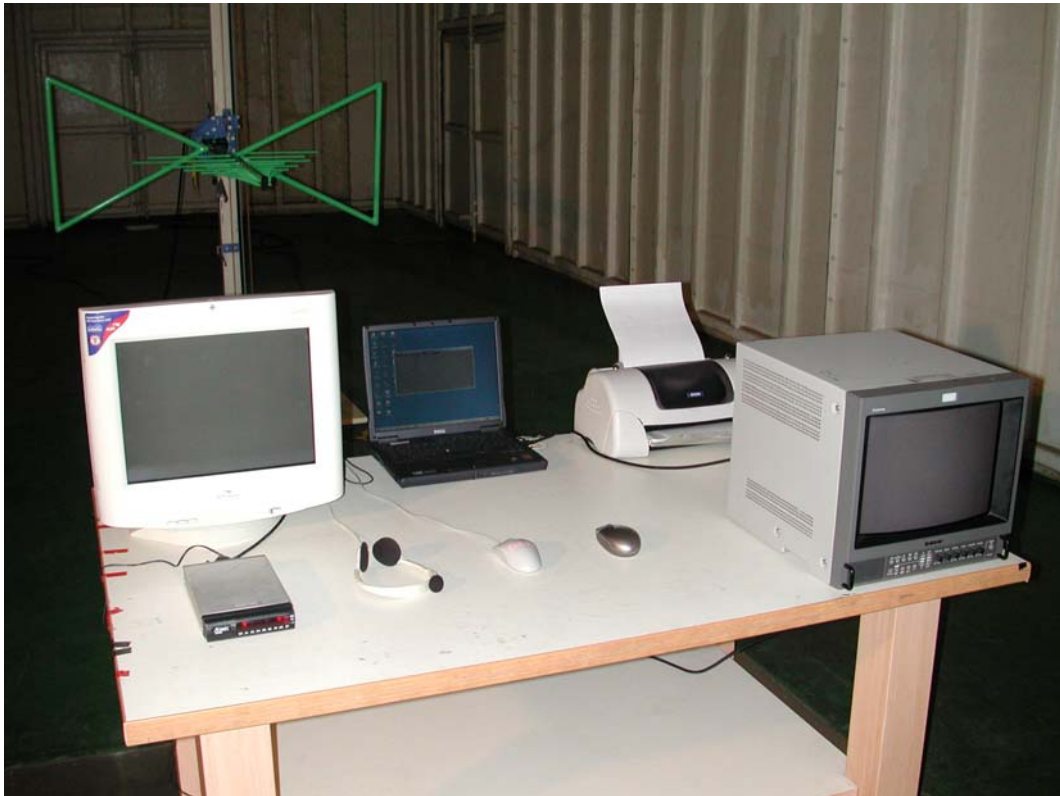
Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Attachment 1: EUT Test Photographs

