

Certificate of Test

August 2006

Cherry GmbH

Product Type : Wireless MultiMedia Desktop keyboard

Model Number : G257

Test Report Number : 0607118 Rev. 1

Date of Test : July 31, 2006- August 03, 2006

This Product was tested to the following standards at the laboratory of Global EMC Standard Tech. Corp., and found Compliance.

Standards:

FCC Part 15 Subpart C Paragraph 15.227

ANSI C63.4: 2003

[http : //www.gestek.com.tw](http://www.gestek.com.tw)



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Date: August 04, 2006



200085-0





**Test Report
Application for
Certification
On Behalf Of**

Cherry GmbH

**EUT:
Wireless MultiMedia Desktop keyboard**

**Model Number:
G257**

**FCC ID:
GDDG257**

**Prepared for:
Cherry GmbH
Cherrystrasse D91275 Auerbach/Opf. Germany**

**Report By :Global EMC Standard Tech. Corp.
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1. CERTIFICATION

Applicant : Cherry GmbH

EUT Description : Wireless MultiMedia Desktop keyboard
 Model Number : G257
 Serial Number : N/A
 Brand Name : CHERRY
 FCC ID : GDDG257
 Tested Power Supply : DC 3V
 Manufacturer : Sunrex Technology Corp.
 Address : No. 188-1, Chung Cheng Road., Ta Ya Shiang, Taichung Hsien, Taiwan, R.O.C.

MEASUREMENT PROCEDURES USED:

- CFR 47, Part 15** Radio Frequency Device Subpart C Intentional Radiators :2005
- ANSI C63.4** Methods of Measurements of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the range of 9kHz To 40GHz. 2003

THE MEASUREMENT SHOWN IN THE ATTACHMENT WAS MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE ABOVE LIMITS APPLICABLE.

Sample Received Date : **July 31, 2006**

Final Test Date : **August 03, 2006**

In order to ensure the quality and accuracy of this document, the contents have been thoroughly reviewed by the following qualified personnel from GesTek Lab.

Documented By :

Rini Chen

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This test data shown below is traceable to National or international standard such as NIST/USA, etc. The laboratory's NVLAP accreditation in no way constitutes or implies product certification, approval, or endorsement by NVLAP or the United States government.

2. GENERAL INFORMATION

2.1 PRODUCTION DESCRIPTION

Product Name : Wireless MultiMedia Desktop keyboard
Model Number : G257
Serial Number : N/A
Brand Name : CHERRY
FCC ID : GDDG257
Modulation Type : GFSK
Frequencg Range : 26.995MHz~27.195MHz
Antenna Type : LOOP
Type of Antenna joint : Soldered on PCB
Channel Number : 5 Channel
Channel Control : Manual
Working Voltage : Battery DC 3V

Frequency of Each Channel:

Channel	Frequency (MHz)
1	26.995
2	27.045
3	27.095
4	27.1495
5	27.195

Note:

1. This device is a Wireless MultiMedia Desktop keyboard included transmitter.
2. This device is five channel and perform the test, then record on this report.
3. The antenna of EUT is solder on PCB and conform to FCC 15.203.
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.227
5. The device is a transmitter equipment to accordance with Part 15 regulations. The function receiving was under Declaration of Conformity.

2.2 OPERATIONAL DESCRIPTION

This device is Wireless MultiMedia Desktop keyboard and powered by DC 3V battery.

This device only five channel with GFSK modulation.

The Receiver is usb interface can receive signal from transmitter to control PC or notebook.

Another information please refer to users manual.

2.3 TEST MODES & EUT COMPONENTS DESCRIPTION

EUT: Wireless MultiMedia Desktop keyboard, M/N: G257	
Test Mode	Mode 1 Continue Transmit
Channel 3	27.095MHz

2.4 SUMMARY OF TEST PROCEDURE AND TEST RESULTS

Test Item	Applied Standard Section	Test Result
Radistion Emission	15.209, ANSI C63.4 Section 8	Pass (refer to section 3.7.2)
Peak Power Output	15.227(a), ANSI C63.4 Section 13 & Annex I	Pass (refer to section 3.7.1)
Band Edge	15.227(b) , ANSI C63.4 Section 13 & Annex I	Pass (refer to section 3.7.3)

2.5 CONFIGURATION OF THE TESTED SYSTEM

The FCC IDs/Types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Device	No.	Configuration
NOTEBOOK	DELL NB 2	Model Number : Latitude D600 PPO5L BSMI ID : R33002 Serial Number : 11444680576 C.P.U : Intel Pentium M 1.4G HZ DDR : PC2100 256MB F.D.D : N/A H.D.D. : Manufacturer : HITACHI 20.G M/N: IC25N020ATMR04-0, S/N:MRG157K1GJP9JH BSMI ID:D33082 CD-ROM : Manufacturer :DELL M/N:6T980-A01 BATTERY : Manufacturer :DELL Li-ion MODULE M/N:6Y270 RATING:14.8V 220mAh AC ADAPTOR : Manufacturer :DELL M/N: PA-1650-05D S/N:CN-05U092-71615-41K-58C3 INPUT:AC 100-240 V~1.5A 50-60HZ Shielded, Undetachable, 2.5m
Receiver	-----	Manufacturer : CHERRY Model Number : R660 USB Cable : 1.5m

2.6 TEST FACILITY

Ambient conditions in the laboratory:

ITEMS	REQUIORED
TEMPERATURE (°C)	15-35
HUMIDITY (%RH)	30-60
BAROMETRIC PRESSURE (mbar)	860-1060
FCC SITE DESCRIPTION	Aug. 10, 1995 /Aug. 25, 1998 File on FCC Engineering Laboratory Federal Communication Commission 7435 Oakland Mills Road Columbia, MD 21046 Reference 31040/SIT1300F2
NVLAP LAB. CODE	200085-0 United Stated Department of commerce National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program Accreditation on NVLAP effective through Sep. 30,2006 For CISPR 22, FCC Method and AS/NZS CISPR 22 Measurement.
Chinese National Laboratory Accreditation Certificate R.O.C.	Recognized by the Council of Chinese National Laboratory Accreditation and confirmed to meet the requirements of ISO/IEC 17025 also has been registered for fifteen items, and meet the requirements of the Article 4 of Measures Governing the Recognition both Approval of Designated Laboratory for Commodities Inspection and has been registered for four items within the field of Electrical Testing. Registration No.: 1082 Registration on CNLA effective through April 30, 2006.

2.7 TEST SETUP

EUT:

Wireless MultiMedia Desktop keyboard



RX

NOTEBOOK

2.8 EUT OPERATING CONDITIONS

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 2.6.
2. Turn on the power of all equipments.
3. The transmitter will transmit the signal continue.
4. Confirm the receiver is receive signal continue.
5. Repeat the above steps.

3. RADIATION EMISSION DATA

3.1 TEST EQUIPMENT

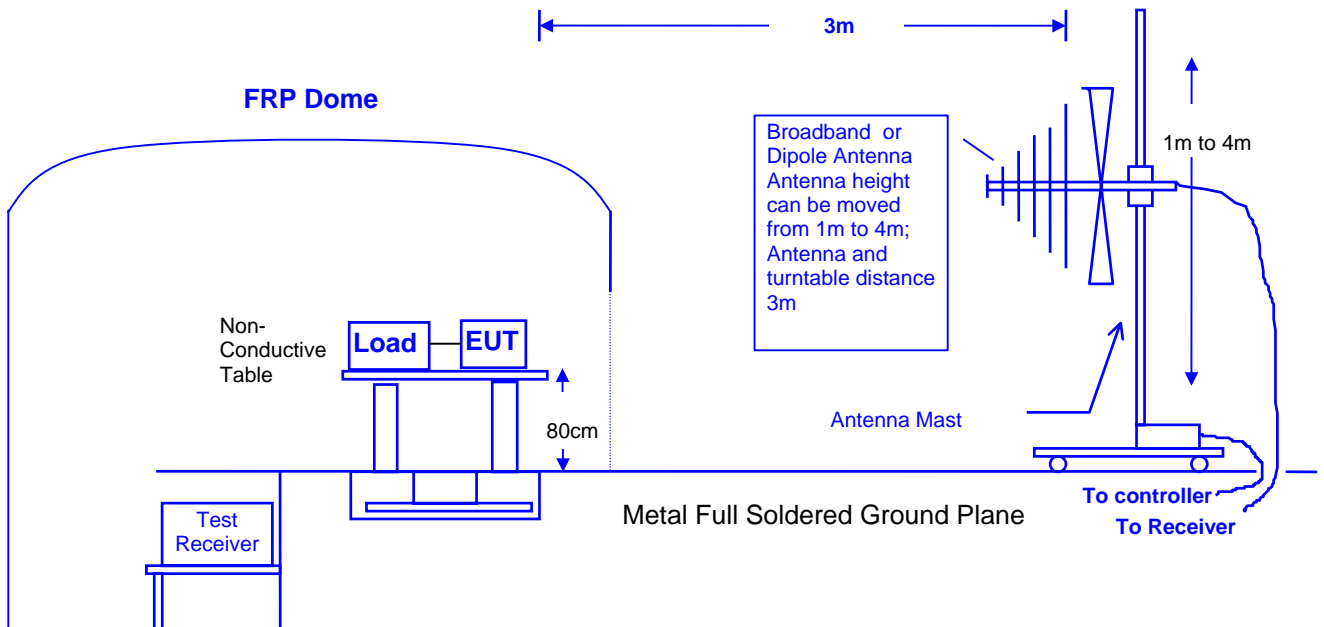
The following test equipments are used during the radiated emission tests:

Radiated test was performed on: Site #1 Site #2 Site #3 Site #4

Item	Instrument	Manufacturer	Model	Serial No.	Last Cal.
1	Test Receiver	Rohde & Schwarz	ESVS30	829007/014	01/19/06
2	Spectrum Analyzer	Rohde & Schwarz	FSP40	100061	04/03/06
3	Spectrum Analyzer	HP	8447D	2944A08272	07/26/06
4	Power Meter	Rohde & Schwarz	NRVS	100666	04/07/06
5	Peak Power Sensor	Rohde & Schwarz	NRV-Z32	836019-058	04/07/06
6	Bilog Antenna	SCHAFFNER	CBL6112B	2620	11/26/05
7	Loop Antenna	EMCO	6509	9601-1389	05/04/06
8	RF Cable	GesTek	N/A	GTK-E-A152-01	12/20/05
9	Open Site	GesTek	N/A	B1	11/22/05
10	Test Program Software	GesTek	N/A	GTK-E-S001-01	N/A

Note: All measurement critical items of test instrumentation were within their calibration period of 1 year.

