

Certificate of Test

November 2004

ORtek Technology Inc.

Product Type : Wireless Mobile Mini Keypad
Model Number : WKP-100 ; AKP01
Test Report Number : GTK-0410106
Date of Test : November 02, 2004- November 03, 2004

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 B Paragraph 15.227
ANSI C63.4: 2001

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



Sharon Chang, President

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Date: November 04, 2004



1082
ILAC MRA





ORtek Technology Inc.

EUT:
Wireless Mobile Mini Keypad

Model Number:
WKP-100 ; AKP01

FCC ID:
GM8WKP100

Prepared for:

ORtek Technology Inc.

13F, Number 150, Jian Yi Rd. Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

Report By :Global EMC Standard Tech. Corp.

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3. The report must not be used by the client to claim product certification, approval, or endorsement by any agency of the federal government.
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1. CERTIFICATION

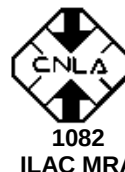
Applicant : ORtek Technology Inc.

EUT Description : [Wireless Mobile Mini Keypad](#)
Model Number : [WKP-100 ; AKP01](#)
Serial Number : [N/A](#)
Brand Name : [ORtek](#)
FCC ID : [GM8WKP100](#)
Tested Power Supply : [120V/60Hz](#)
Manufacturer : ORtek Technology Inc.
Address : 13F, Number 150, Jian Yi Rd. Chung Ho City, Taipei Hsien,
Taiwan, R.O.C.

MEASUREMENT PROCEDURES USED:

- ☒ **CFR 47, Part 15** Radio Frequency Device Subpart C Intentional Radiators :2003
- ☒ **ANSI C63.4** Methods of Measurements of Radio-Noise Emissions from Low- Voltage
Electrical and Electronic Equipment in the range of 9kHz To 40GHz.
2001

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.

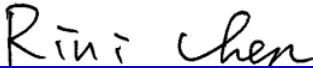


Sample Received Date : **November 02, 2004**

Final Test Date : **November 03, 2004**

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 / adm. Dept. Supervisor

Test By :


John Wu / eng. Dept. Engineer

Technical Reviewed By:


Shine Chang / eng. Dept. Supervisor

Approved By :


Tony Lin / General Manager

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 Mobile Mini Keypad
Model Number	: WKP-100 ; AKP01
Serial Number	: N/A
Brand Name	: ORtek
FCC ID	: GM8WKP100
Modulation Type	: FSK
Antenna Type	: Loop
Frequencg Range	: 27.095 MHz
Channel Number	1 Channel
Channel Control	N/A
Working Voltage	: Battery DC 3V

Frequency of Each Channel:

Channel	Frequency (MHz)
1	27.095

Note:

1. This device is a 27.095MHz Wireless Mobile Mini Keypad included transmitter and receiver.
2. This device is one channel and perform the test, then record on this report.
3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.227
4. The device is a transmitter equipement to accordance with Part 15 regulations. The function receiving was under Declaration of Conformity and record of measurment in test report that the report number is 0410106FCC DOC.
5. AKP01 is multiple listing model number.

2.2 OPERATIONAL DESCRIPTION

This device is Wireless Mobile Mini Keypad included wireless transmitter of keypad and receiver ,

The powered by DC 3V batteryys.

This device only one channel and operation in 27.095MHz with FSK modulation.

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

Another information please refer to users manual.

2.3 TEST MODES & EUT COMPONENTS DESCRIPTION

EUT: Wireless Mobile Mini Keypad, M/N: WKP-100 ; AKP01	
Test Mode	Mode 1
Frequency	27.095MHz

2.4 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:

Non test equipment

2.5 TEST FACILITY

Ambient conditions in the laboratory:

ITEMS	REQIORED(IEC 68-1)	ACTUAL
TEMPERATURE (°C)	15-35	24-27
HUMIDITY (%RH)	25-75	50-65
BAROMETRIC PRESSURE (mbar)	860-1060	950-1000
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 States Department of commerce National Institute of Standards and Technology National Voluntary Laboratory Accreditation Program Accreditation on NVLAP effective through Sep. 30,2005 For CISPR 22, FCC Method and AS/NZS 3548 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.	

2.6 TEST SETUP

EUT:

Wireless Mobile Mini Keypad



2.7 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

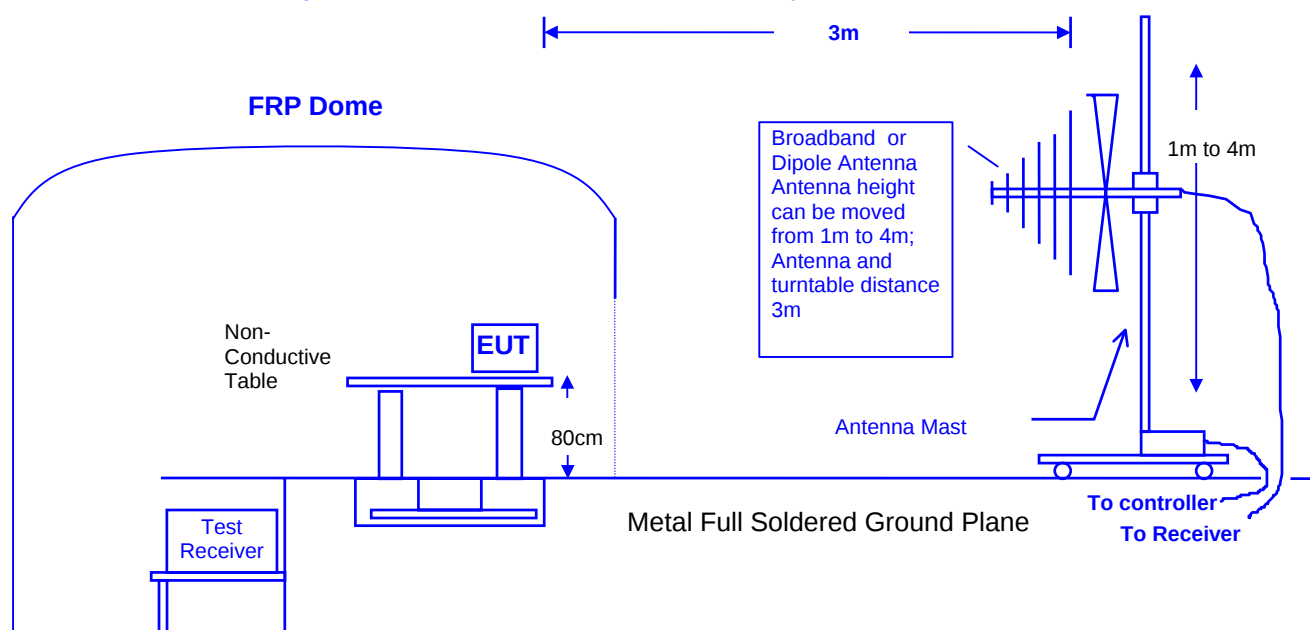
Item	Instrument	Manufacturer	Model	Serial No.	Last Cal.
1	Test Receiver	Rohde & Schwarz	ESVS30	829007/014	12/13/03
2	Spectrum Analyzer	Rohde & Schwarz	FSP40	100061	03/16/04
3	Spectrum Analyzer	HP	E4407B	39240339	07/28/04
4	Power Meter	Rohde & Schwarz	NRVS	100666	04/29/04
5	Peak Power Sensor	Rohde & Schwarz	NRV-Z32	8360191058	04/29/04
6	Bilog Antenna	SCHAFFNER	CBL6112B	2620	12/01/03
7	Loop Antenna	EMCO	6509	9601-1389	04/05/03
8	Loop Antenna	EMCO	6507	9510-1353	04/03/25
9	RF Cable	GesTek	N/A	GTK-E-A151-01	02/09/04
10	Open Site	GesTek	N/A	B1	11/25/03
11	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

