

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C REQUIREMENT**

OF

Talk and Listen Kit

FCC ID: SQQAL-250

MODEL No.: CGS-TM

BRAND NAME: N/A

REPORT NO: WE06070005

ISSUE DATE: July 31, 2006

Prepared for

**WASONIC UNITED LTD.
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Prepared by

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d.b.a.

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VERIFICATION OF COMPLIANCE

Applicant:	Wasonic United Ltd. Unit 1003A, 10/F, Tower A, New Mandarin Plaza , No.14, Science Museum Road, Kowloon, Hong Kong
Product Description:	Talk and Listen Kit
Brand Name:	N/A
Model Number:	CGS-TM
Serial Number:	N/A
File Number:	WE06070005
Date of Test:	July 26, 2006 ~July 28,2006

We hereby certify that:

The above equipment was tested by SHENZHEN HUA TONG WEI INTERNATIONAL INSPECTION CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.237.

The test results of this report relate only to the tested sample identified in this report.

Approved By


Jimmy Li / Executive Manager
SHENZHEN HUA TONG WEI
INTERNATIONAL INSPECTION CO., LTD.

Reviewed By


Tracy Qi / Testing Engineer
SHENZHEN HUA TONG WEI
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1. GENERAL INFORMATION

1.1 Product Description

The EUT is a short range, lower power, portable, high-performance wireless system composed of the CGS-TM Transmitter. It is designed by way of utilizing the FM modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency Ranges: 72.0-73.0 MHz, 74.6-74.8MHz, and 75.2-76.0MHz, eight channels.
- B). Modulation: FM
- C). Antenna Designation: Non-User Replaceable (Fixed)
- D). Power Supply: DC 3V by battery.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **SQQAL-250** filing to comply with Section 15.237 of the FCC Part 15, Subpart C Rules. The composite system (receiver) is compliance with Subpart B is authorized under a verification procedure

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The fully anechoic chamber test site and conducted measurement facility used to collect the radiated data is located on the address of SHENZHEN HUA TONG WEI INTERNATIONAL INSPECTION CO., LTD Huatongwei Building, Keji Rd. 12 S., High-tech Park, Nanshan District, Shenzhen, Guangdong, P.R.China The fully anechoic chamber Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and CISPR 22/EN 55022 requirements.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

1.7 Laboratory Accreditations and Listings

The test facility is recognized, certified, or accredited by the following organizations:

CNAL-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAL/AC01: 2003 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 1999 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 1999 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is from Aug 24, 2005 to Sept 30, 2007

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, November 17,2003.

IC-Registration No.: 5377

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377 on November 28th, 2005.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The 3m Semi-anechoic chamber (12.2m × 7.95m × 6.7m) and Shielded Room (8m × 4m × 3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1920 and C-2067 respectively. Date of Registration: July 28, 2004. Valid time is until November 16, 2006.

The Shielded Room (8m × 4m × 3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-175 respectively. Date of Registration: July 28, 2004. Valid time is until July 27, 2007.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the TX frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions (Not applicable in this report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 Limitation

(1) Conducted Emission (Not applicable in this report)

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

(2) Radiated Emission

- a. The field strength of any emission within this band (section 15.227 frequency between 26.96MHz –27.28MHz) shall not exceed 10000 micro volts/meter at 3 meters. (80dB μ V at 3m) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.
- b. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209(Intentional Radiators general limit).as below.

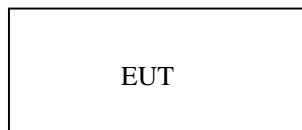
Frequency (MHz)	Field strength μ V/m	Distance(m)	Field strength at 3m dB μ V/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark: 1. Emission level in dB μ V/m=20 log (μ V/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ 15.205, then the general radiated emission limits in ξ 15.209 apply.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System



3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§ 15.203	Antenna Requirements	Compliant
§ 15.207	Conducted Emission	N/A
§ 15.237(b)	Occupied Bandwidth	Compliant
§ 15.237(c)	Radiated Emission	Compliant

4. DESCRIPTION OF TEST MODES

1. The EUT (Talk and Listen Kit) has been tested under normal operating condition.
2. The EUT stay in continuous transmitting mode. Three axes (X,Y,Z) are chosen for testing.

5. ANTENNA REQUIREMENTS

The antenna must be designed to ensure that no antenna other than the antenna supplied by the responsible party can be used with the device.

The EUT uses an antenna that is integral to the microphone cable provided with the transmitter. And, comply with part 15.203 rules.