3.2 OPEN TEST SITE SETUP DIAGRAM



3.3 RADIATED EMISSION LIMIT

FCC 15.227 Fundamental Emission Limits

Frequency	Distance	Field Strength of Fundamental	
MHz	Meter	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
26.96 – 27.28	3	10,000	80

Remarks :

1. The emission limit is base on measurement instrumentation employing an average detector.
2. RF Voltage ($\text{dB}\mu\text{V/m}$) = $20 \log$ RF Voltage ($\mu\text{V/m}$)
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.

General Radiated Emission Limits

The filed strength of any emissions which appear outside of this band (26.96 – 27.28 MHz) shall not exceed the general radisted emission limits in Section 15.209.

Frequency	Distance	Field Strength	
MHz	Meter	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
1.705 to 30	30	30	29.5
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0

Remarks :

1. RF Voltage ($\text{dB}\mu\text{V/m}$) = $20 \log$ RF Voltage ($\mu\text{V/m}$)
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 EUT CONFIGURATION

The equipment which is listed 2.6 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 4.2, was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degree. The measurement antenna was mounted to a non-conductive mast. Antenna height was varied from 1 meter to 4 meters and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization. Also the I/O cable position was investigated to find the maximum emission condition.

3.5 OPERATING CONDITION OF EUT

Same as section 2.7.

3.6 RADIATED EMISSION DATA

The measurement range of radiated emission, which is from [Fundamental frequency to 1GHz](#), was investigated. All readings below 1GHz are quasi-peak values with a resolution bandwidth of 9kHz for below 30MHz and 120 KHz for 30MHz to 1GHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement. Then the worst modes were reported the following data pages.

3.7 RADIATED EMISSIONS MEASUREMENT RESULTS

3.7.1 FUNDAMENTAL RADIATED EMISSIONS

Date of Test	August 03, 2006	Temperature	25.6 deg/C
EUT	Wireless MultiMedia Desktop keyboard	Humidity	63 %RH
Working Cond.	Channel 3: 27.095MHz		
Antenna distance	3m		

No.	Frequency MHz	Reading Level dBuV	Factor dB	Measurement dBuV/m	Limit dBuV/m	Over Limit dB	Detector
1	27.1000	57.13	15.81	72.94	100.00	-27.06	Peak

Remark

1. The Readings are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=10kHz, VBW=100kHz.
3. AVG Emission=Peak Emission + Duty Cycle(Log Scale).
4. Emission Level= Reading + Correction Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
5. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor
6. Margin Value=Emission level-Limit value.
7. The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
8. The Duty Cycle is refer to section 4.
9. If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

3.7.2 BAND EDGE RESULT

Date of Test	August 03, 2006	Temperature	27.2 deg/C
EUT	Wireless MultiMedia Desktop keyboard	Humidity	41 %RH
Working Cond.	Channel 1: 26.995MHz Channel 5: 27.195MHz		
Antenna distance	3m		

Radiated Emission @ 3meter

No.	Frequency [MHz]	Reading Level [dB(uV/m)]	Correction Factor [dB/m]	Emission Level [dB(uV/m)]
1	26.96	34.68	15.74	50.42
2	27.28	32.39	15.91	48.30
3	27.30	36.70	15.92	52.62

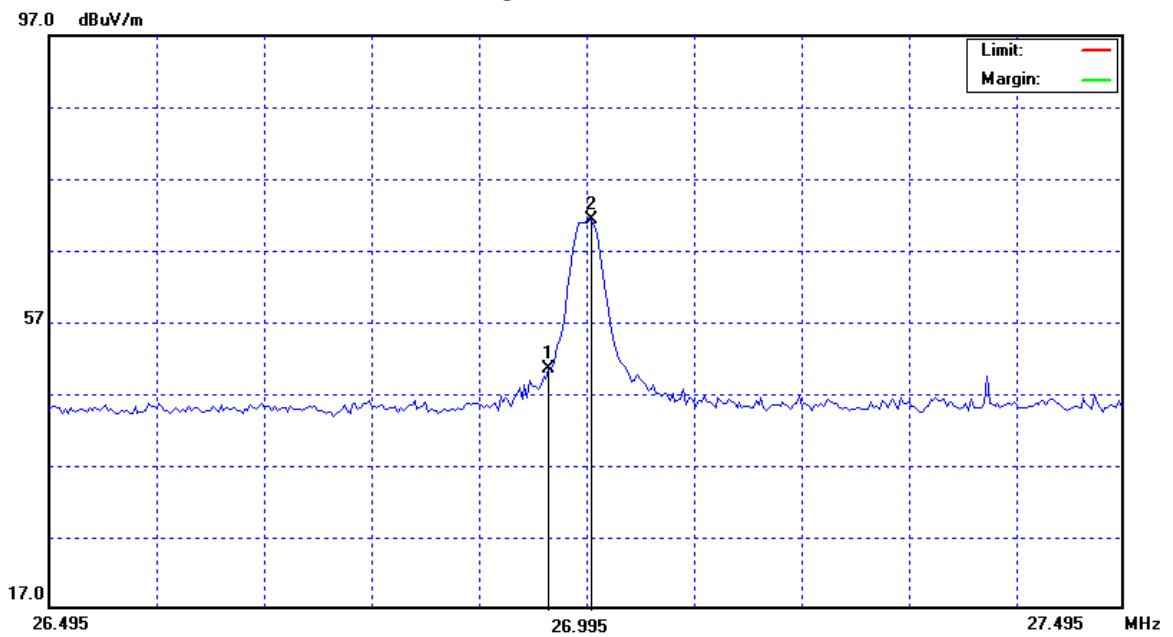
Radiation Emission @ 30 meter

No.	Frequency [MHz]	Emission Level [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1	26.96	10.42	29.5	-19.08
2	27.28	8.30	29.5	-21.20
3	27.30	12.62	29.5	-16.88

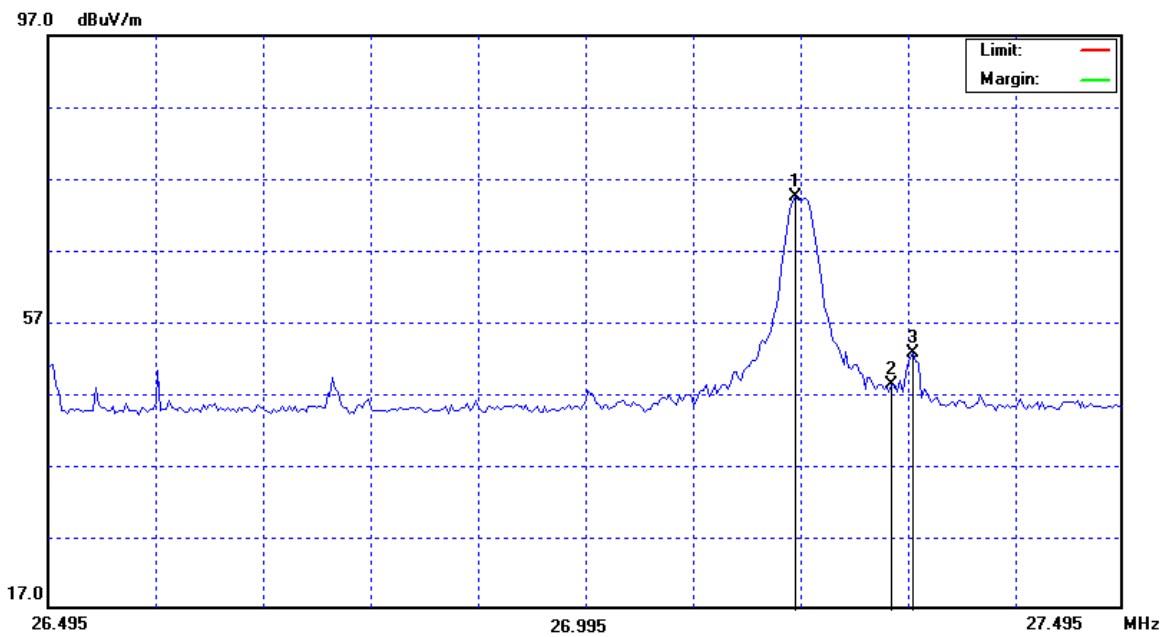
Remark

1. The Readings are peak .
2. Spectrum Analyzer Setting(Peak Detector): RBW=10kHz, VBW=100kHz.
3. AVG Emission=Peak Emission + Duty Cycle(Log Scale).
4. Emission Level= Reading + Correction Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
5. Correction Factor= Antenna Factor + Cable Loss – Amplifier Factor
6. Margin Value=Emission level-Limit value.
7. The average measurement was not performed when the peak measured data under the limit of average detection. If the average value is measured, peak measurement should also be supplied.
8. The measurement distance is 30 meter for 1.703MHz – 30MHz band which required in 15.209. When performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by using the square of an inverse linear distance extrapolated factor (40dB/decade).
9. The Duty Cycle is refer to section 4.
10. If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