Note: This is a comprehensive setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



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 measeurement 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

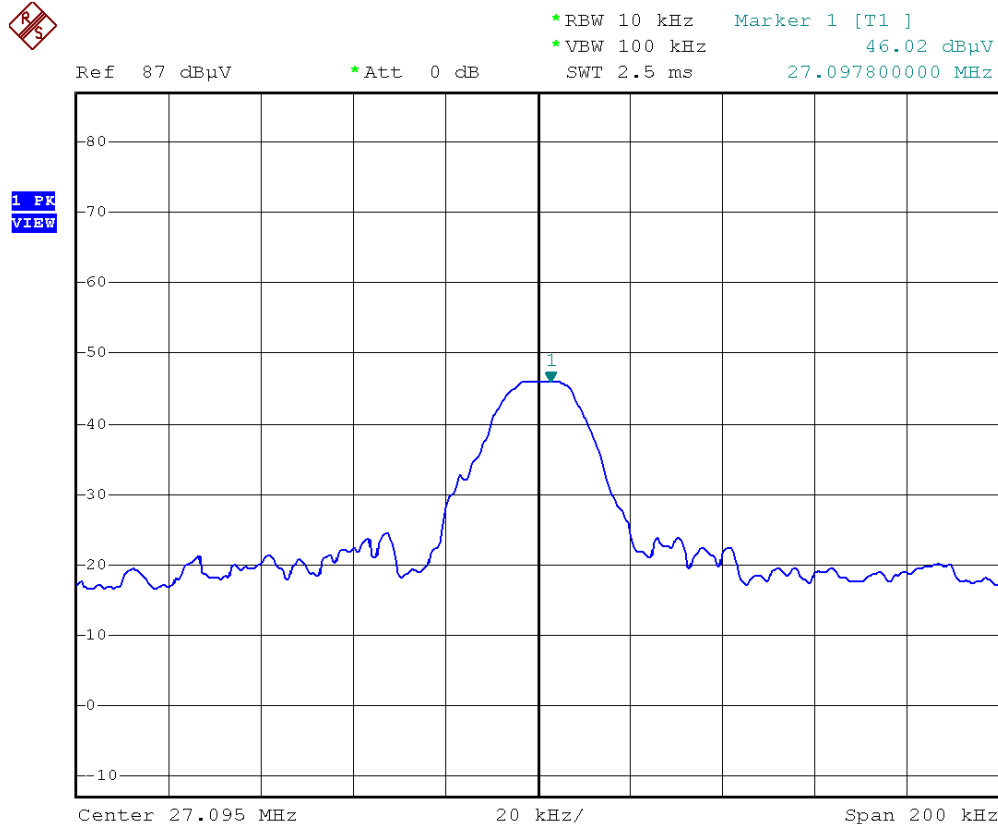
Date of Test	November 02, 2004	Temperature	26 deg/C
EUT	Wireless Mobile Mini Keypad	Humidity	56 %RH
Working Cond.	Channel 1		
Antenna distance	3m		

Peak

No.	Frequency [MHz]	Reading Level [dB(uV/m)]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1	27.0978	46.02	14.47	60.49	100	-39.51

Remark

1. The Readings are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=10kHz, VBW=100kHz.
3. Spectrum Analyzer Setting(AVG Detector): RBW=10kHz, VBW=10HZ.
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.



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3.7.2 BAND EDGE RESULT

Date of Test	November 02, 2004	Temperature	26 deg/C
EUT	Wireless Mobile Mini Keypad	Humidity	56 %RH
Working Cond.	Channel 1		
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	18.21	14.47	32.68
2	27.28	18.38	14.47	32.85
3	26.54	22.52	14.47	36.99
4	27.37	20.17	14.47	34.64

Radiation Emission @ 30 meter

No.	Frequency [MHz]	Emission Level [dBuV/m]	Limit [dBuV/m]	Margin [dB]
1	26.96	-7.32	29.5	-36.82
2	27.28	-7.15	29.5	-36.65
3	26.54	-3.01	29.5	-32.51
4	27.37	-5.36	29.5	-34.86

Remark

1. The Readings are peak or average.
2. Spectrum Analyzer Setting(Peak Detector): RBW=10kHz, VBW=100kHz.
3. Spectrum Analyzer Setting(AVG Detector): RBW=10kHz, VBW=10HZ.
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.
The measurement distance is 30 meter for 1.703MHz – 30MHz band which required in 15.209. When performing
- 8 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).