6. CONDUCTED EMISSIONS TEST (Not applicable in this report)**6.1 Measurement Procedure:**

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)

N/A

6.3 Measurement Equipment Used:

Conducted Emission Test Site # 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS30	100038	2005/11	2006/11
ARTIFICIAL MAINS	ROHDE & SCHWARZ	ESH2-Z5	100028	2005/11	2006/11
PULSE LIMITER	ROHDE & SCHWARZ	ESHSZ2	100044	2005/11	2006/11
EMI TEST SOFTWARE	ROHDE & SCHWARZ	ES-K1 V1.71	N/A	2005/11	2006/11

6.4 Measurement Result:

N/A

6.5 Conducted Measurement Photos:

N/A

7. RADIATED EMISSION TEST

7.1 Measurement Procedure

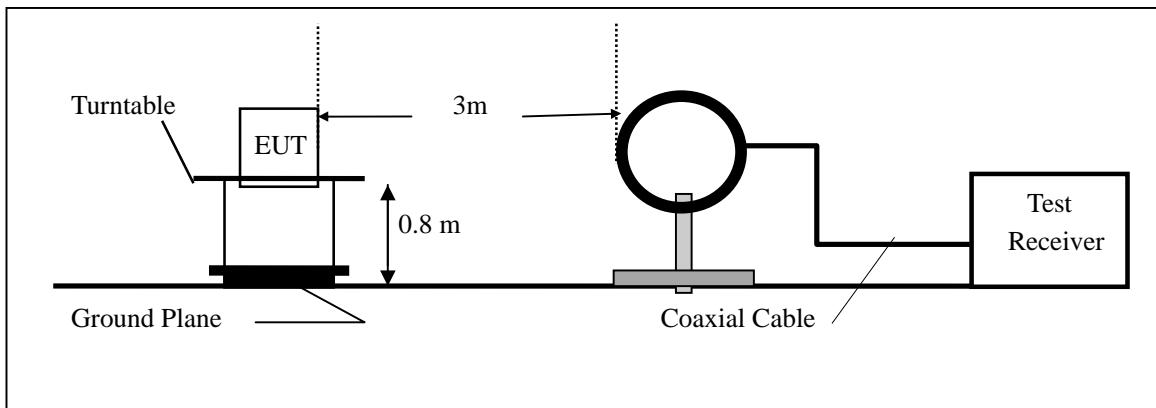
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on at least ten highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

Note:

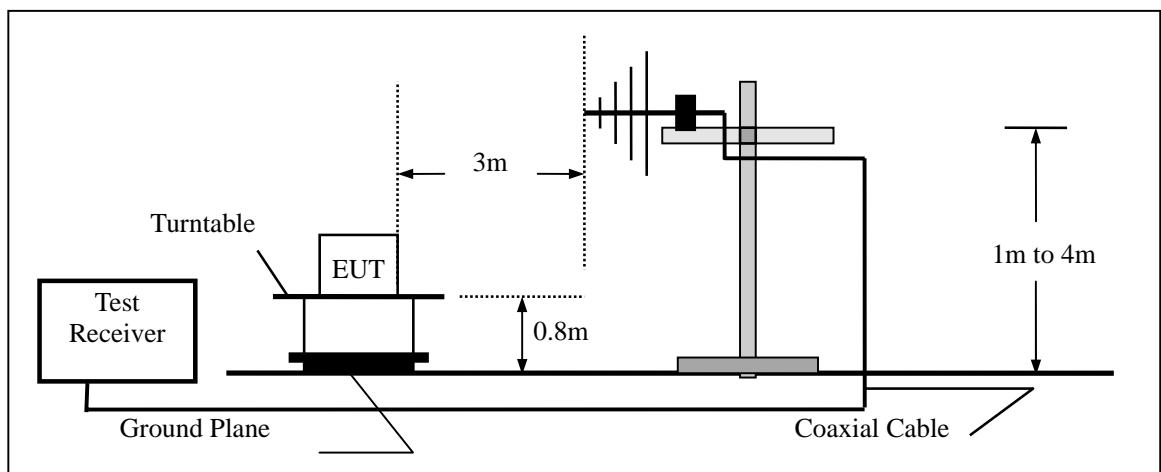
Three axes are chosen for pretest, the Z axis is the worst mode for final test.

7.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



7.3 Measurement Equipment Used:

3/5 Anechoic Chamber Radiation Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2005/11	2006/11
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2005/11	2006/11
RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	N/A	N/A
TURNTABLE	ETS	2088	2149	N/A	N/A
ANTENNA MAST	ETS	2075	2346	N/A	N/A
EMI TEST SOFTWARE	ROHDE & SCHWARZ	ES-K1 V1.71	N/A	2005/11	2006/11

7.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

7.5 Measurement Results

Operation Mode: Transmitting Mode On Channel 1
 Fundamental Frequency: 72.1 MHz
 Temperature : 23 °C

Test Date : July 27,2006
 Test By: Tracy Qi
 Humidity : 53 %

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
72.10	V	Peak	66.10	10.80	76.90	98.10	-21.20	F
72.10	H	Peak	77.90	10.80	88.70	98.10	-9.40	F
144.20	V	Peak	---	10.80		63.50		H
144.20	H	Peak	---	10.80		63.50		H
216.30	V	Peak	---	11.10		63.50		H
216.30	H	Peak	---	11.10		63.50		H
288.40	V	Peak	---	13.60		63.50		H
288.40	H	Peak	---	13.60		63.50		H
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 1 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz

Operation Mode: Transmitting Mode On Channel 5
 Fundamental Frequency: 74.7 MHz
 Temperature : 23 °C