LOW BAND



HIGH BAND



3.7.3 HARMONIC RADIATED EMISSIONS

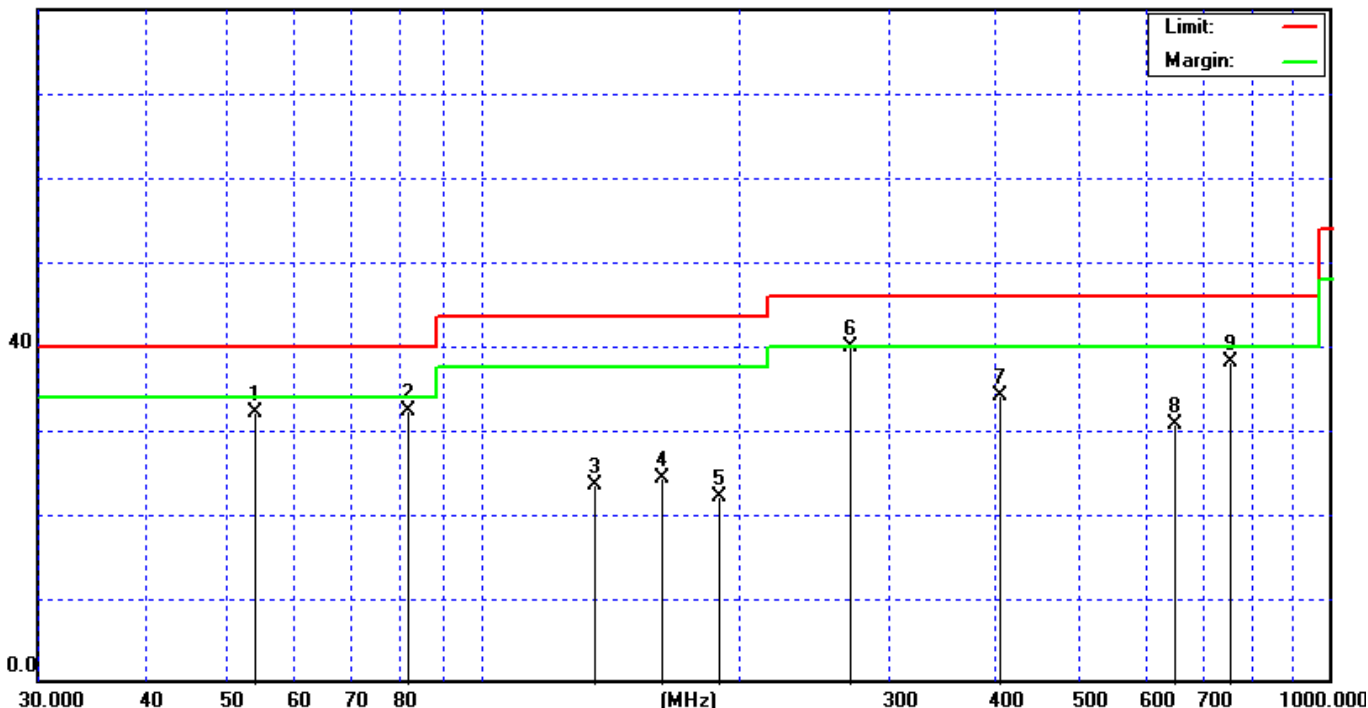
Date of Test	August 02, 2006	Temperature	25 deg/C
EUT	Wireless MultiMedia Desktop keyboard	Humidity	59 %RH
Working Cond.	Channel 3		
Antenna distance	3m at Horizontal	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBuV	Factor dB	Measurement dBuV/m	Limit dBuV/m	Over Limit dB	Detector
1	54.0300	48.40	-16.23	32.17	40.00	-7.83	QP
2	81.2900	49.32	-17.04	32.28	40.00	-7.72	QP
3	135.4780	35.04	-11.58	23.46	43.50	-20.04	QP
4	162.5380	37.14	-12.83	24.31	43.50	-19.19	QP
5	189.6500	35.32	-13.22	22.10	43.50	-21.40	QP
6	270.9600	49.87	-9.91	39.96	46.00	-6.04	QP
7	404.9800	38.90	-4.81	34.09	46.00	-11.91	QP
8	650.2760	31.87	-1.09	30.78	46.00	-15.22	QP
9	758.7400	37.45	0.63	38.08	46.00	-7.92	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. The " X " means this data is worst-case Measurement level.

80.0 dBuV/m



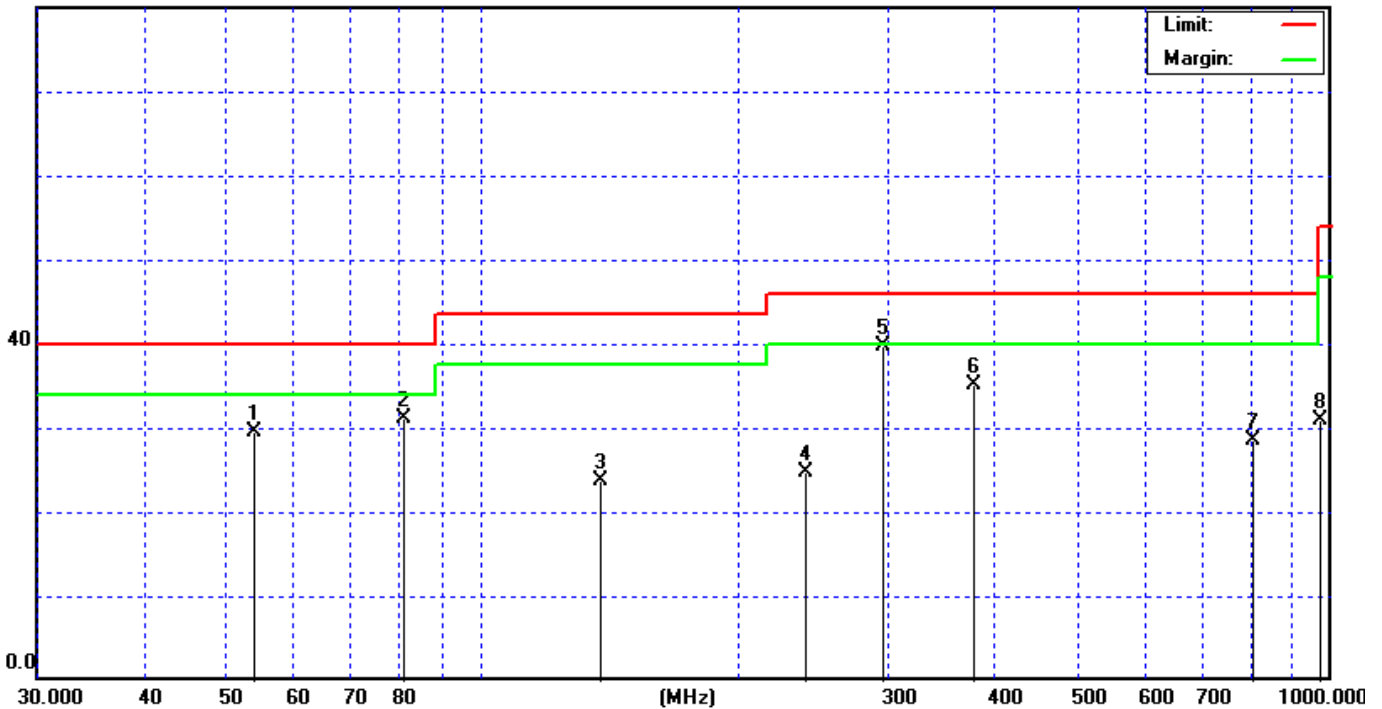
Date of Test	July 31, 2006	Temperature	25 deg/C
EUT	Wireless MultiMedia Desktop keyboard	Humidity	59 %RH
Working Cond.	Channel 3		
Antenna distance	3m at Vertical	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBuV	Factor dB	Measurement dBuV/m	Limit dBuV/m	Over Limit dB	Detector
1	54.0000	45.70	-16.22	29.48	40.00	-10.52	QP
2	81.0000	48.12	-17.11	31.01	40.00	-8.99	QP
3	137.4420	35.35	-11.61	23.74	43.50	-19.76	QP
4	240.0020	36.45	-11.75	24.70	46.00	-21.30	QP
5	297.0000	47.83	-8.06	39.77	46.00	-6.23	QP
6	378.0000	40.63	-5.52	35.11	46.00	-10.89	QP
7	809.8180	26.97	1.49	28.46	46.00	-17.54	QP
8	971.8020	25.71	5.20	30.91	54.00	-23.09	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. The " " means this data is worst-case Measurement level.

80.0 dBuV/m



4. DUTY CYCLE

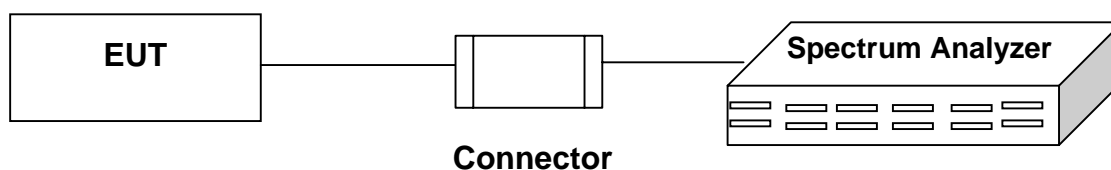
4.1 TEST EQUIPMENT

The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	Serial No.	Last Cal.
1	Spectrum Analyzer	Rohde & Schwarz	FSP40	100061	04/03/06
2	Spectrum Analyzer	HP	E4407B	39240339	07/26/06

Note: All measurement critical items of test instrumentation were within their calibration period of 1 year.

4.2 BLOCK DIAGRAM OF TEST SETUP



4.3 TEST RESULT

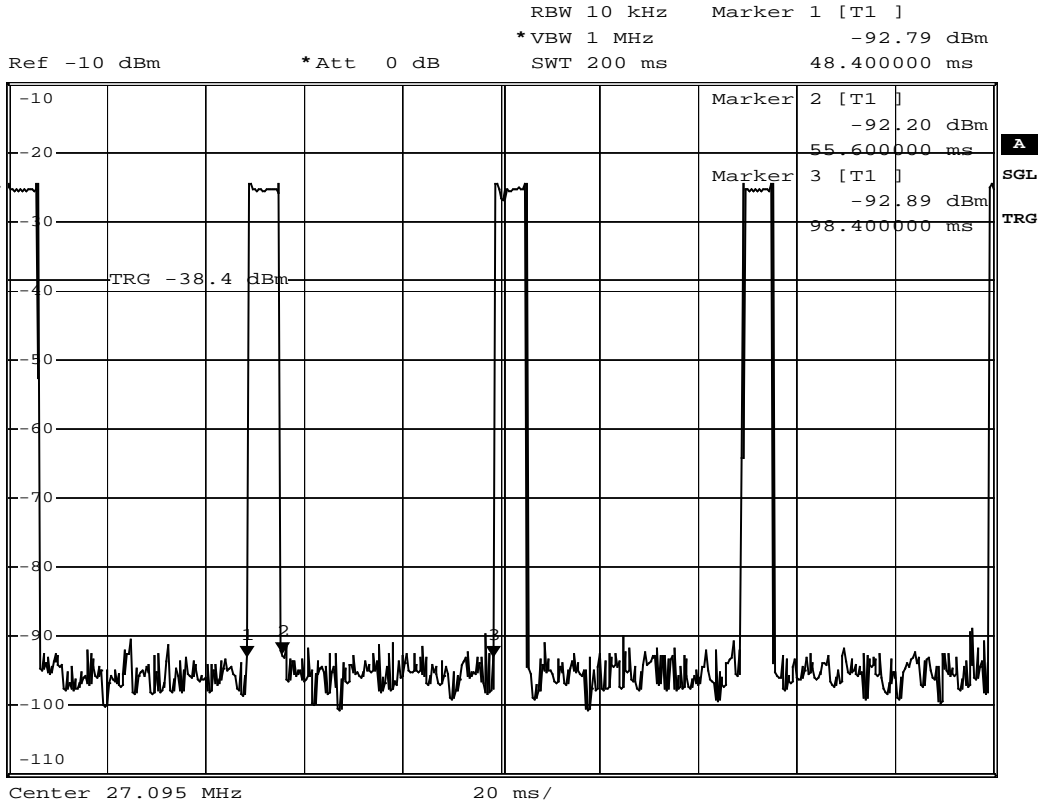
Date of Test	August 03, 2006	Temperature	27.1 deg/C
EUT	Wireless MultiMedia Desktop keyboard	Humidity	43 %RH
Working Cond.	Channel 3: 27.095MHz		