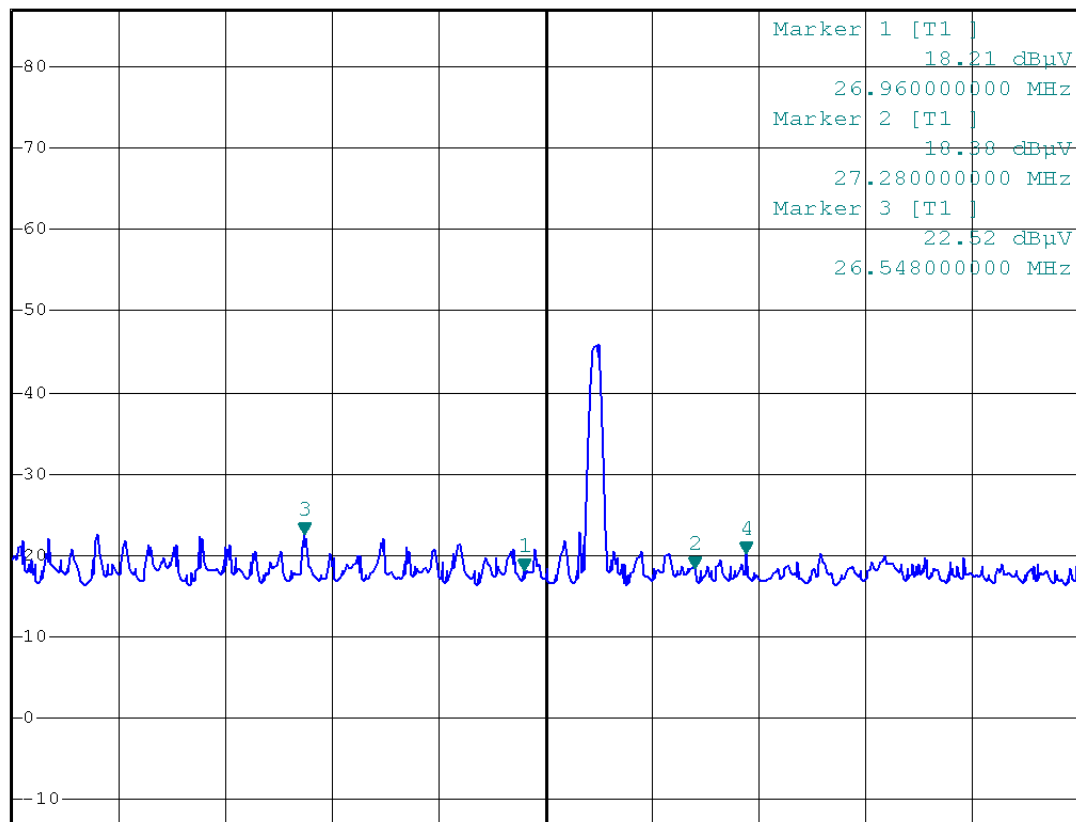


*RBW 10 kHz Marker 4 [T1]
 *VBW 100 kHz 20.17 dBμV
 *SWT 500 ms 27.376000000 MHz

Ref 87 dBμV

*Att 0 dB

1 PK
VIEW



Start 26 MHz

200 kHz/

Stop 28 MHz

Date: 2.NOV.2004 18:36:51

3.7.3 HARMONIC RADIATED EMISSIONS

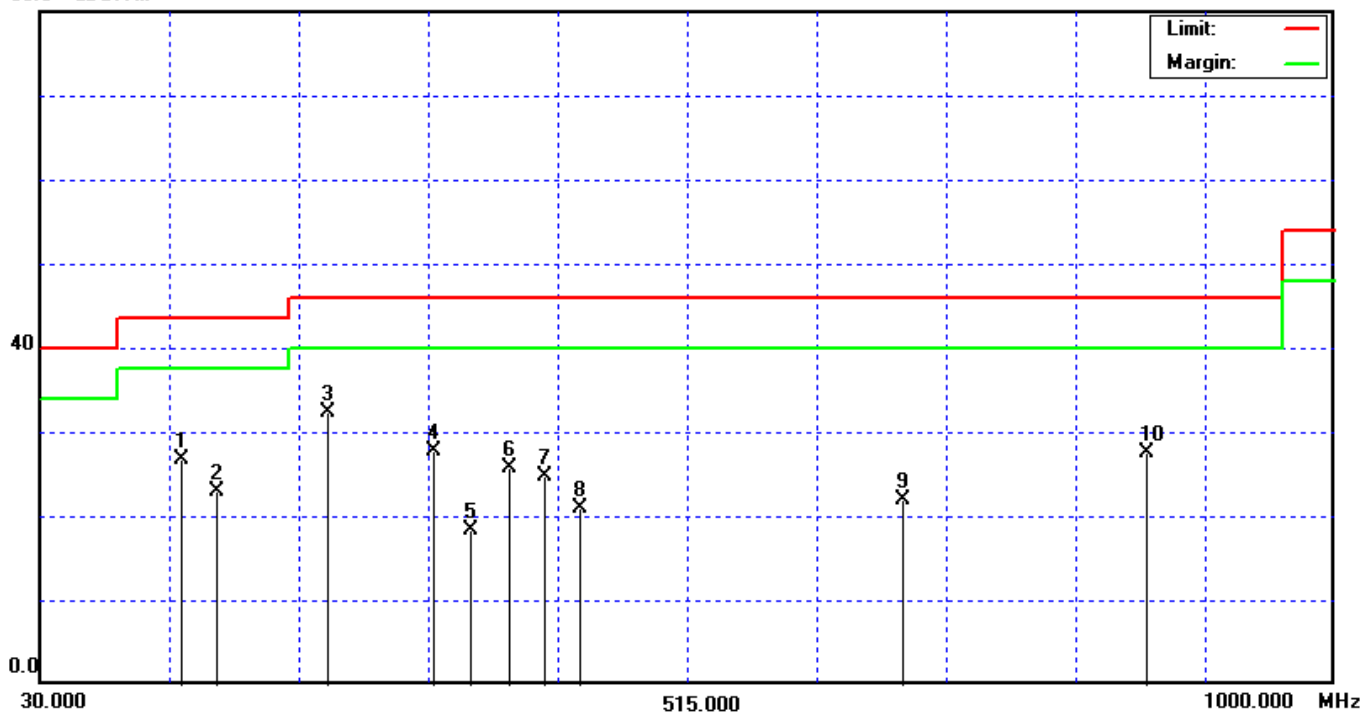
Date of Test	November 03, 2004	Temperature	22 deg/C
EUT	Wireless Mobile Mini Keypad	Humidity	62 %RH
Working Cond.	Channel 1	Display Pattern	H Pattern
Antenna distance	3m at Horizontal	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBuV/m	Factor dB	Measurement dBuV/m	Limit dBuV/m	Over Limit dB	Detector
1	135.327	38.2	-11.59	26.61	43.5	-16.89	QP
2	162.265	36	-13.12	22.88	43.5	-20.62	QP
3	243.405	42.5	-10.22	32.28	46	-13.72	QP
4	324.545	34.4	-6.78	27.62	46	-18.38	QP
5	351.992	24.4	-6.09	18.31	46	-27.69	QP
6	379.285	30.9	-5.22	25.68	46	-20.32	QP
7	406.38	29.5	-4.74	24.76	46	-21.24	QP
8	433.469	25.4	-4.51	20.89	46	-25.11	QP
9	677.375	22.6	-0.68	21.92	46	-24.08	QP
10	857.957	24.9	2.69	27.59	46	-18.41	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Emission Level= 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