Attachment 1: EUT Test Setup Photographs

Front View of Radiated Test



Back View of Radiated Test



Front View of High Frequency Radiated Test



Attachment 2: EUT Detailed Photographs

Attachment 2 : EUT Detailed Photographs

(1) EUT Photo



(2) EUT Photo



(3) EUT Photo



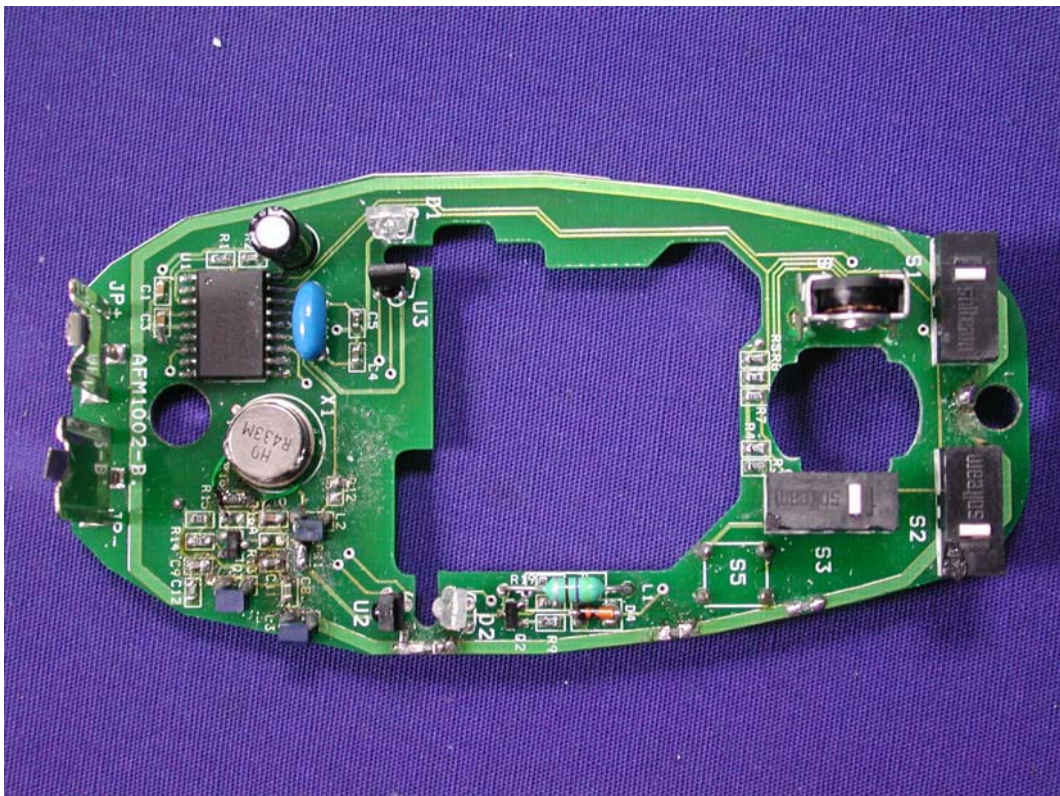
(4) EUT Photo



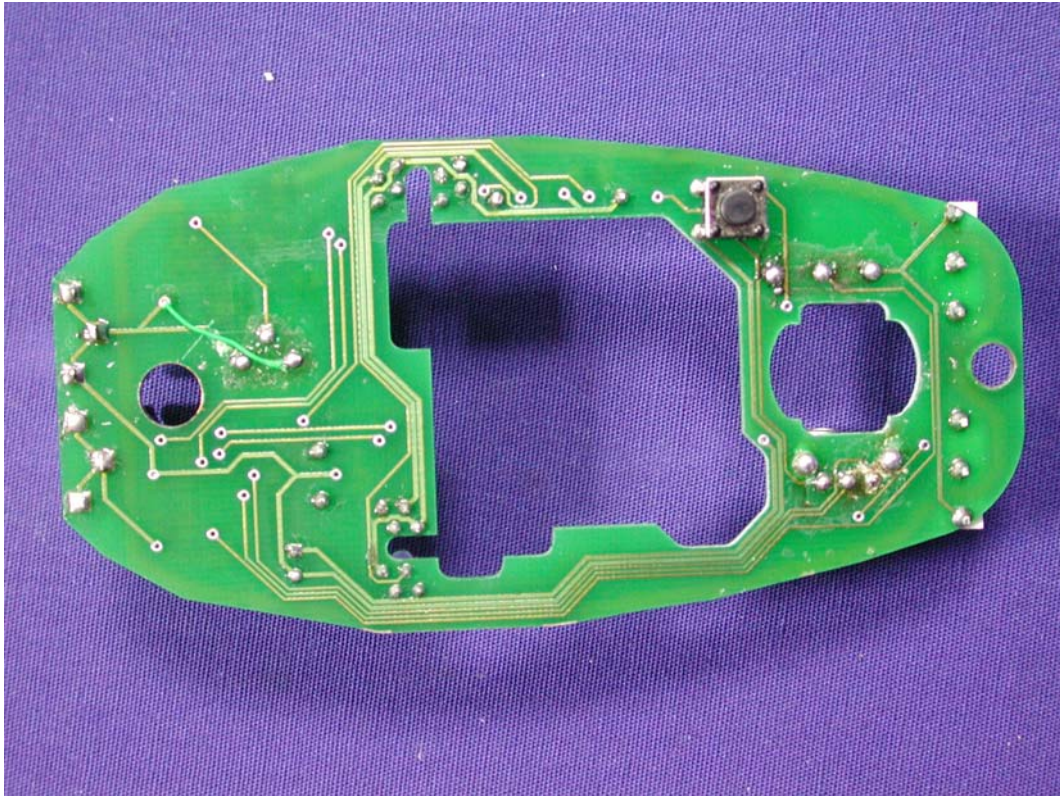
(5) EUT Photo



(6) EUT Photo



(7) EUT Photo