Duty Cycle = Time on of one cycle / Totally time of one cycle

Frequency 27.095 MHz
 Time on of one slot length = 7.2 (msec)
 Time on of one cycle = 7.2 (msec)
 Totally time of one cycle = 50 (msec)
 Duty Cycle = 7.2 / 50 = 0.144
20 log 0.144 = -16.832 dB

Remark:

If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

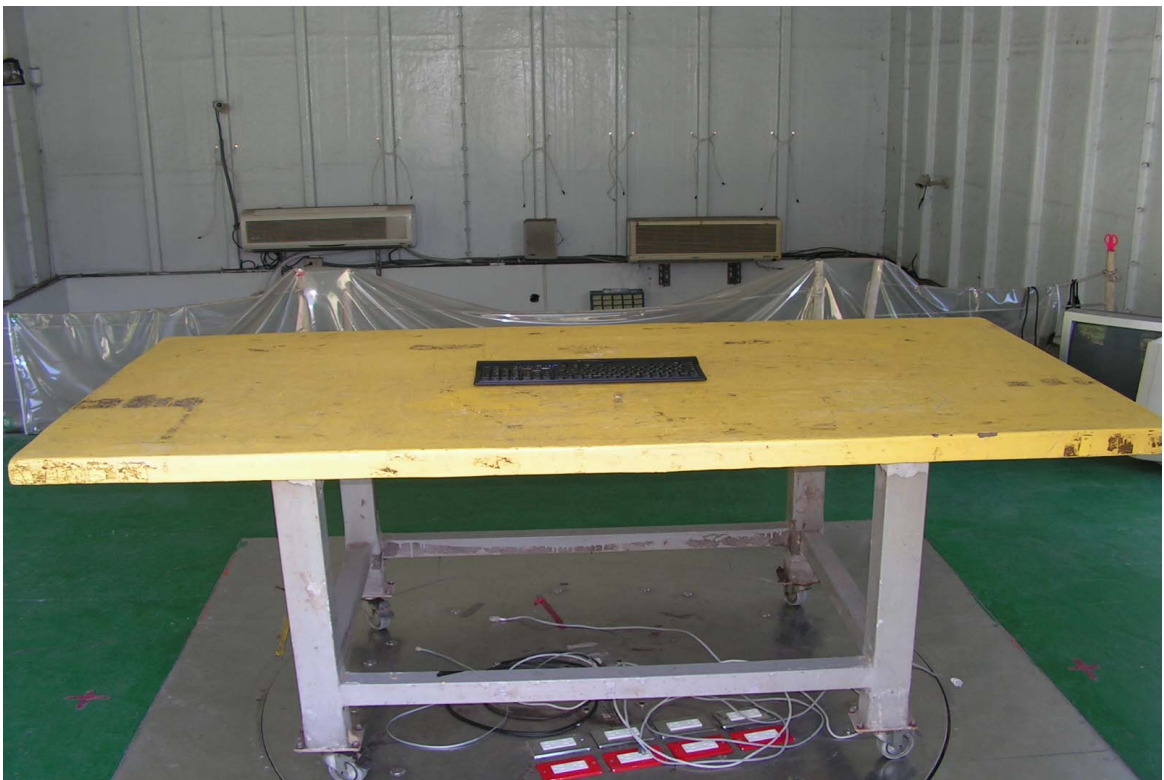


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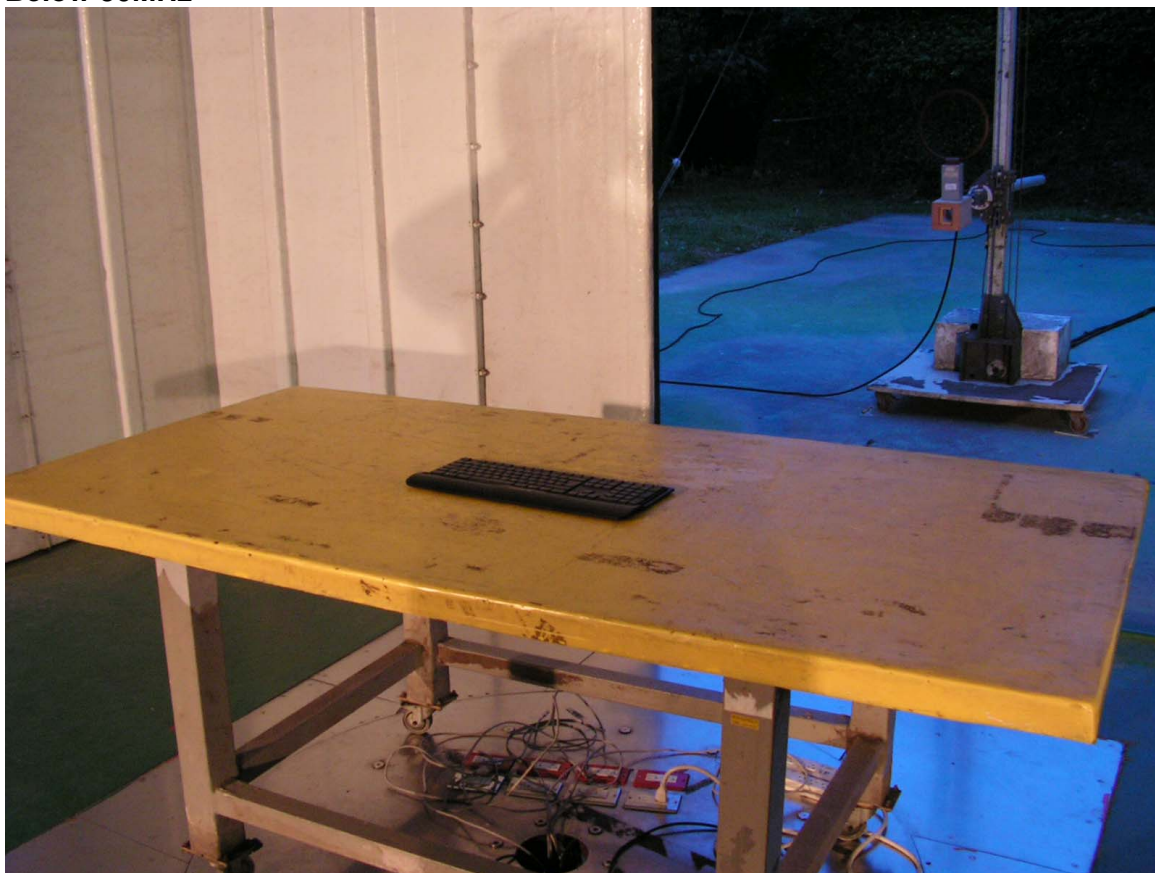
5. PHOTOGRAPHS FOR TEST

5.1 TEST PHOTOGRAPHS FOR RADIATION

30-1000MHz



Below 30MHz



6. PHOTOGRAPHS FOR PRODUCT

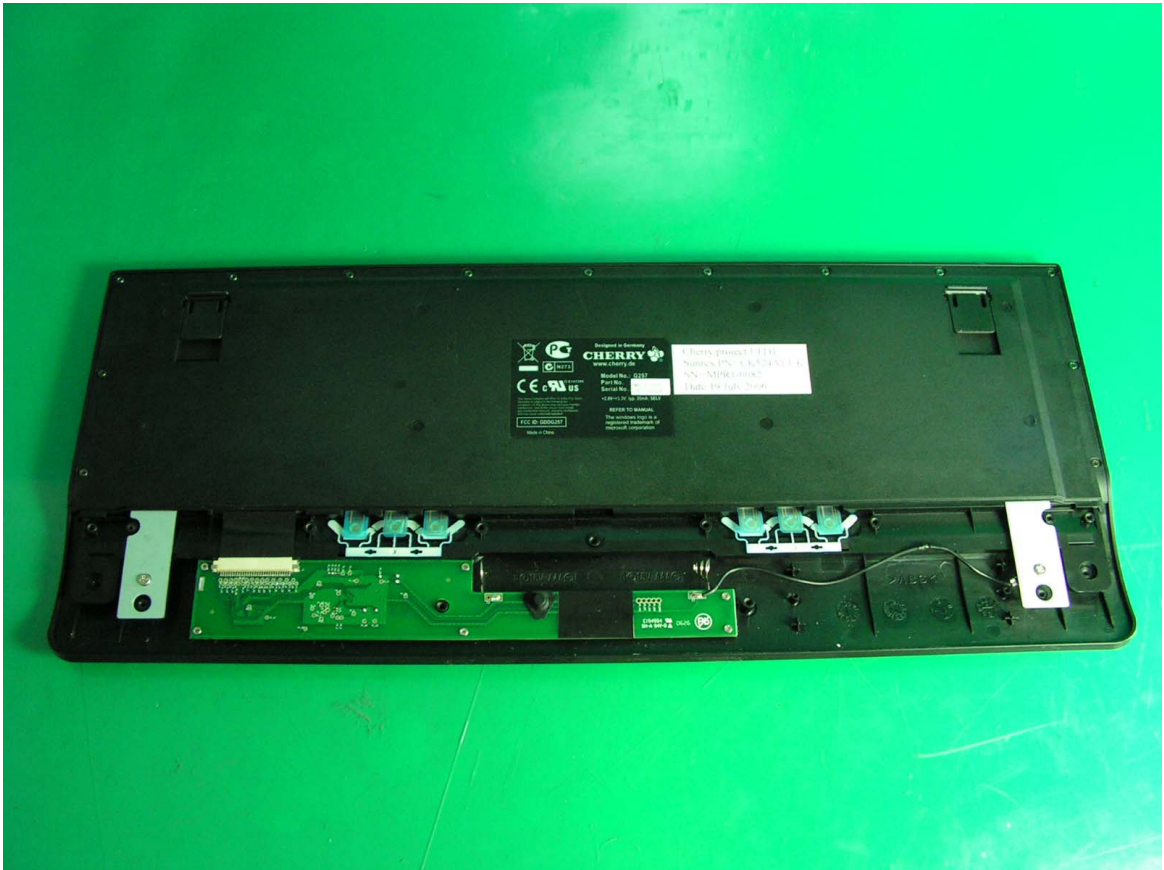
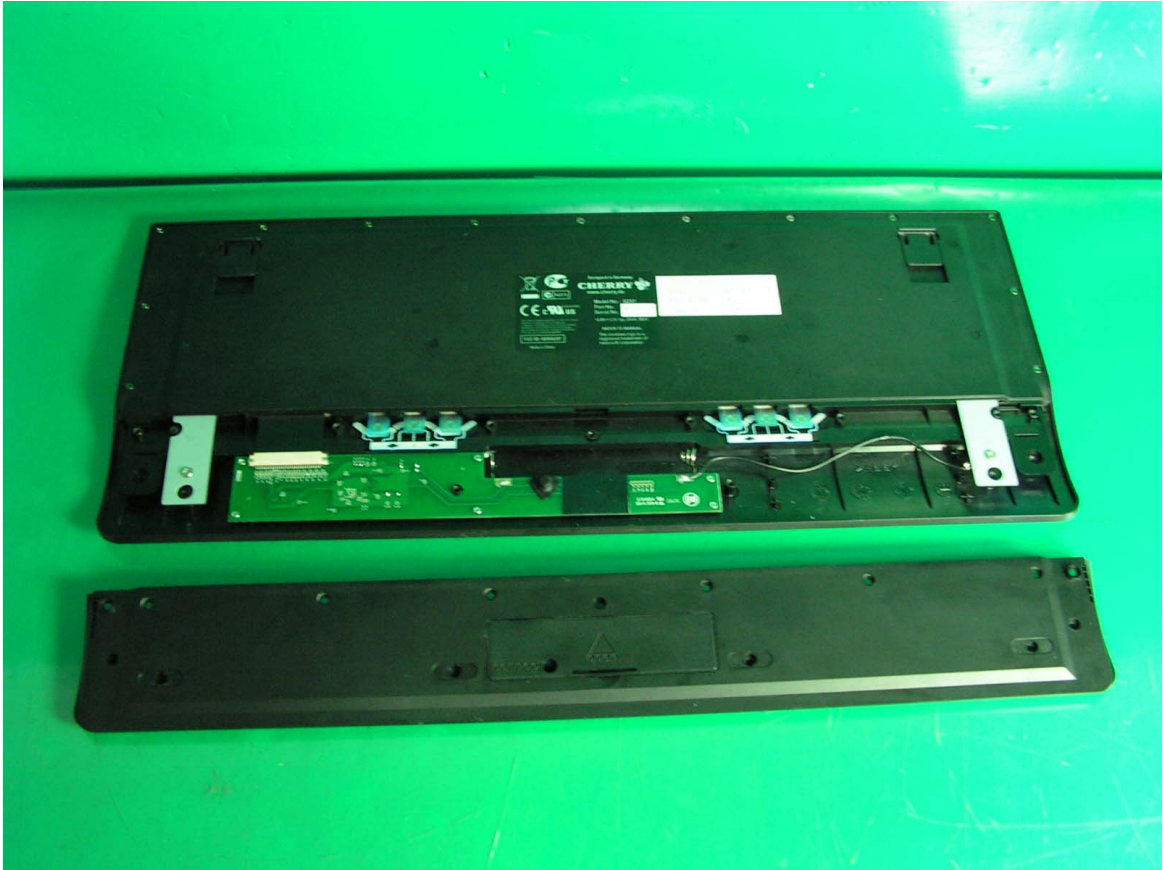
1. Front Side
2. Front Side