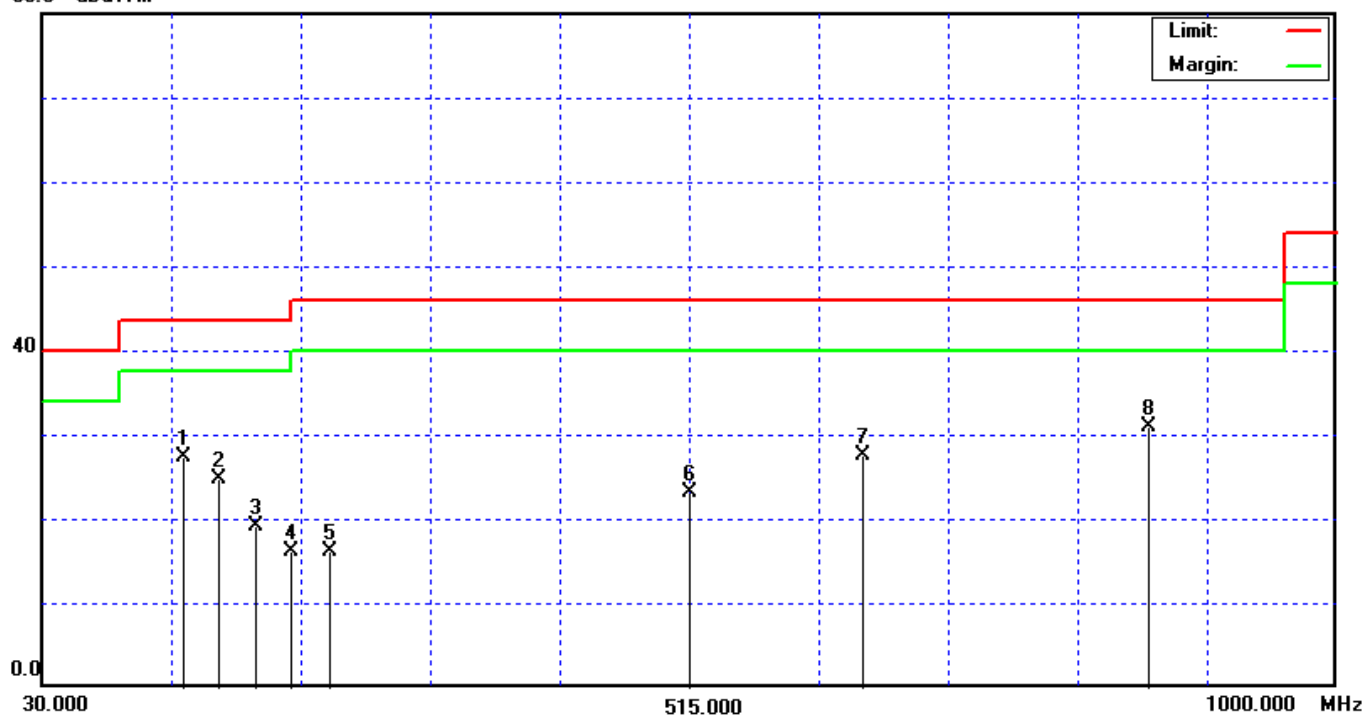
Date of Test	November 03, 2004	Temperature	22 deg/C
EUT	Wireless Mobile Mini Keypad	Humidity	62 %RH
Working Cond.	Channel 1	Display Pattern	H Pattern
Antenna distance	3m at Vertical	Frequency Range	30-1000MHz

No.	Frequency MHz	Reading Level dBuV/m	Factor dB	Measurement dBuV/m	Limit dBuV/m	Over Limit dB	Detector
1	134.997	38.9	-11.59	27.31	43.5	-16.19	QP
2	162.092	37.9	-13.12	24.78	43.5	-18.72	QP
3	189.187	32.2	-13.06	19.14	43.5	-24.36	QP
4	216.282	27.5	-11.44	16.06	46	-29.94	QP
5	243.855	26.3	-10.19	16.11	46	-29.89	QP
6	514.832	26.3	-3.21	23.09	46	-22.91	QP
7	643.93	28.5	-1.05	27.45	46	-18.55	QP
8	858	28.2	2.69	30.89	46	-15.11	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Emission Level= 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.