Test Date : July 27,2006
 Test By: Tracy Qi
 Humidity : 53 %

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
74.70	V	Peak	64.90	10.80	75.70	98.10	-22.40	F
74.70	H	Peak	76.50	10.80	87.30	98.10	-10.80	F
149.40	V	Peak	---	10.80		63.50		H
149.40	H	Peak	---	10.80		63.50		H
224.10	V	Peak	---	11.10		63.50		H
224.10	H	Peak	---	11.10		63.50		H
298.80	V	Peak	---	13.60		63.50		H
298.80	H	Peak	---	13.60		63.50		H
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 1 GHz.
- (2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz

Operation Mode: Transmitting Mode On Channel 8
 Fundamental Frequency: 75.9 MHz
 Temperature : 23 °C

Test Date : July 27,2006
 Test By: Tracy Qi
 Humidity : 53 %

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
75.90	V	Peak	63.20	11.40	74.60	98.10	-23.50	F
75.90	H	Peak	77.60	11.40	89.00	98.10	-9.10	F
151.80	V	Peak	---	10.90		63.50		H
151.80	H	Peak	---	10.90		63.50		H
227.70	V	Peak	---	11.90		63.50		H
227.70	H	Peak	---	11.90		63.50		H
303.60	V	Peak	---	14.10		63.50		H
303.60	H	Peak	---	14.10		63.50		H
Others			---					

Remark:

- (1) Measuring frequencies from 30 MHz to the 1 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

8. OCCUPIED BANDWIDTH

8.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Based on FCC Part15 C Section 15.237(b):,RBW= 10KHz.,VBW= 30KHz,Span=200KHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

8.2 Test SET-UP (Block Diagram of Configuration)

Same as 7.2 Radiated Emission Measurement.

8.3 Measurement Equipment Used:

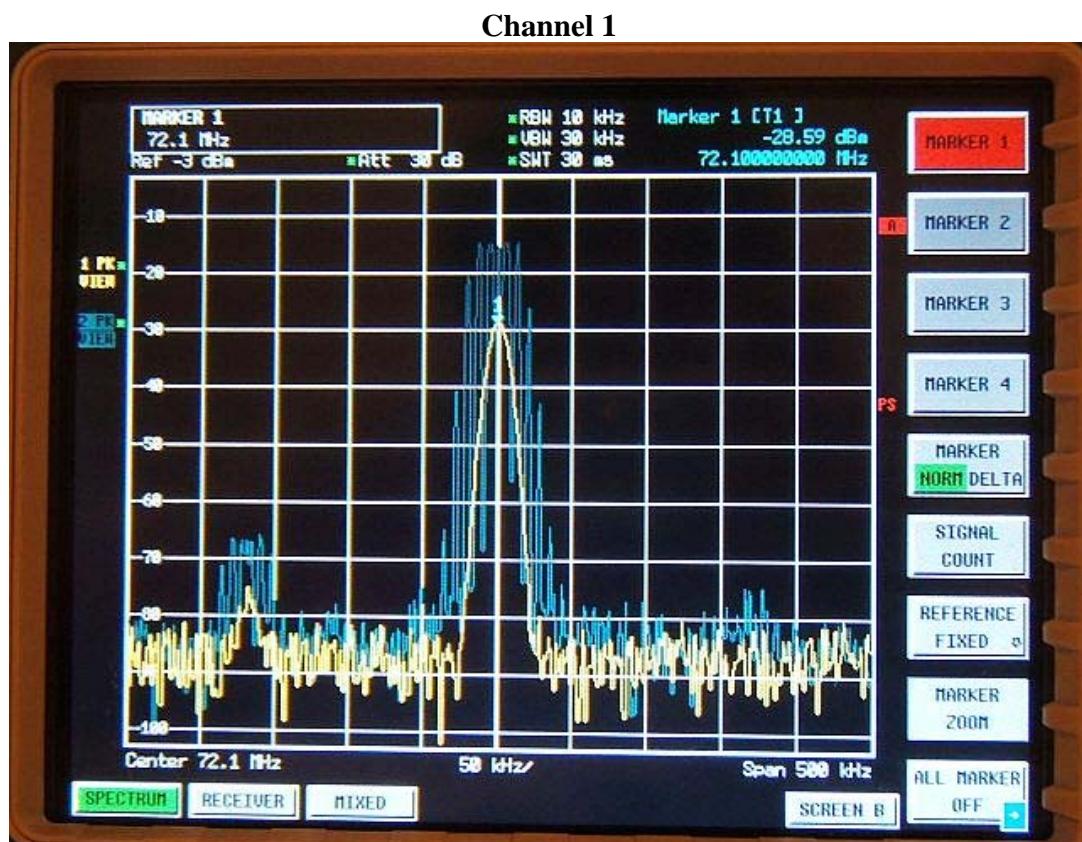
Same as 7.3 Radiated Emission Measurement.