- 3. Front Side
- 4. Rear Side

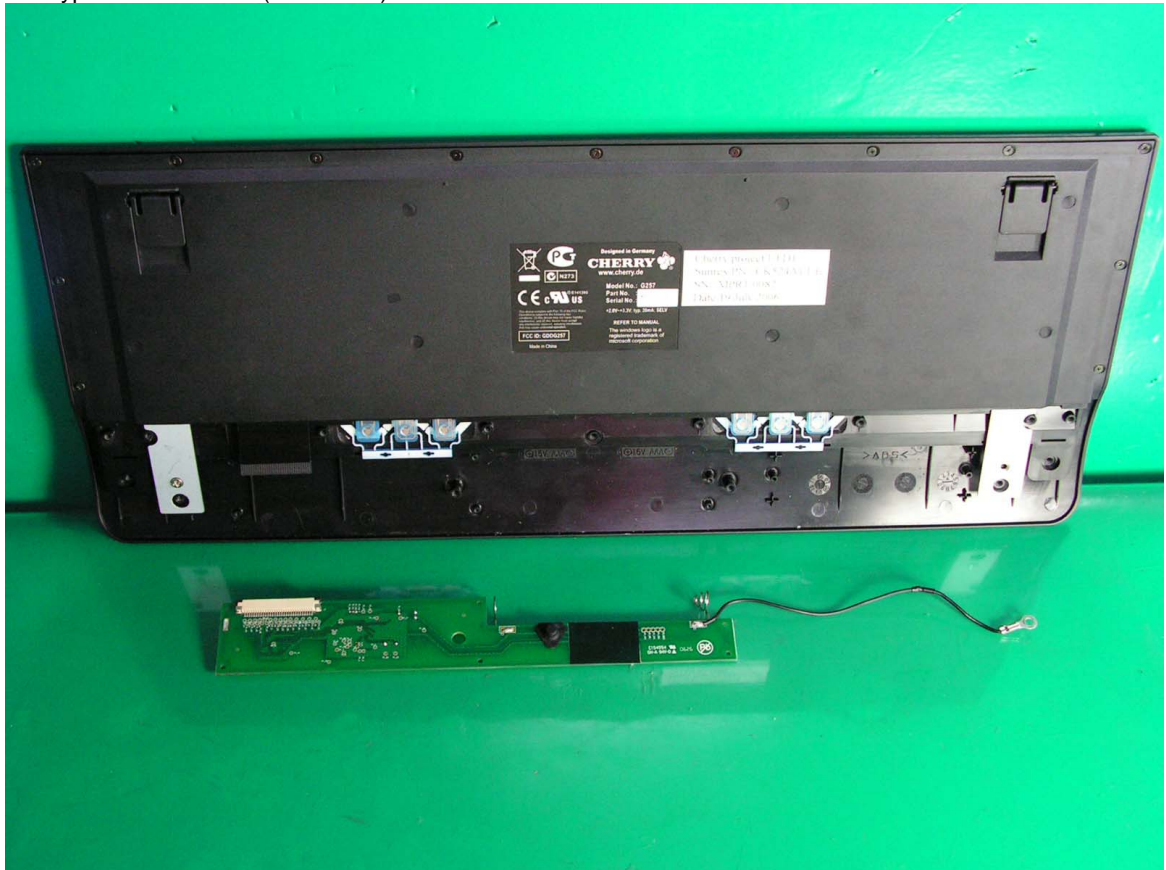


- 5. Remove RF MB Cover
- 6. RF MB Location



7. RF MB Out of Cover

8. Keypad Out of Cover (Front Side)



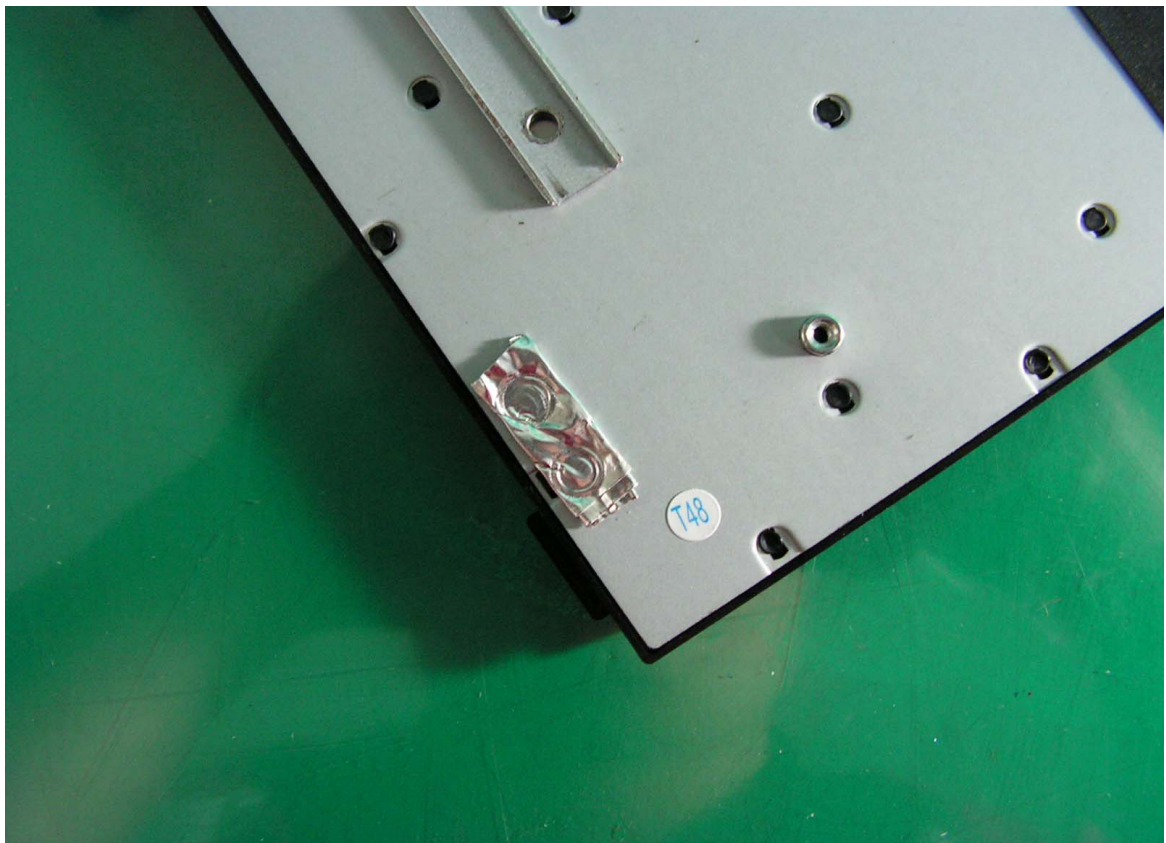
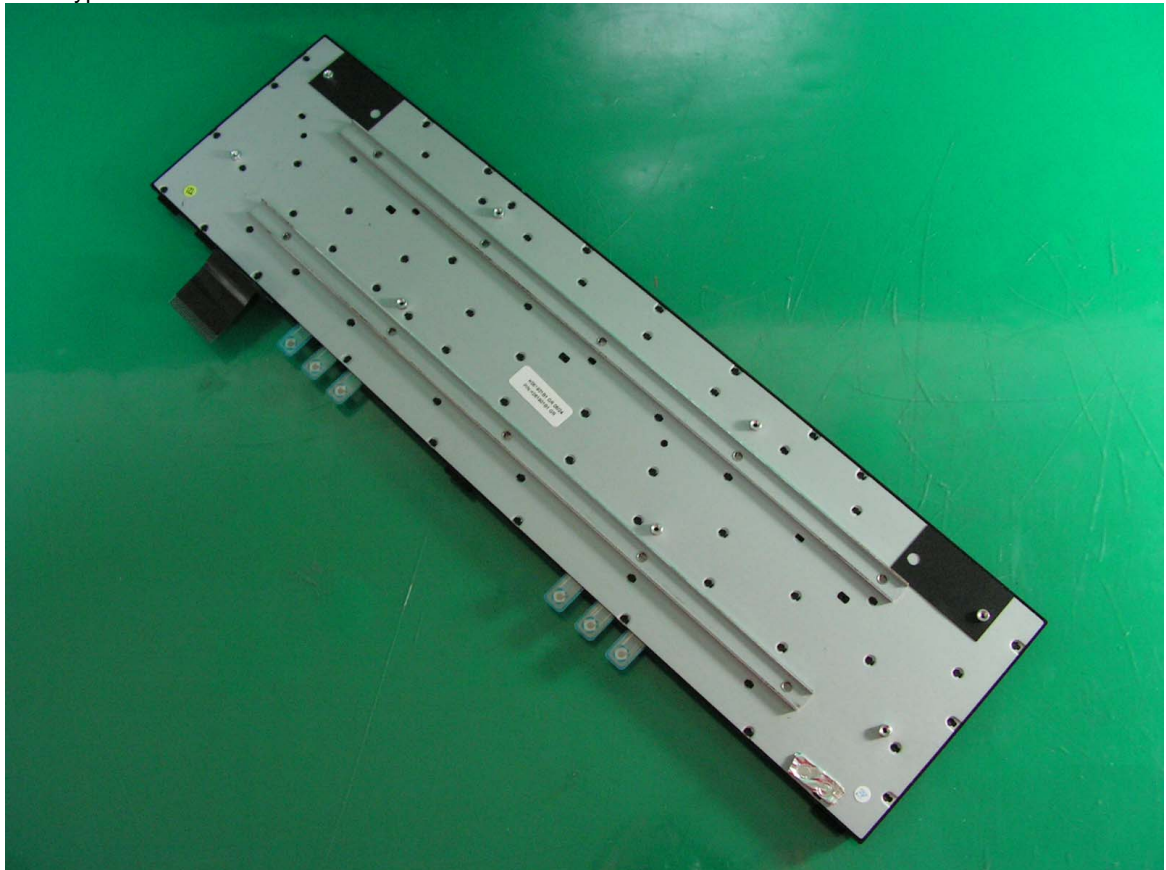
9. Keypad Out of Cover (Rear Side)