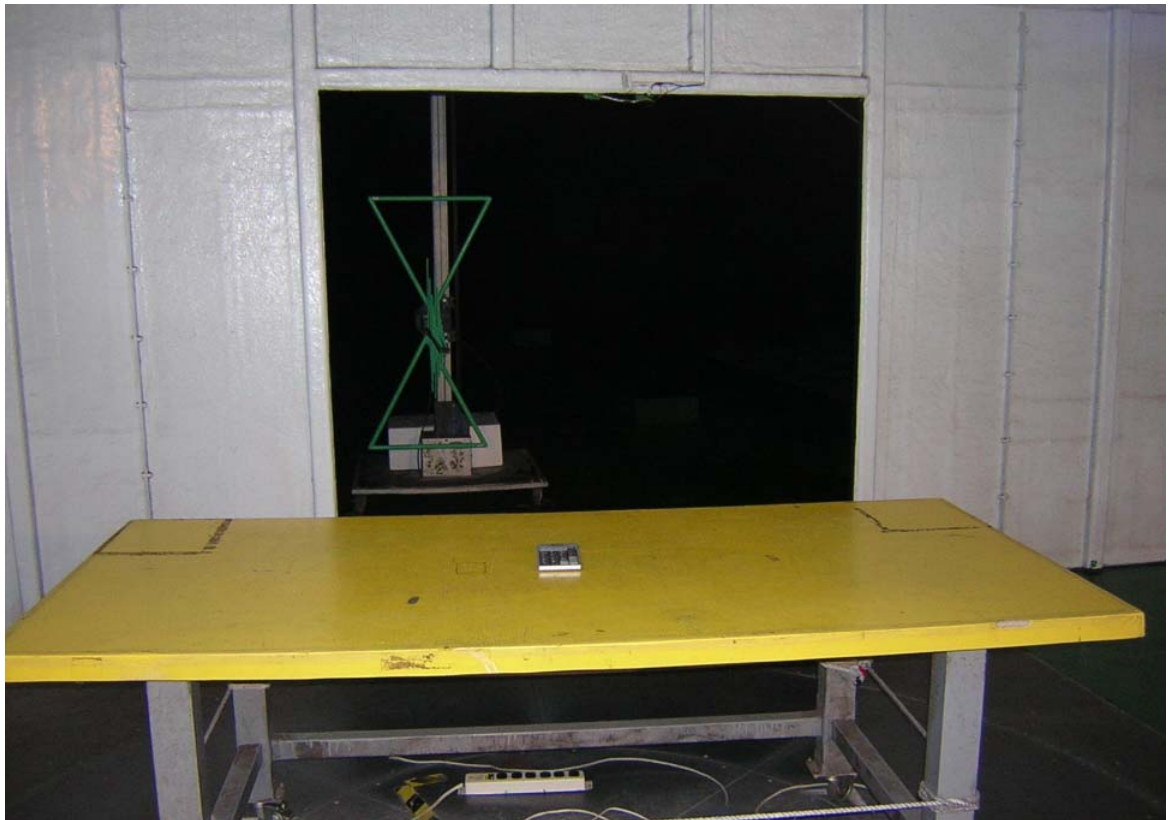
80.0 dBuV/m



4. PHOTOGRAPHS FOR TEST

4.1 TEST PHOTOGRAPHS FOR RADIATION

30-1000MHz



Below 30MHz

5. PHOTOGRAPHS FOR PRODUCT

1. Front View Of Wireless Mobile Mini Keypad (EUT)
2. Back View Of Wireless Mobile Mini Keypad (EUT)