8.4 Measurement Results:

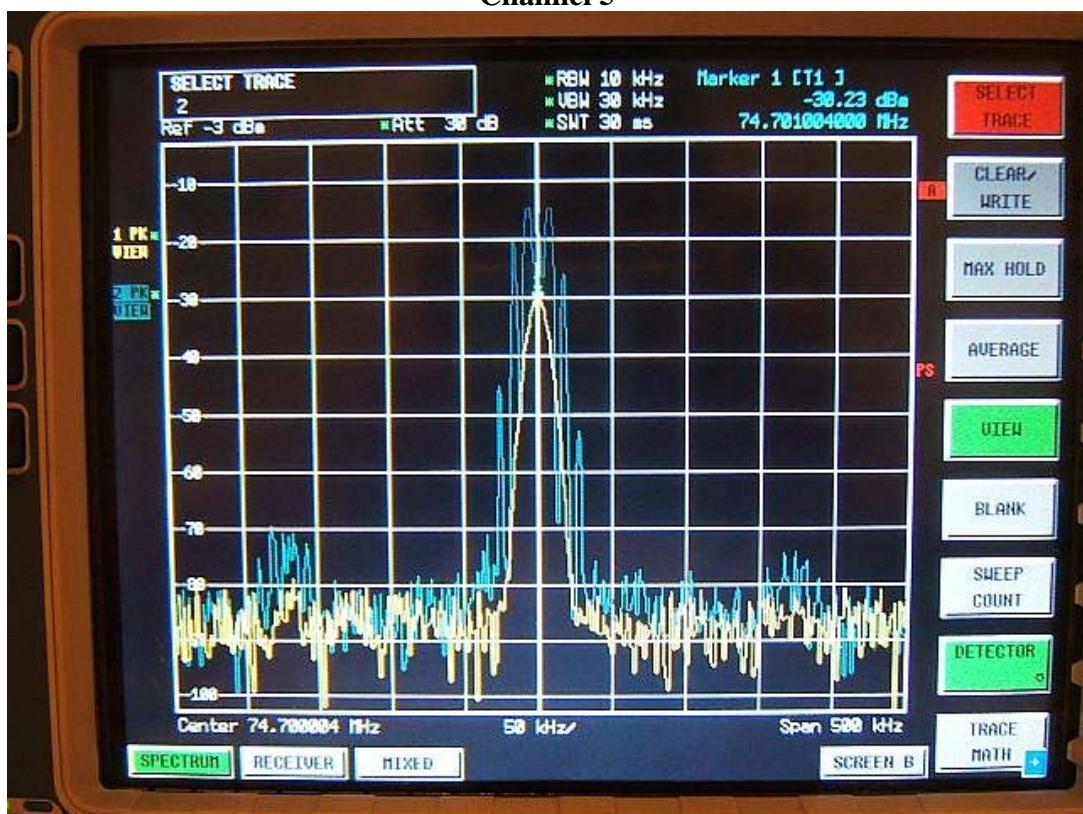
The graph as below, represents the emissions take for this device.

Note: The yellow curve represents unmodulated signal.

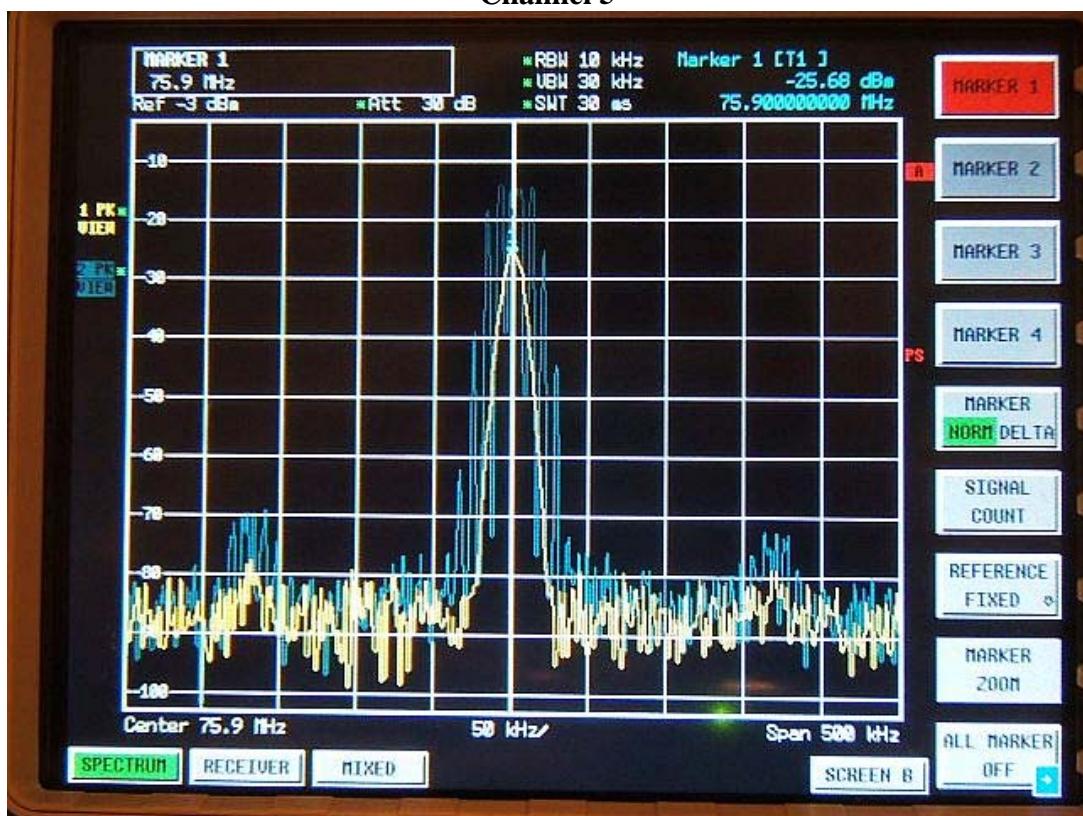
The blue curve represents modulated signal.