10. Keypad Front Side



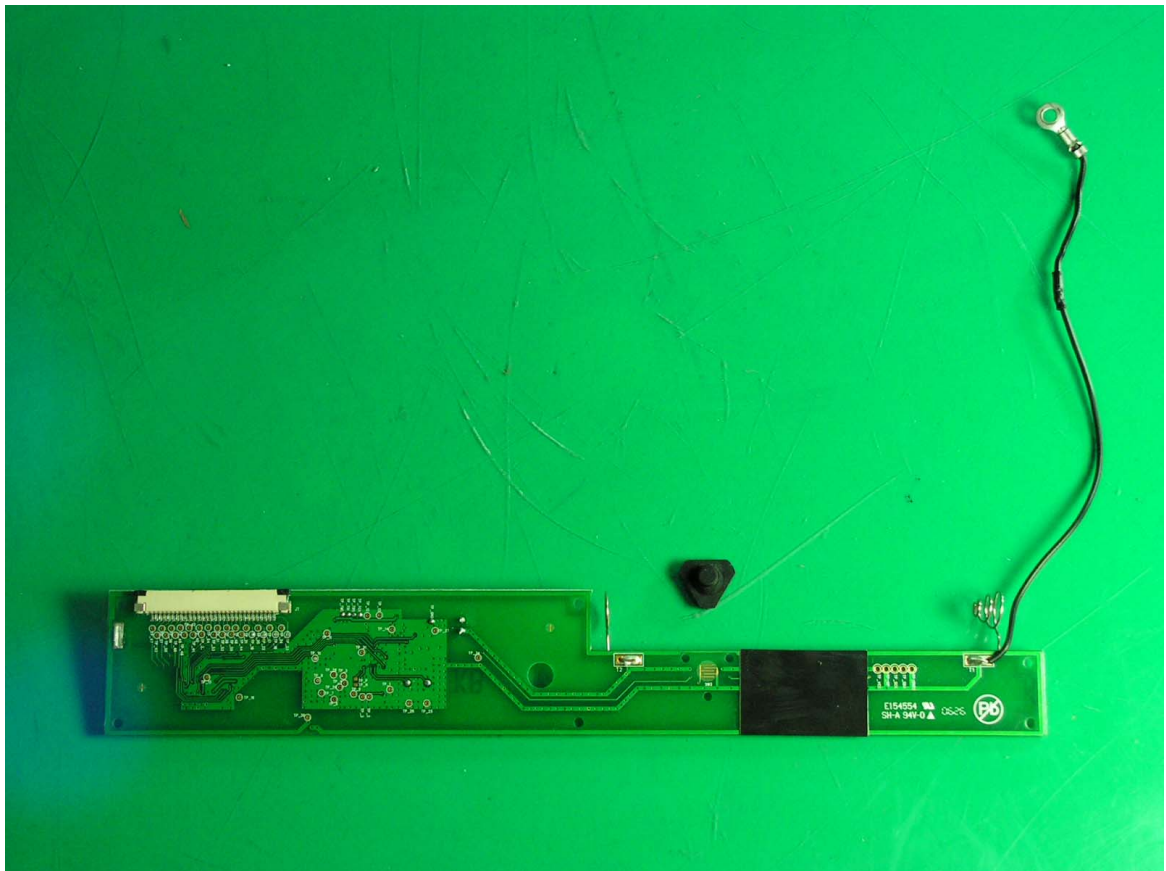
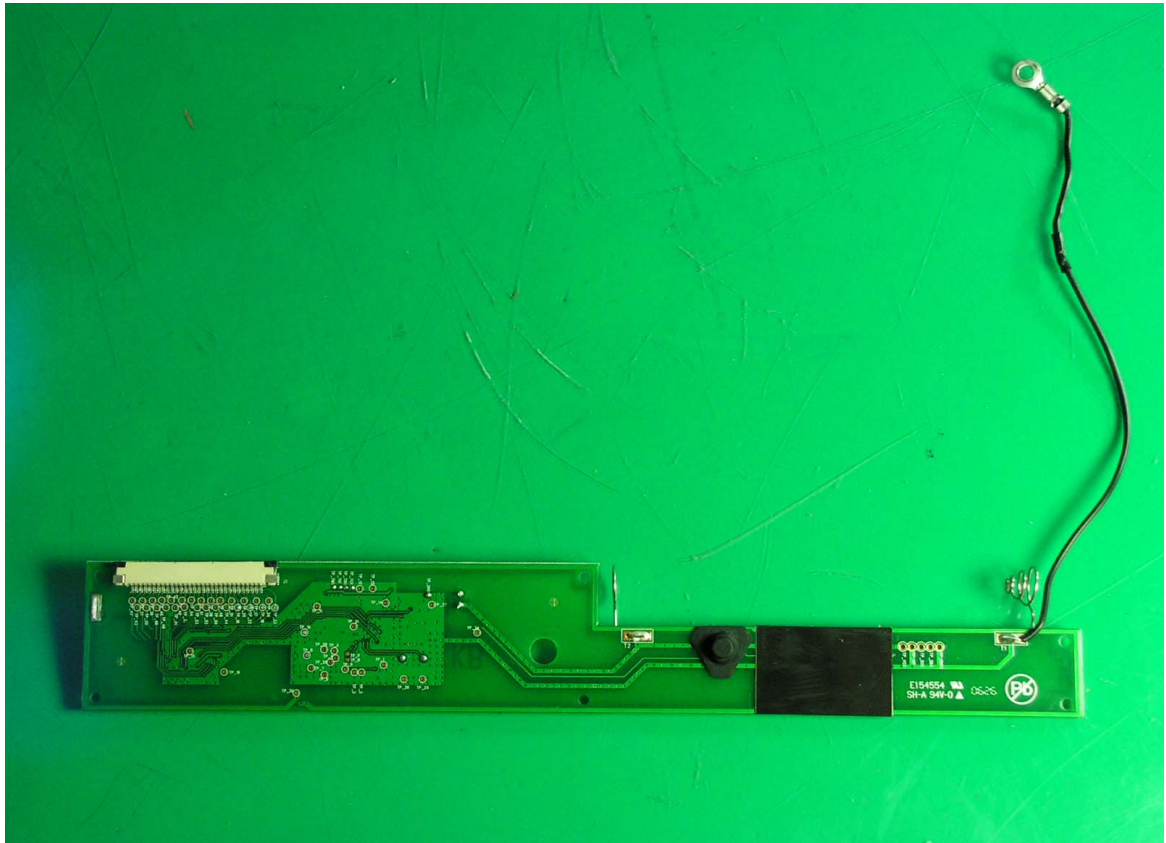
11. Keypad Rear Side