3. LABEL HERE



4. Front View Of Wireless Mobile Mini Keypad (EUT)
5. Back View Of Wireless Mobile Mini Keypad (EUT)

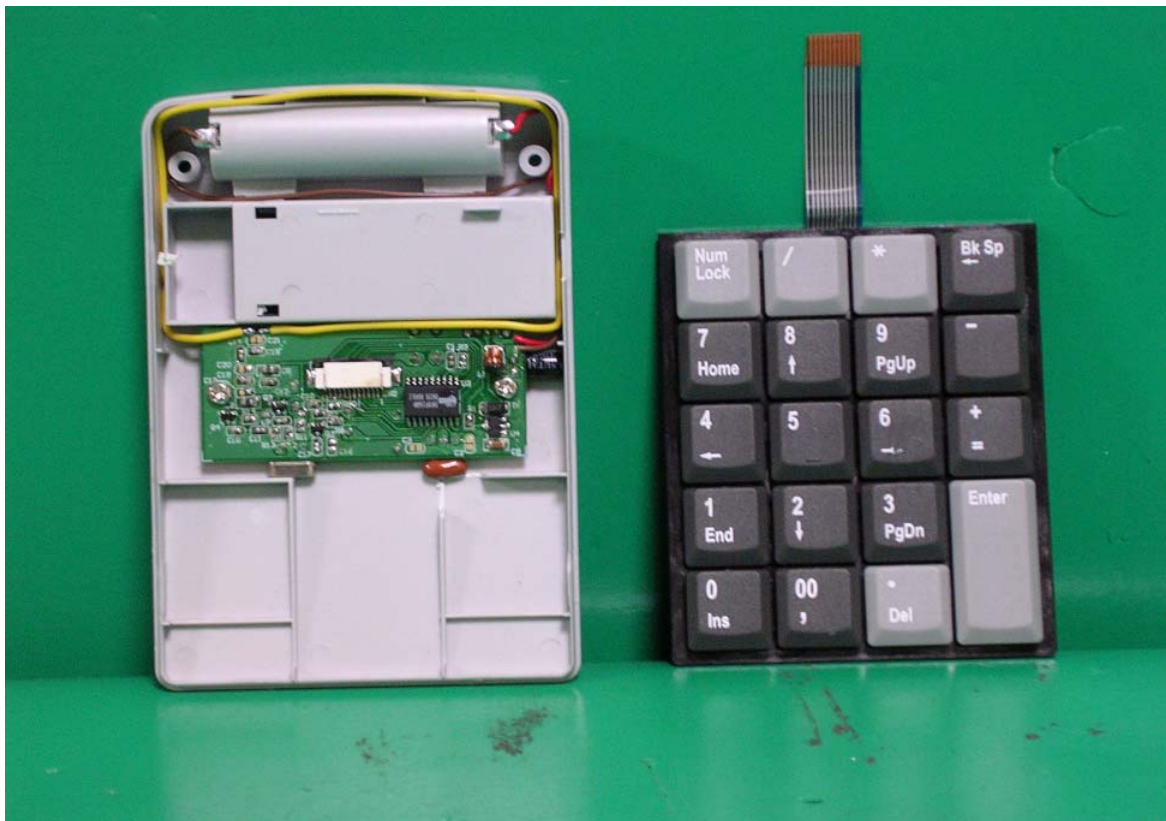


6. Back View Of Wireless Mobile Mini Keypad (EUT)
7. Inner View Of Wireless Mobile Mini Keypad (EUT)