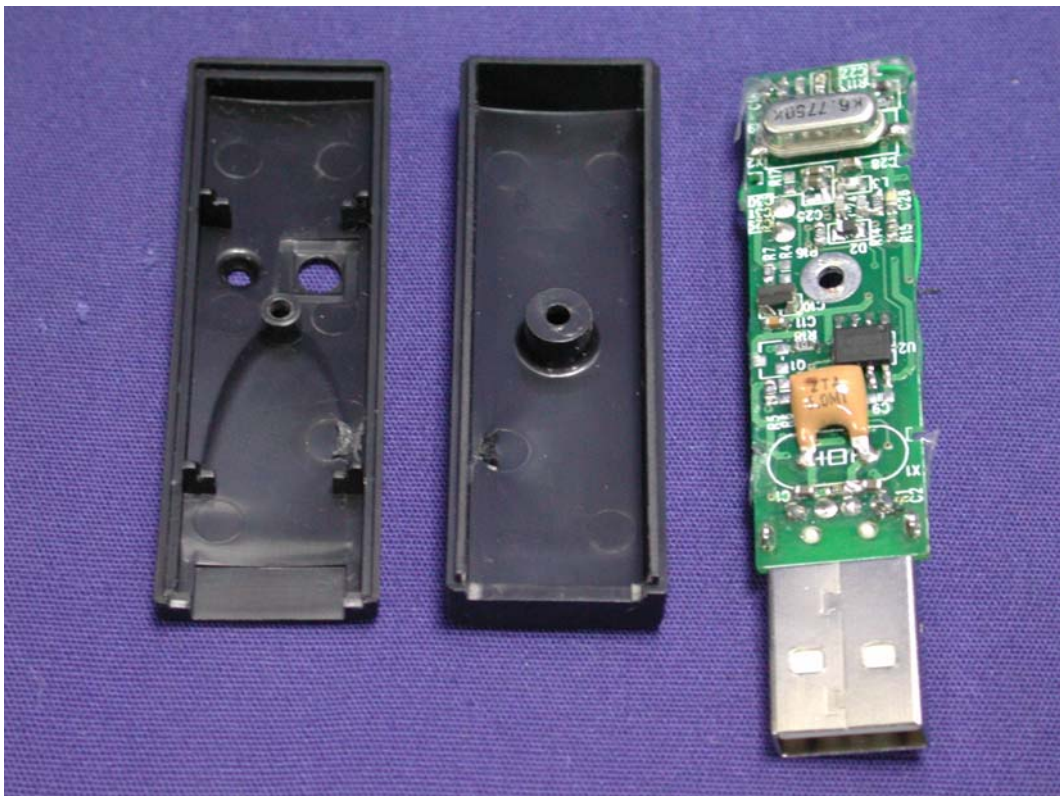
(8) EUT Photo



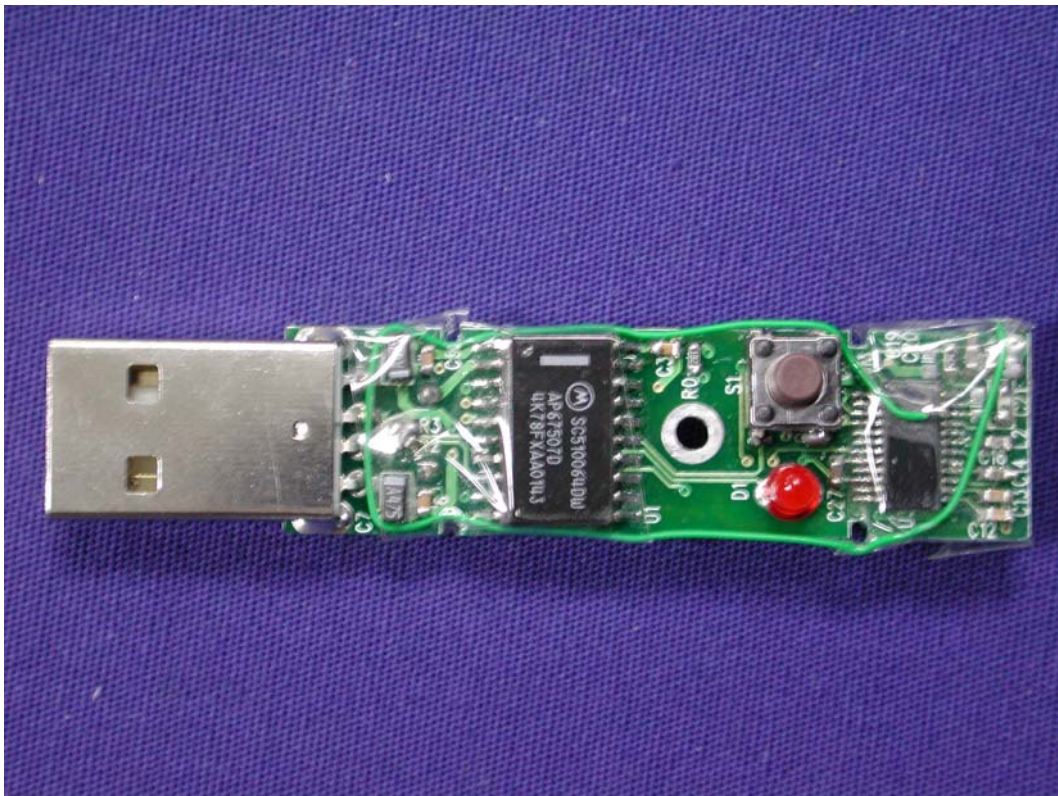
(9) EUT Photo



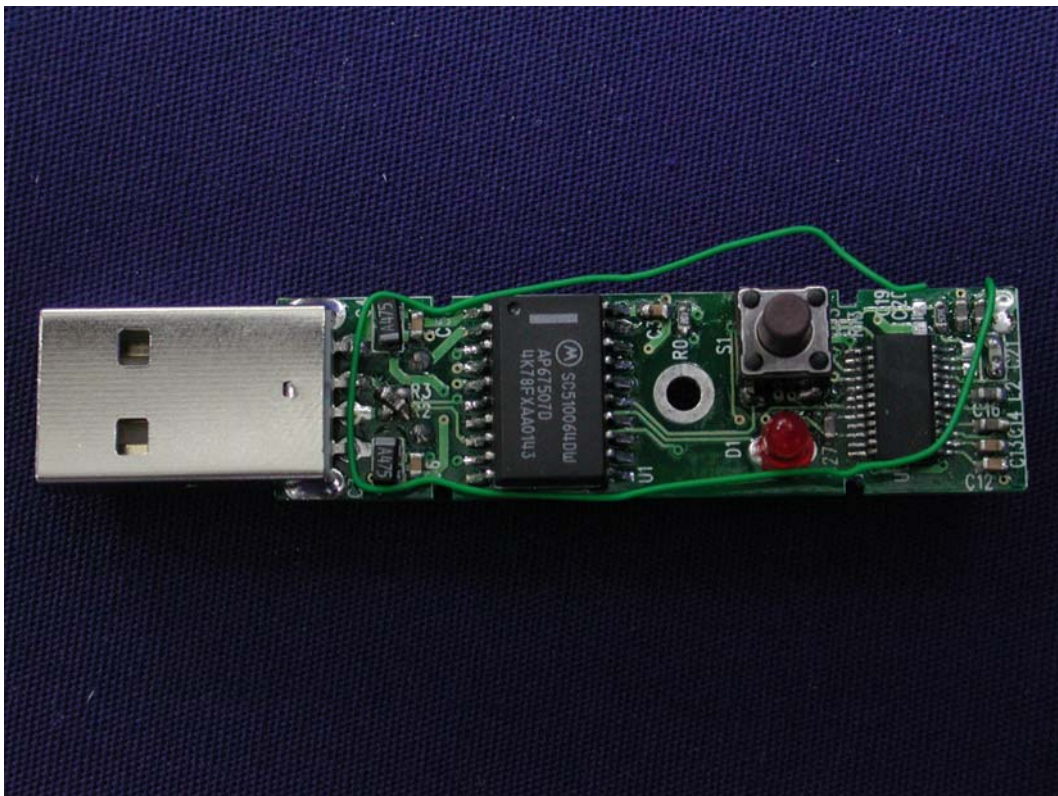
(10) EUT Photo



(11) EUT Photo



(12) EUT Photo



(13) EUT Photo