12. Keypad Rear Side



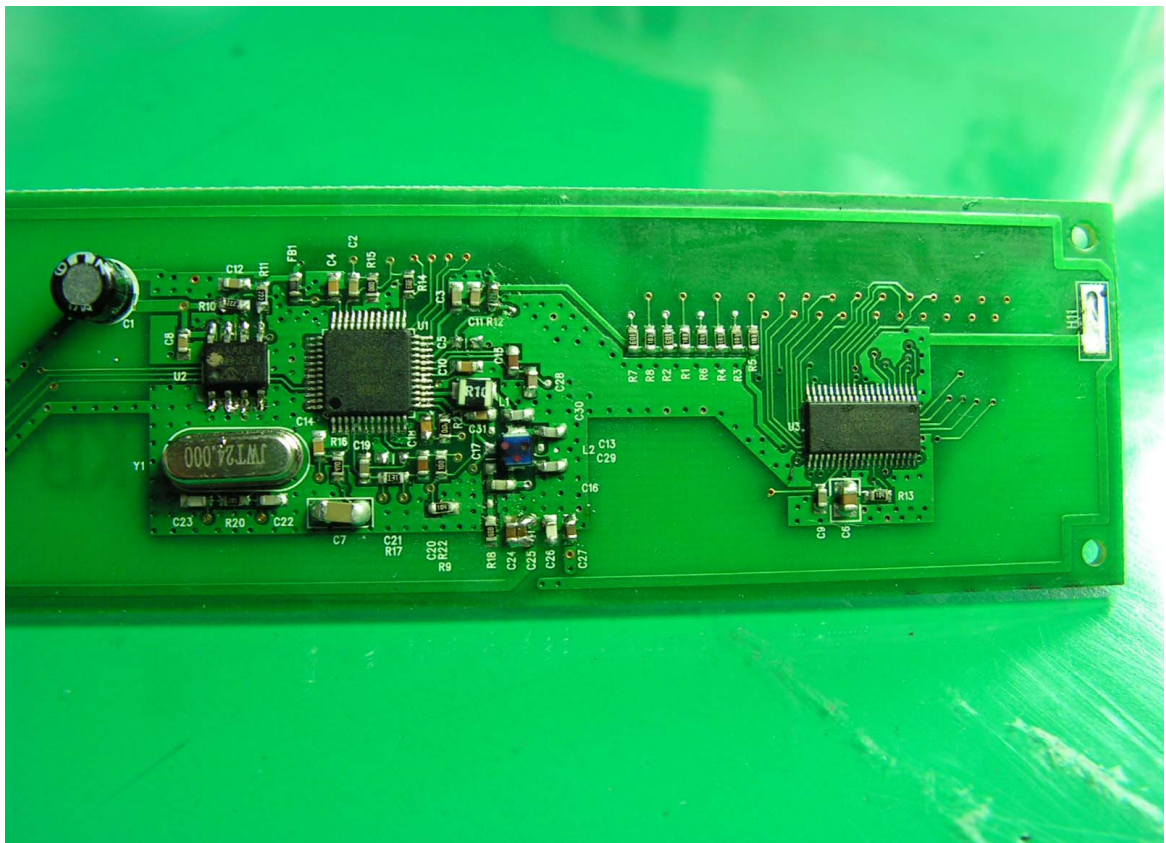
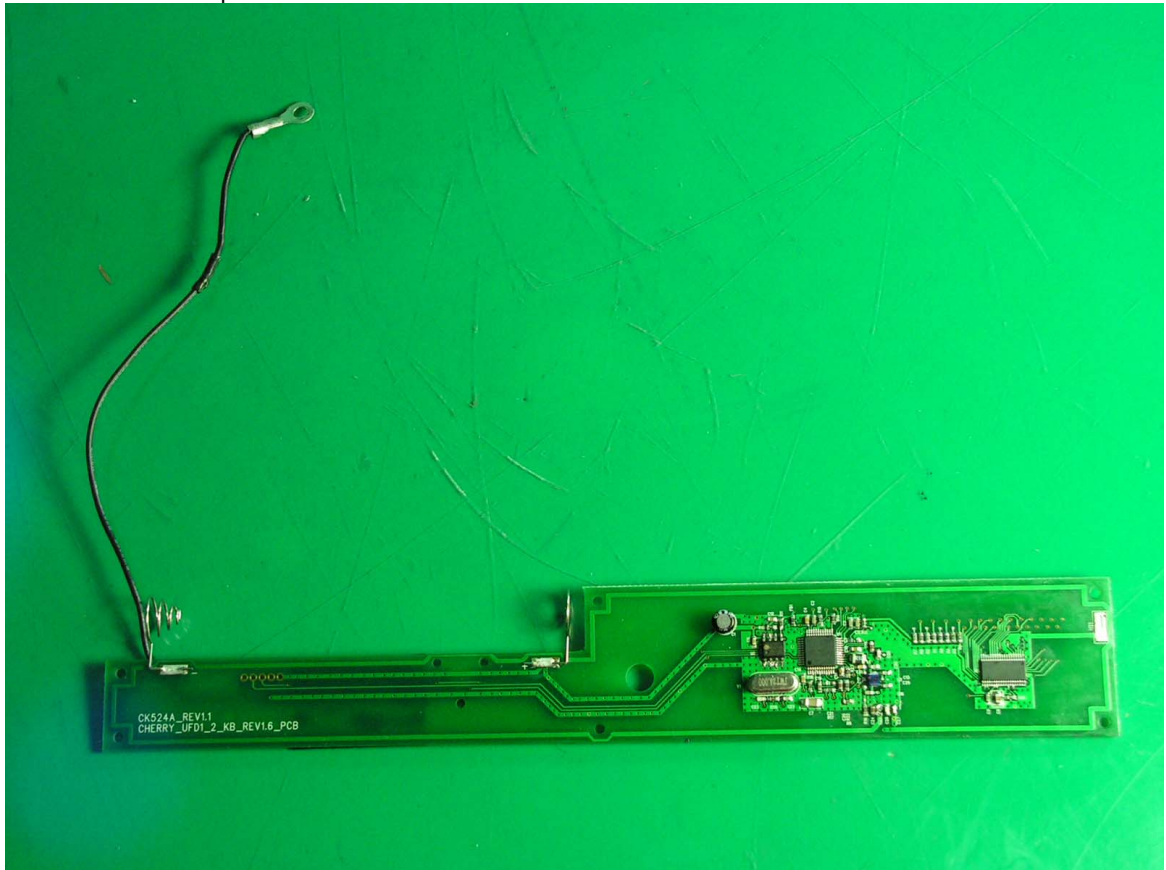
13. RF MB Front Side

14. RF MB Front Side Remove Connect Button Rubber Pad



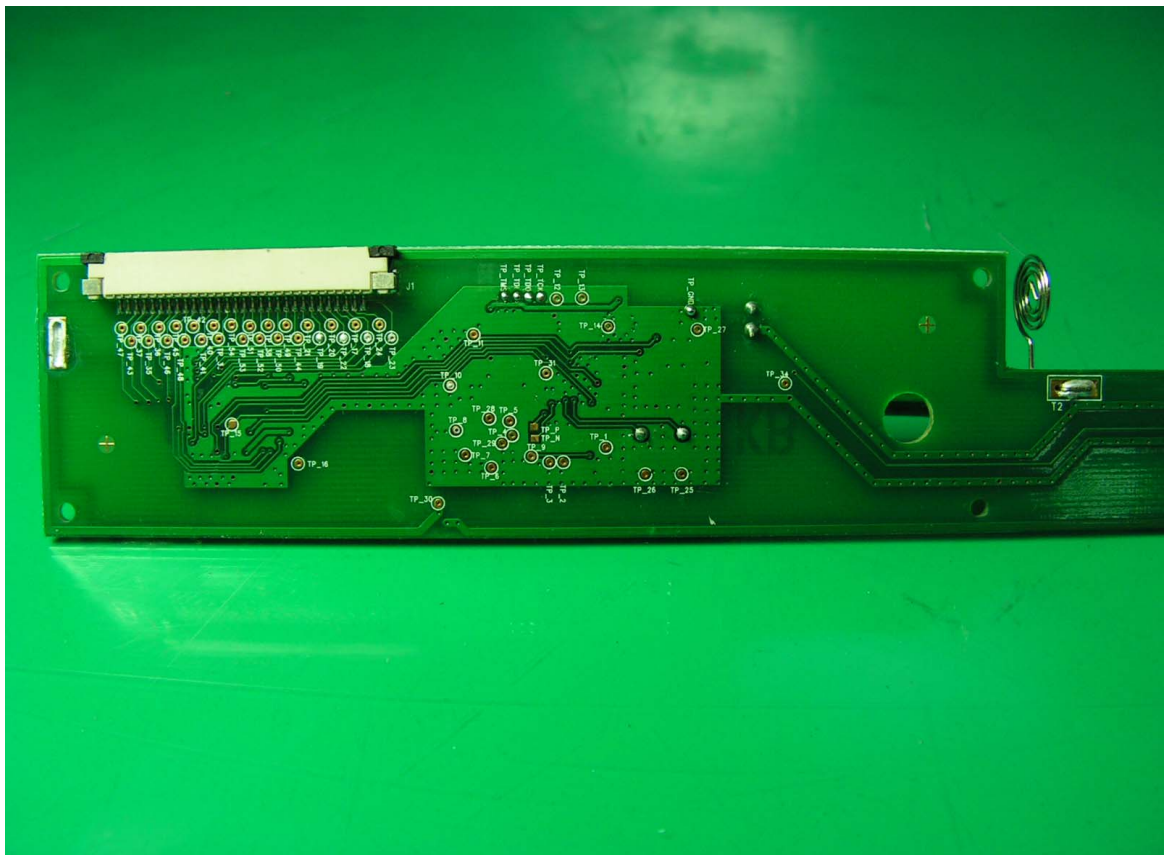
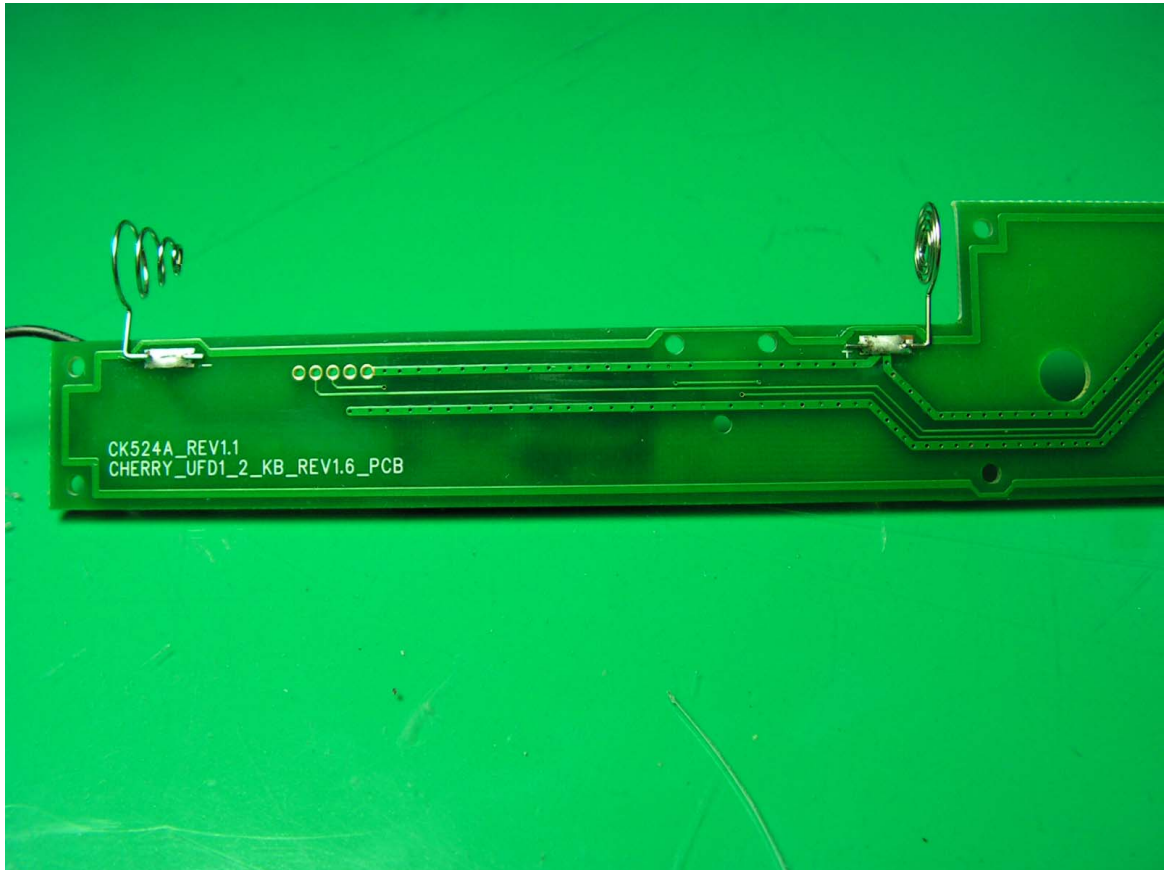
15. RF MB Rear Side