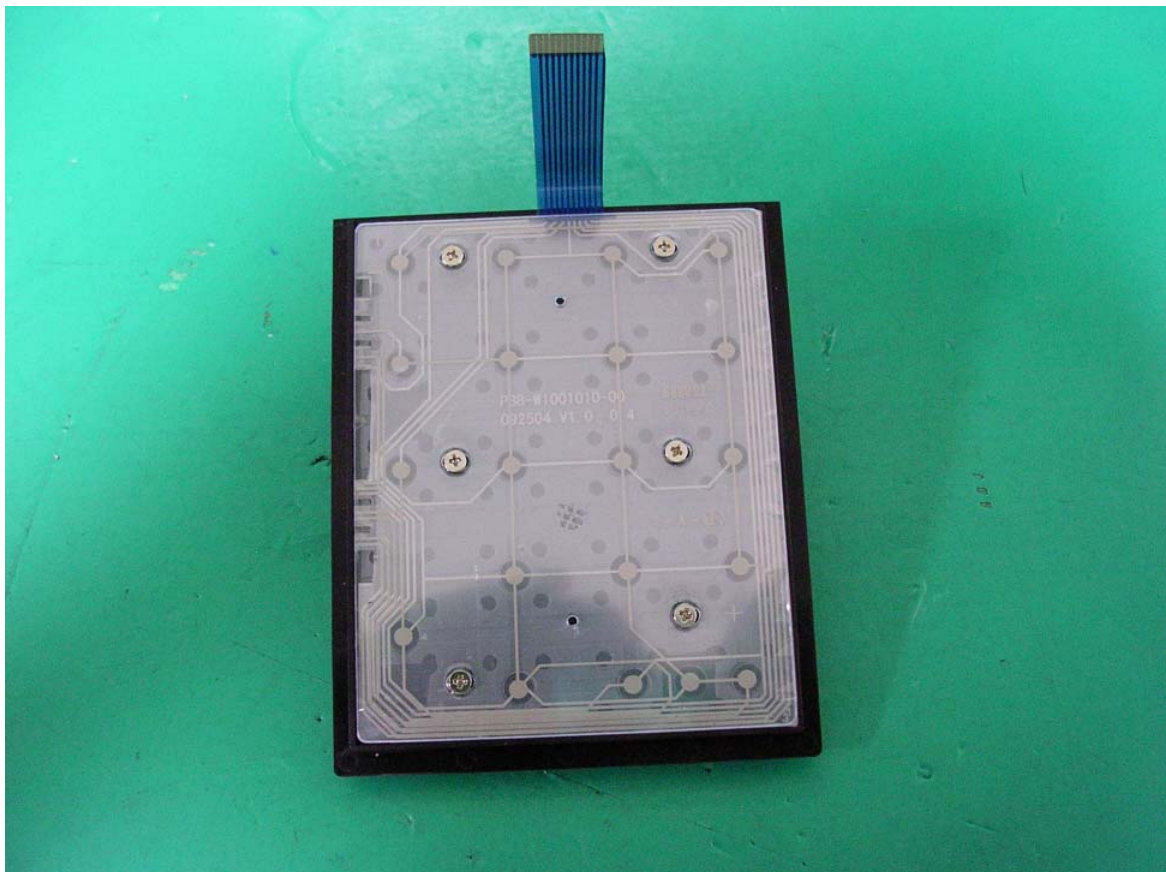
8. Inner View Of Wireless Mobile Mini Keypad (EUT)

9. Inner View Of Wireless Mobile Mini Keypad (EUT)



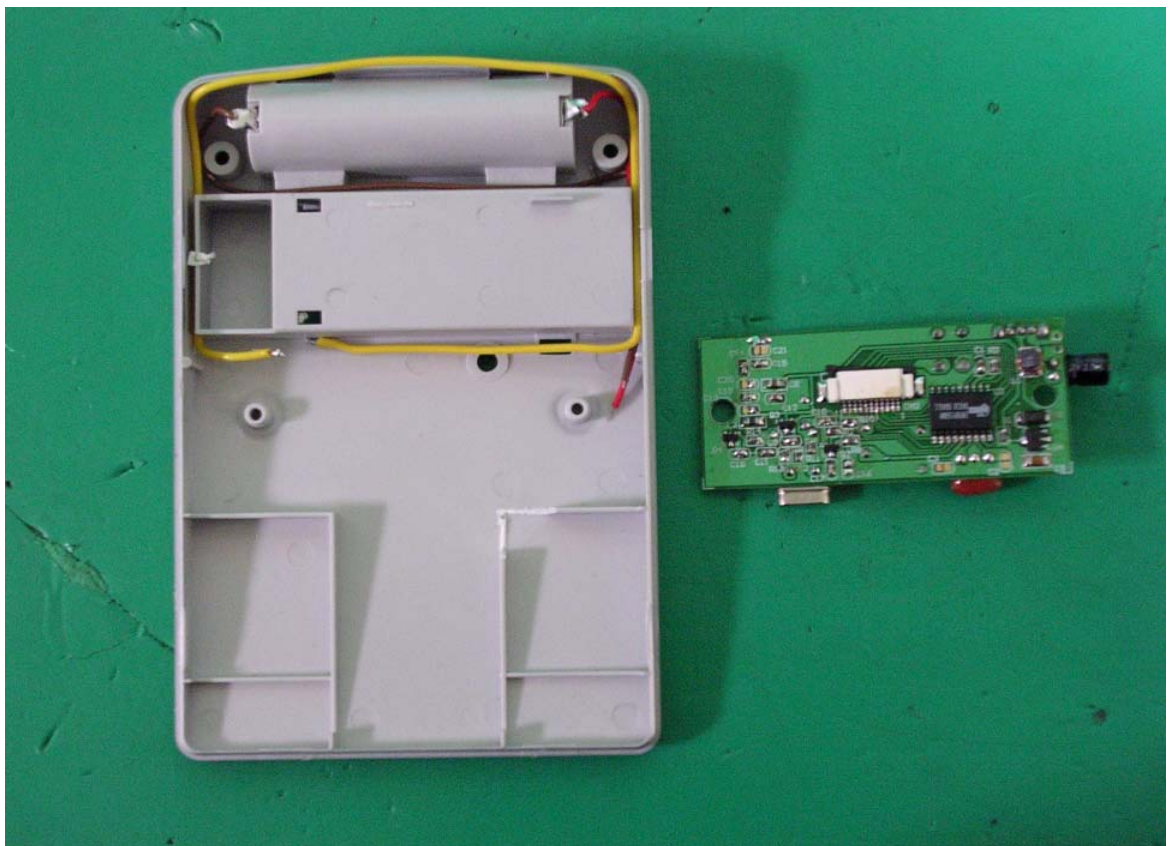
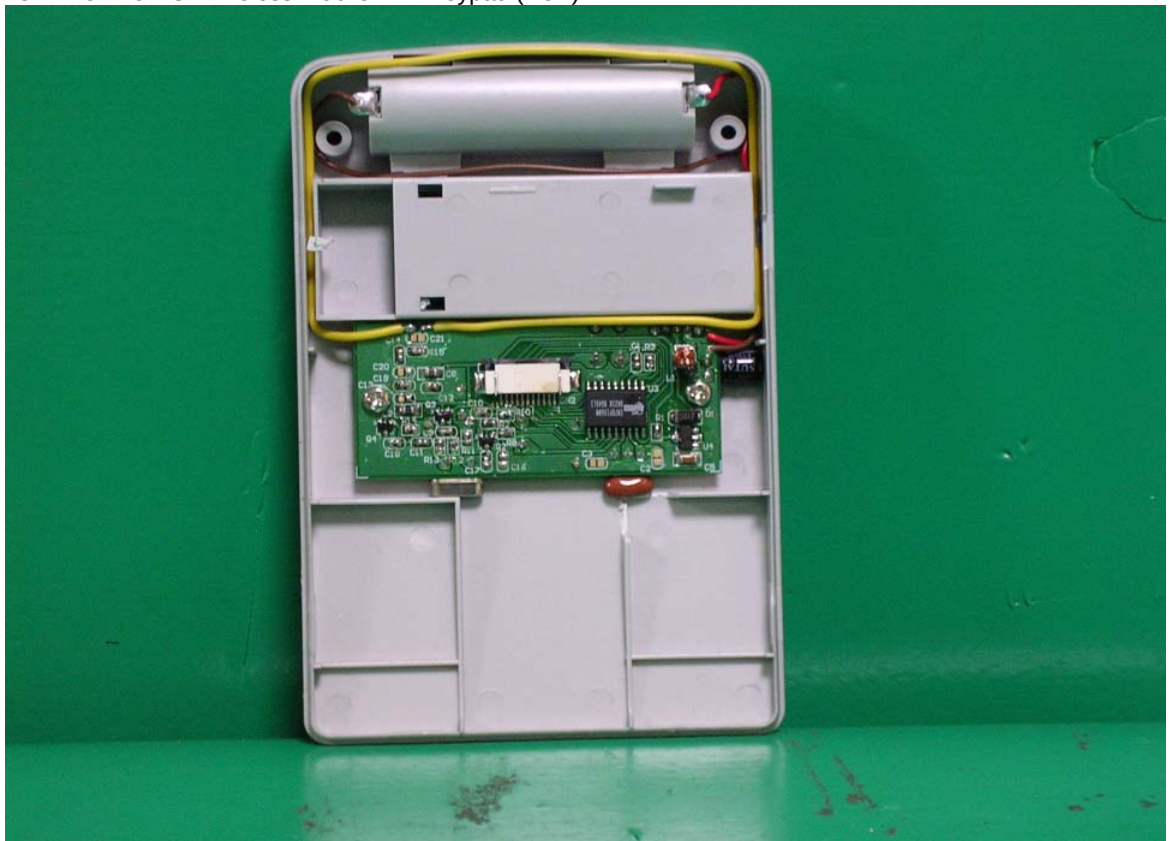
10. Inner View Of Wireless Mobile Mini Keypad (EUT)