Channel 5



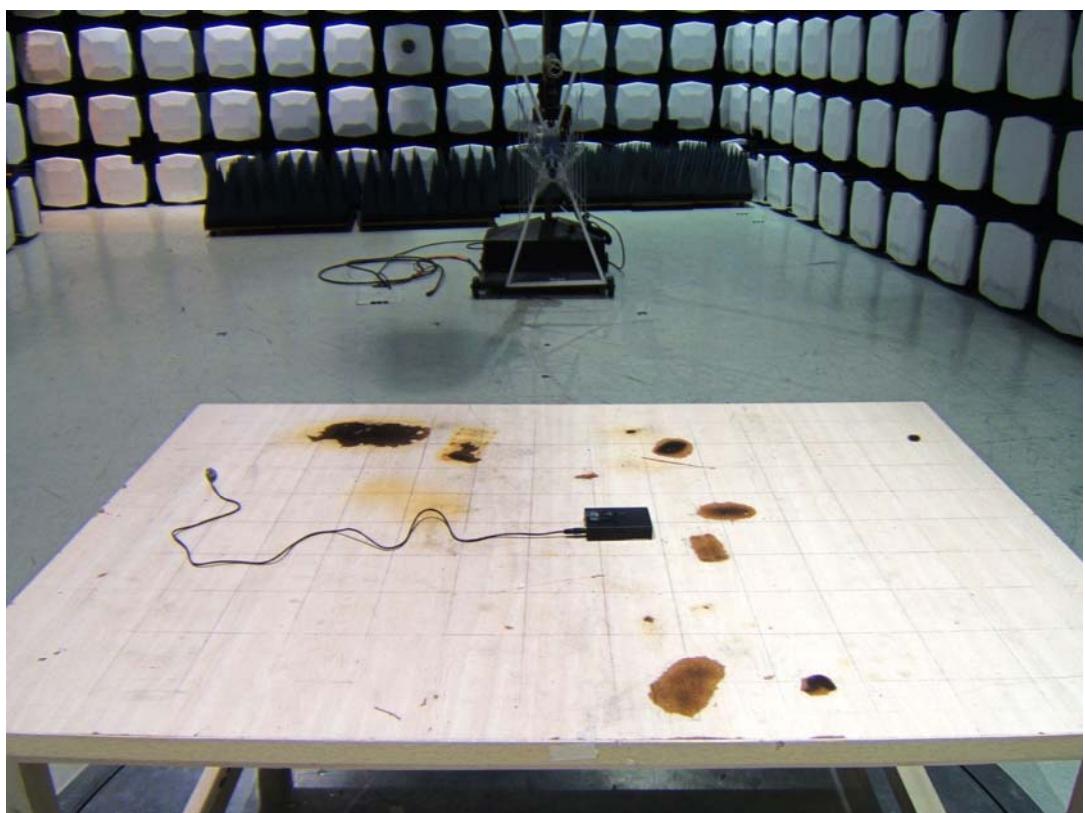
Channel 5



APPENDIX 1

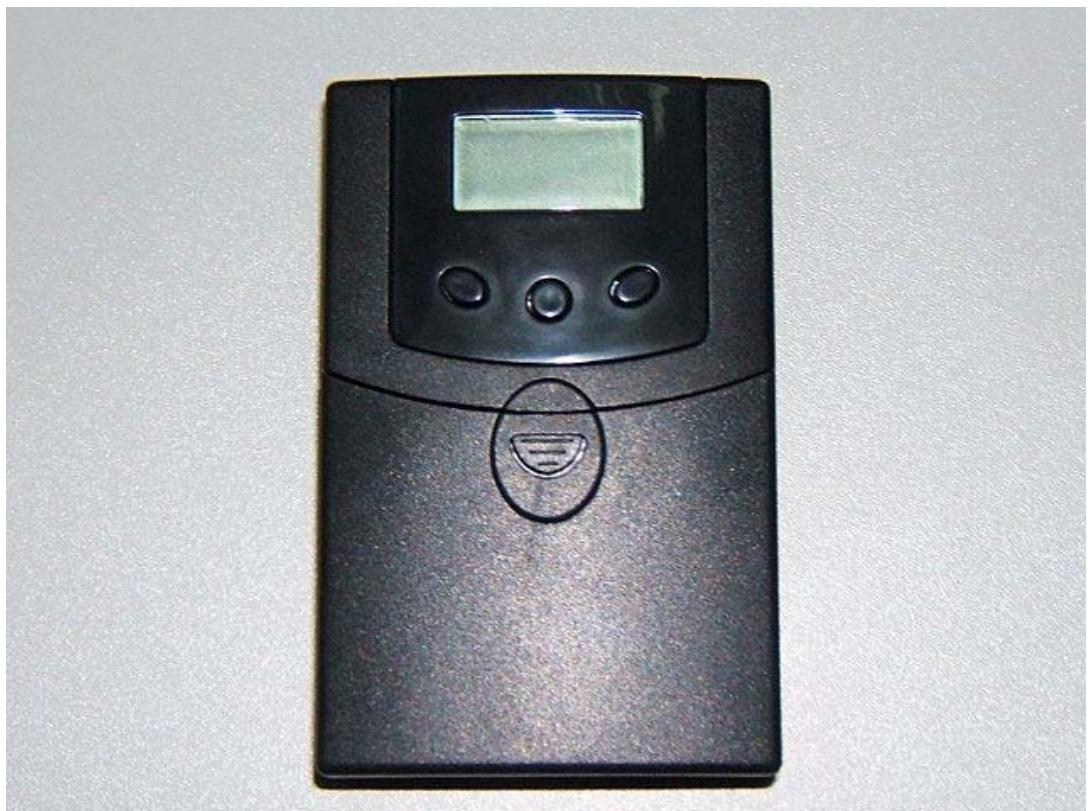
PHOTOGRAPHS OF SET UP