16. RF MB Main Chips Close On

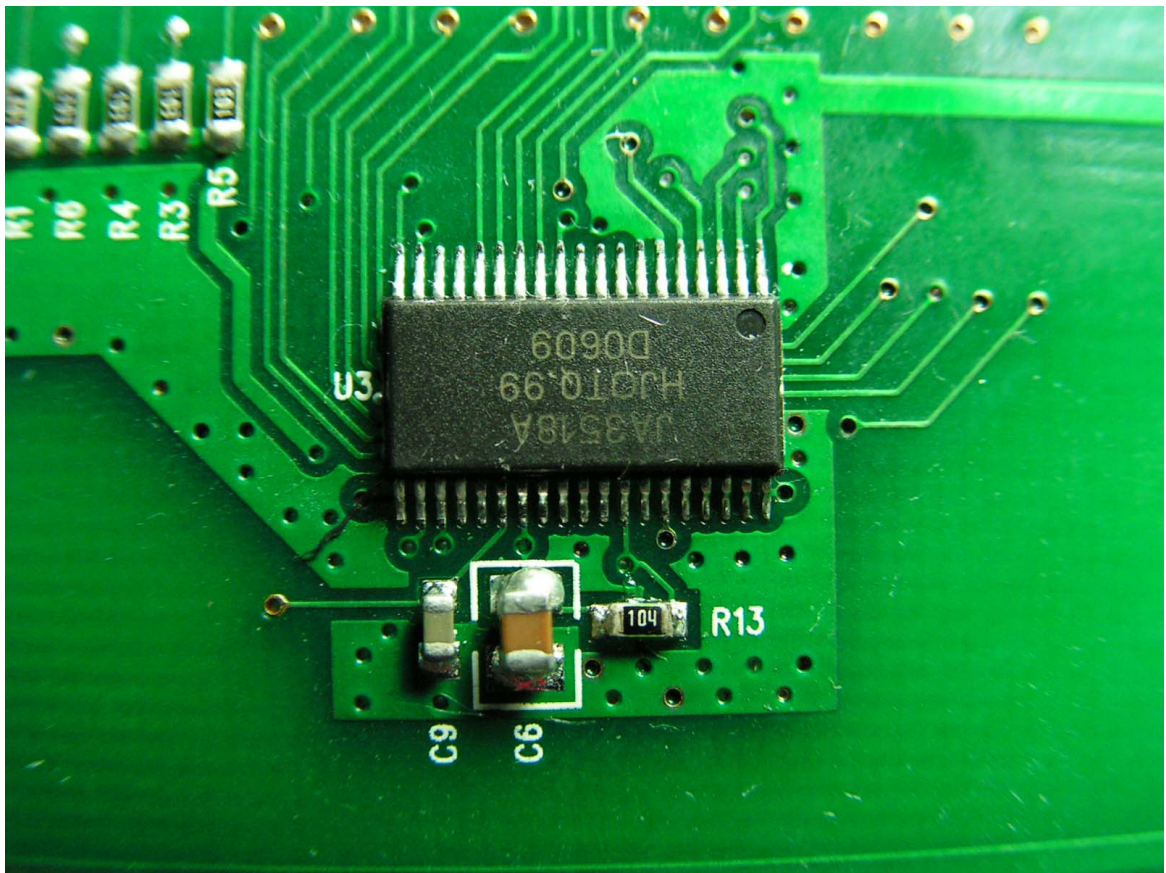
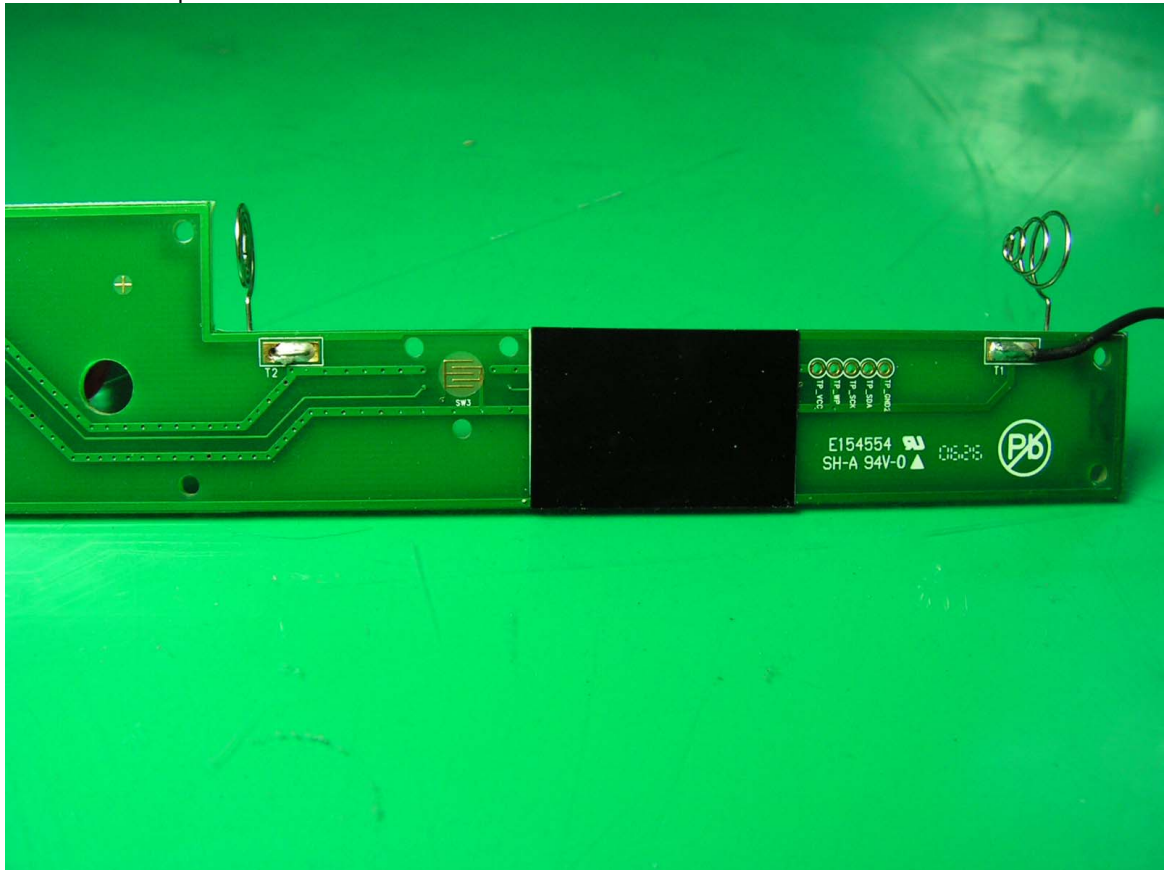


17. RF MB Rear Side Part 2 (For Trace)

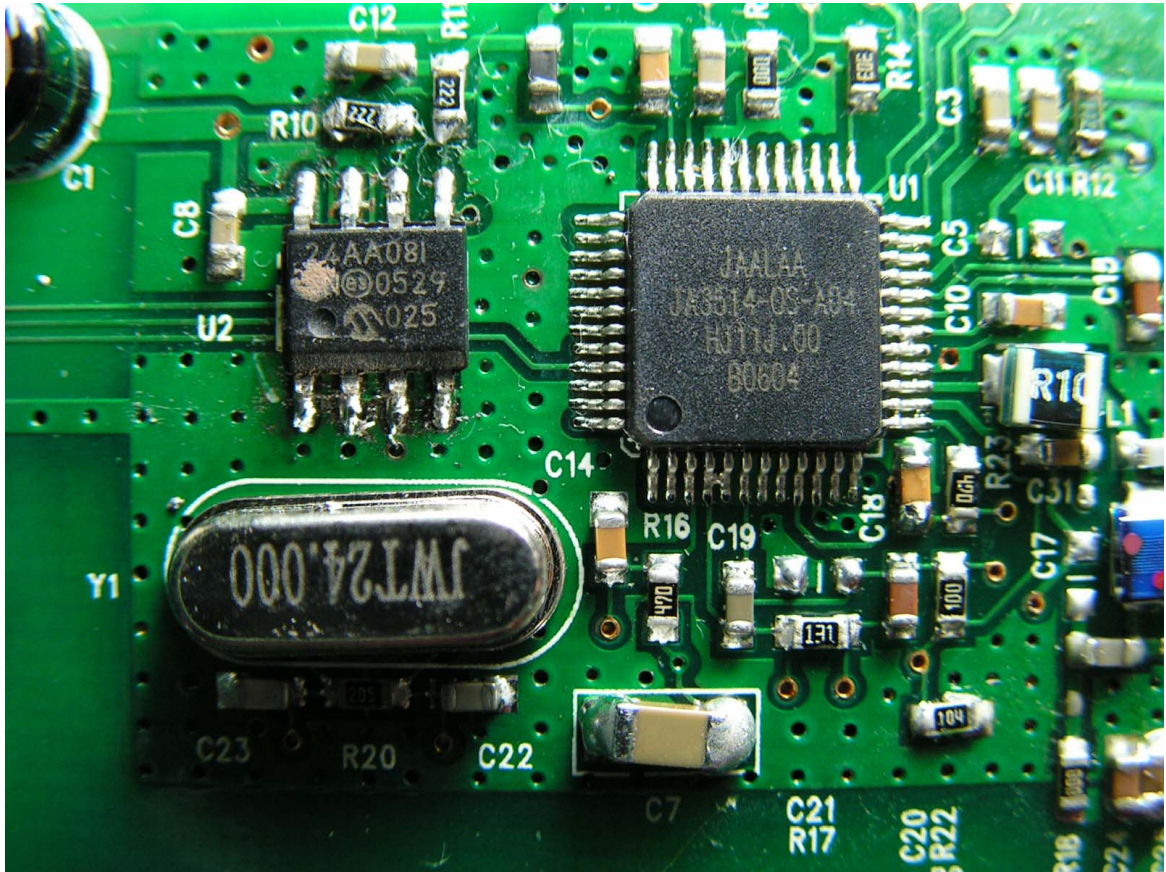
18. RF MB Front Side Panel Connector Close On



- 19. RF MB Front Side Close On Part 2
- 20. RF Main Chip Close On Part 1



- 21. RF Main Chip Close On Part 2
- 22. Label Here



7. EMI REDUCTION METHOD DURING COMPLIANCE TESTING

No modification was made during testing.

Appendix A

Circuit (Block) Diagram

(Shall be added by Applicant)

Appendix B

User Manual

(Shall be added by Applicant)