11. Inner View Of Wireless Mobile Mini Keypad (EUT)

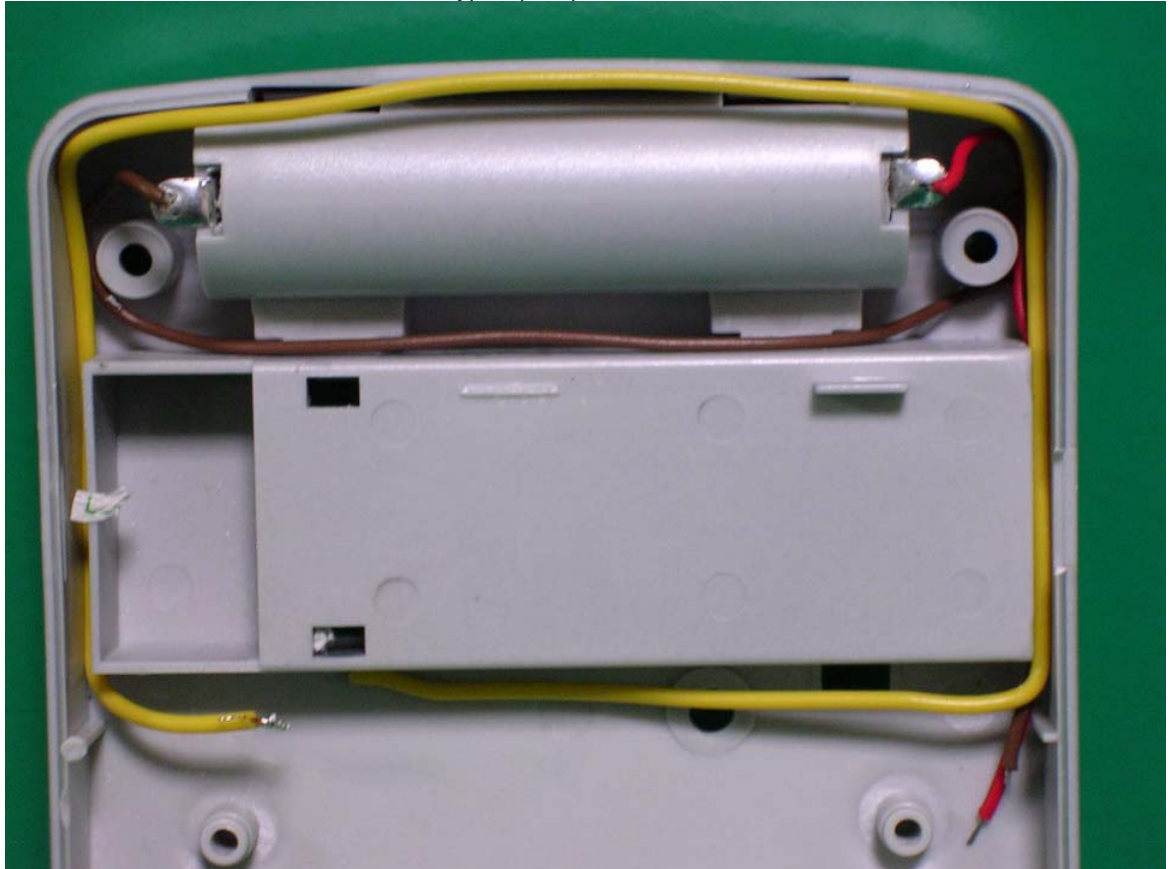


12. Inner View Of Wireless Mobile Mini Keypad (EUT)

13. Inner View Of Wireless Mobile Mini Keypad (EUT)

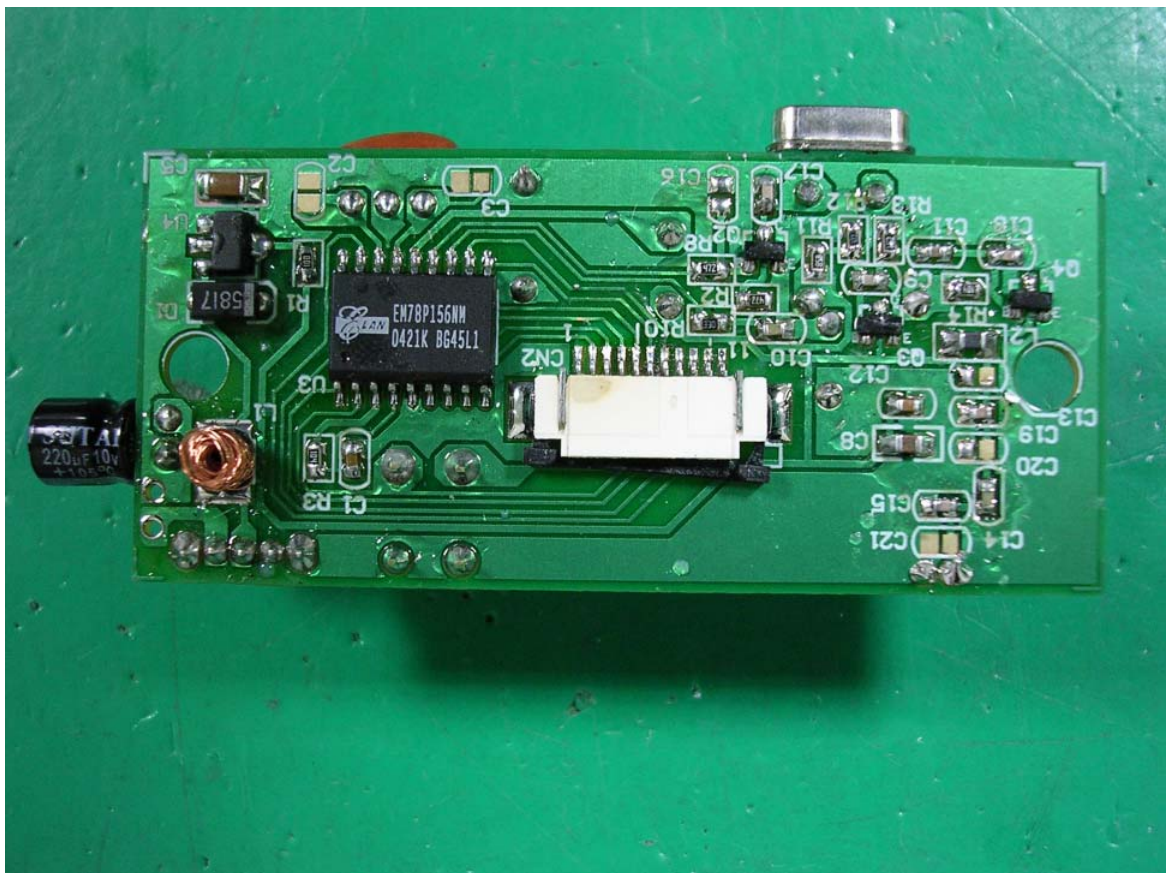
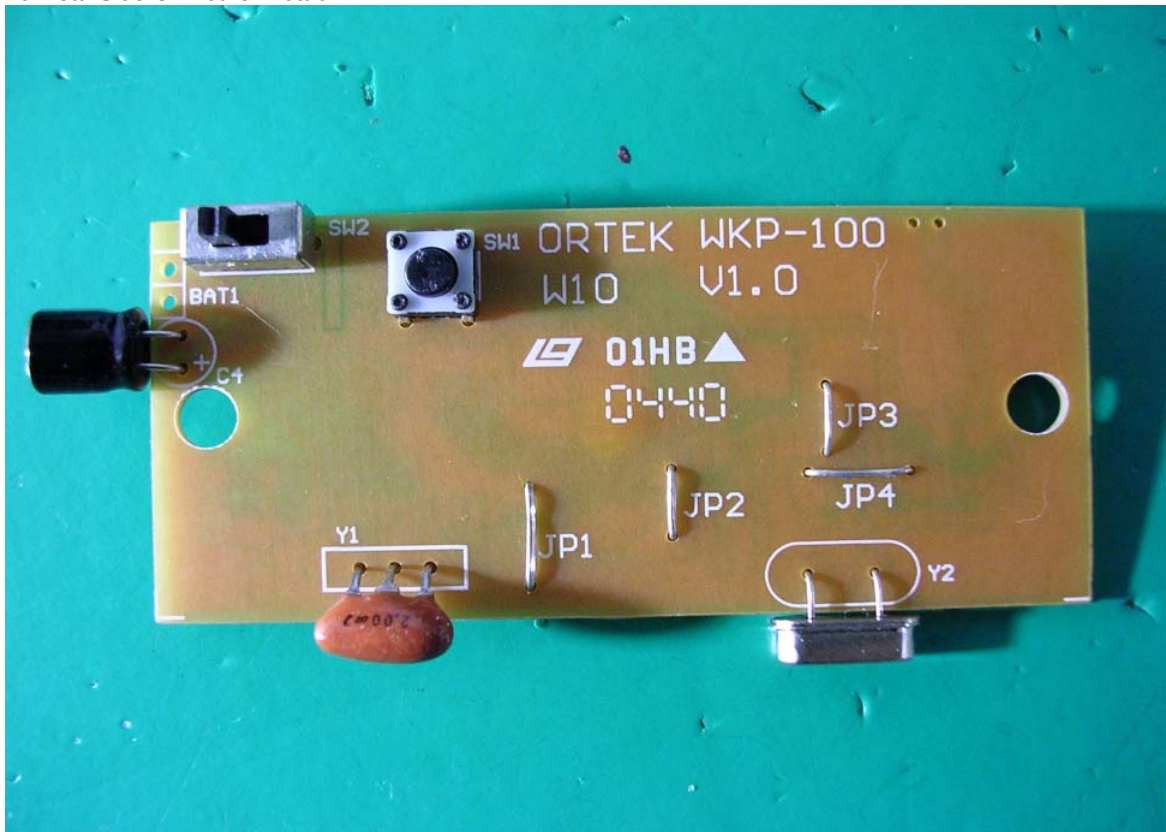


14. Inner View Of Wireless Mobile Mini Keypad (EUT)



15.Front Side Of Mother Board.

16.Rear Side Of Mother Board.



6. 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)