Radiated Emission Setup Photos



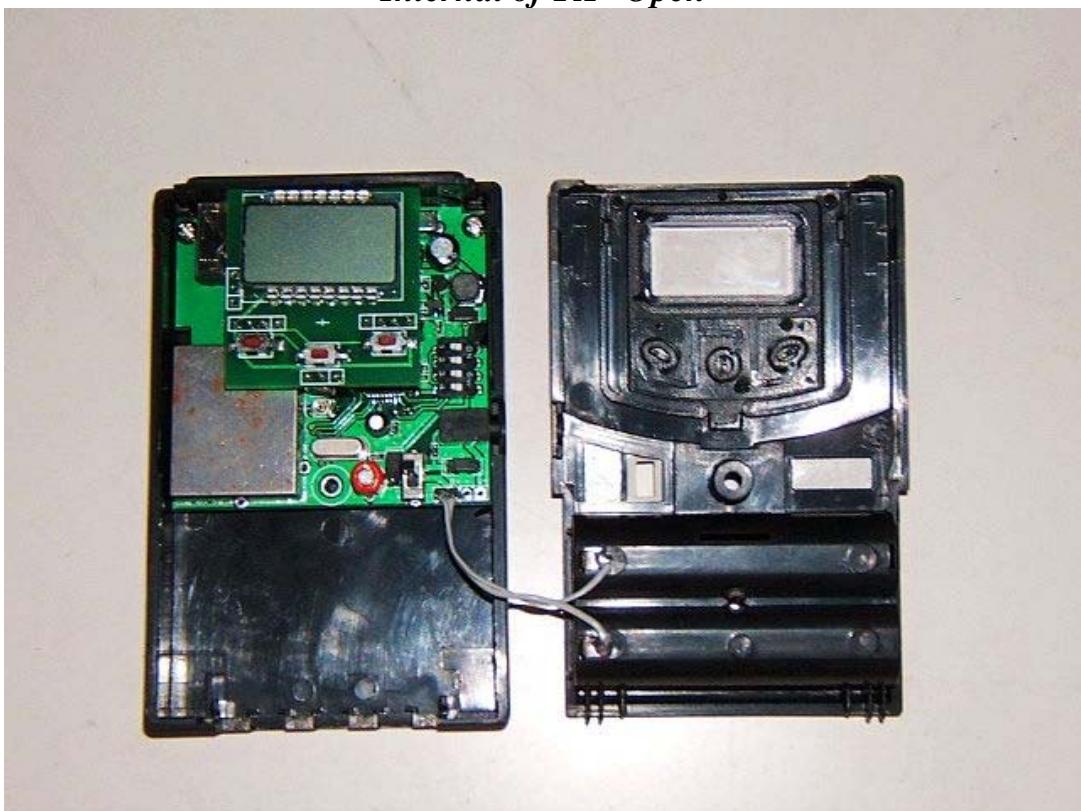
APPENDIX 2

PHOTOGRAPHS OF EUT

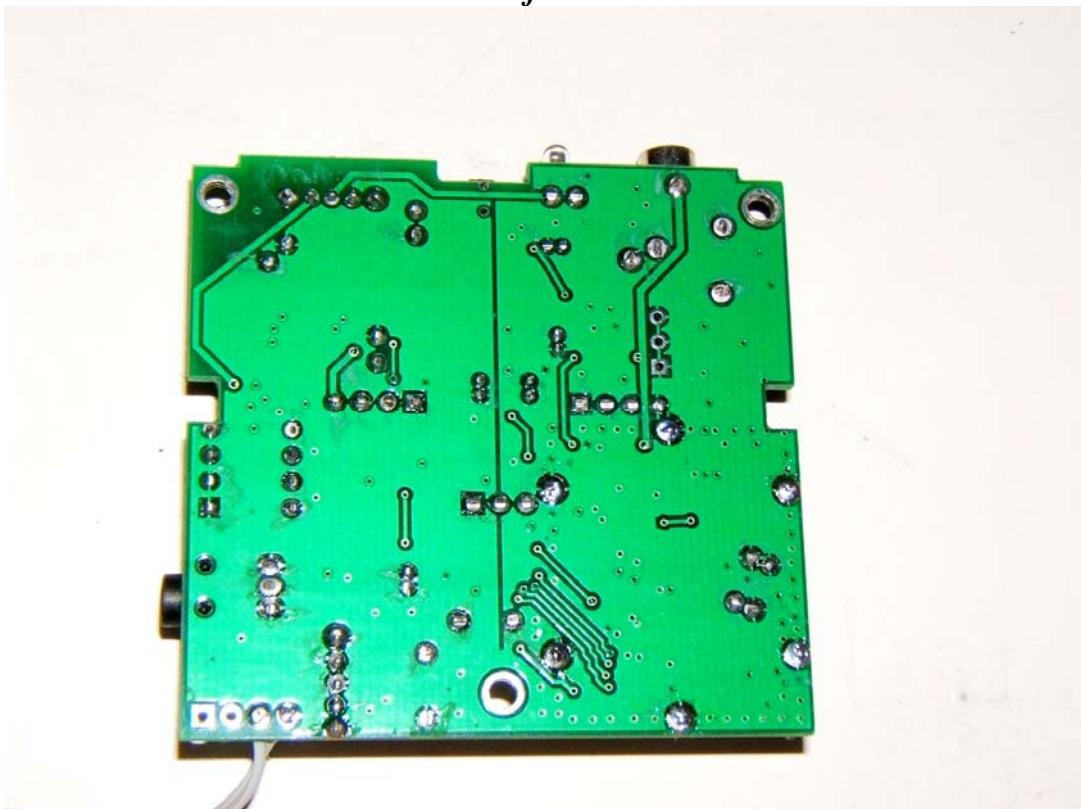




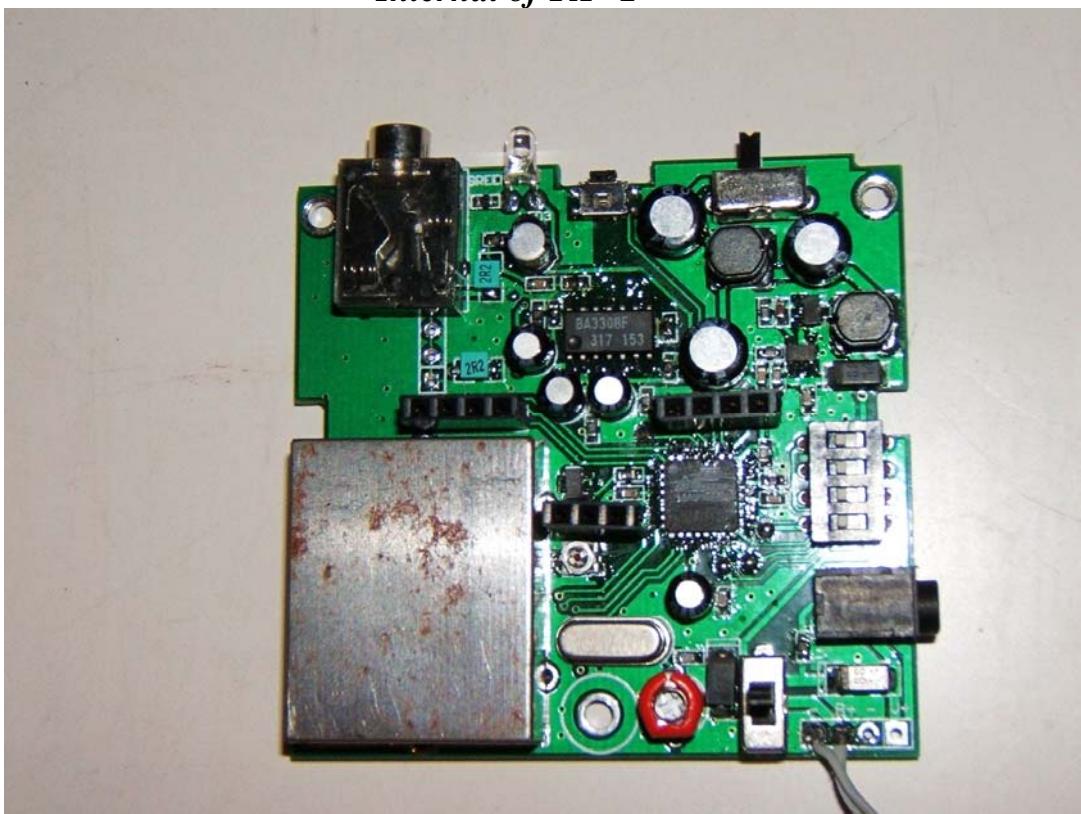
Internal of TX- Open



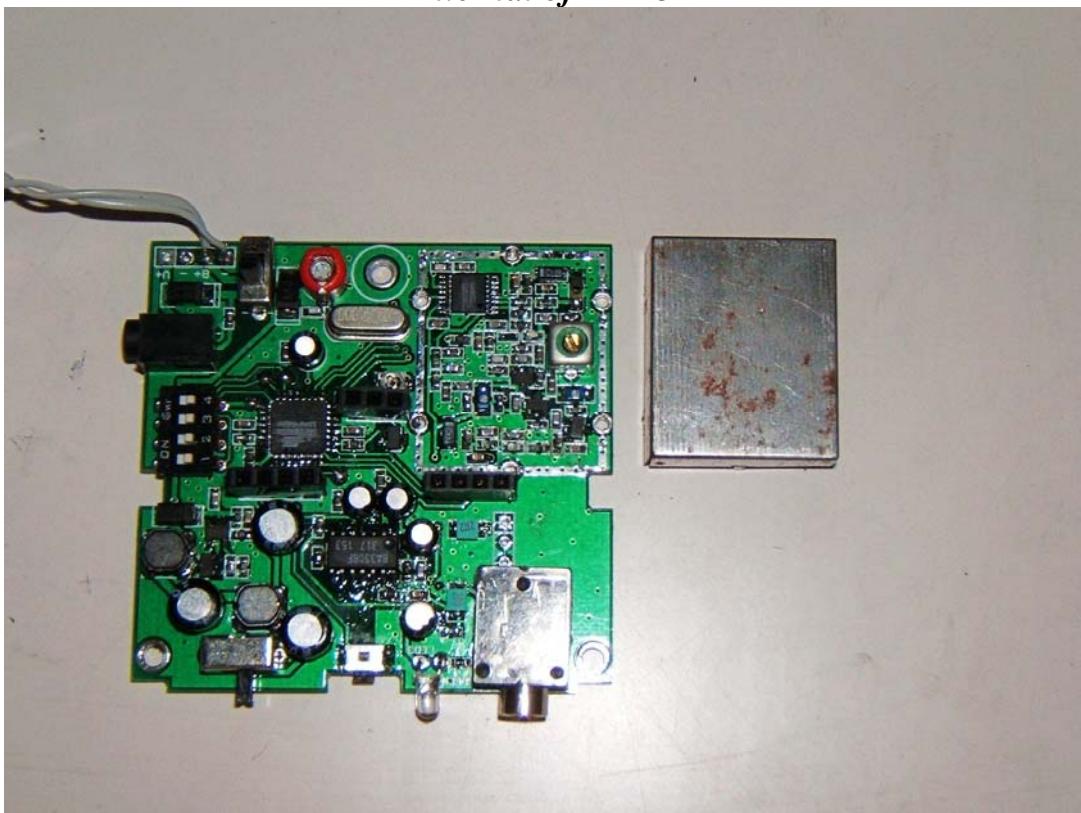
Internal of TX- 1



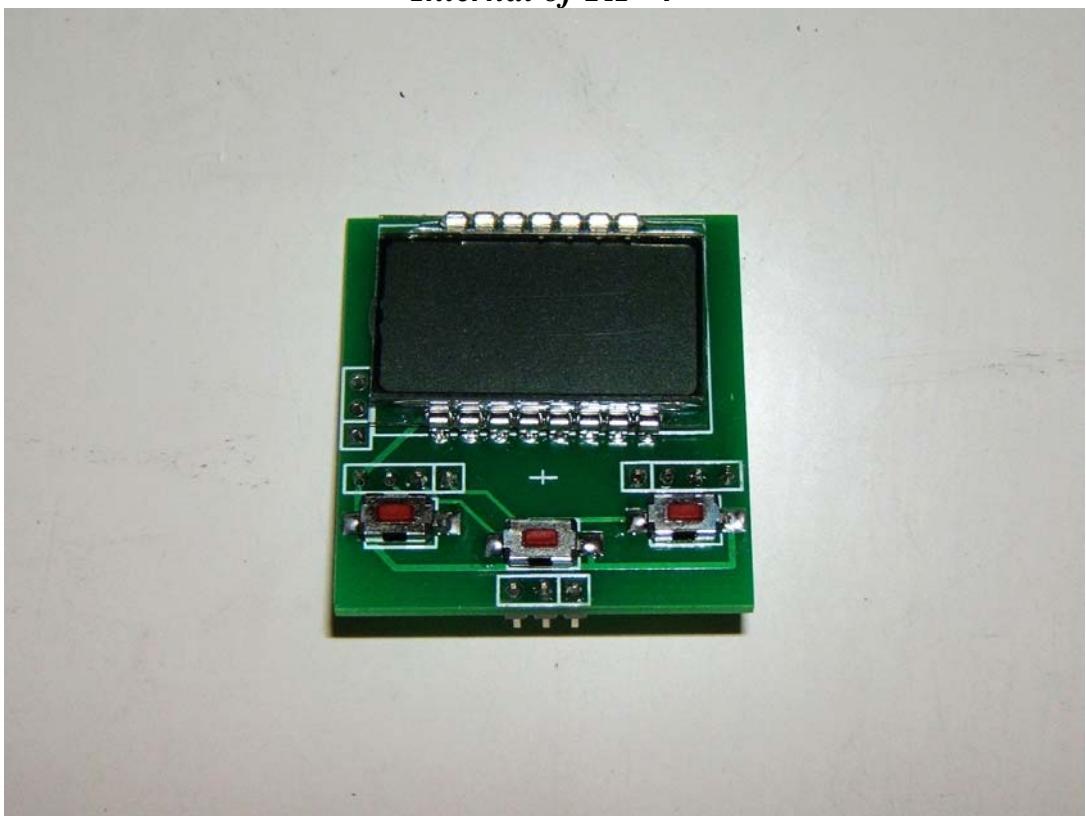
Internal of TX- 2



Internal of TX- 3



Internal of TX- 4



Internal of TX- 5

