

EMI TEST REPORT

According to

FCC Part 15 Class B Subpart C

EUT Type **RF MODULE TRANSMITTER & RECEIVER**

Transmitter (TX) **1) Model No.: SG1010**
2) FCC ID: RFV101011AB
3) Power Supply: DC 3V, battery Type AAA, 1.5Vdc x 2

Receiver (RX) **1) Model No.: SG1011**
2) FCC ID: N/A, (under DoC)
3) Power Supply: DC Battery 3V x 2 (CR2032)

Applicant Name: **TGC ENTERPRISES**

Address See the General Information for details.

Test Date : 2003-08-20 Issued Date : SEP. 17, 2003

Test Engineer : JASON KUNG NVLAP Signature : Peter Kao
Peter Kao / Director

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- The report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States government.
- The testing result in this report are traceable to national or international standard .

PEP TESTING LABORATORY

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih.

Taipei Hsien, Taiwan, R. O. C.

Tel : 8862-26922097 Fax : 8862-26956236

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1. General Information

1.1 Verification of Compliance

EUT: RF MODULE TRANSMITTER & RECEIVER
 FCC ID: RFV101011AB
 Applicant: TGC ENTERPRISES
 Address: 38248 HILLSHIRE AVE. NORTH BRANCH MN.55056

Test Type: CERTIFICATION
 Result: PASS
 Tested Lab.: PEP Testing Laboratory
 Test Date: AUG. 20, 2003
 Report Number: E920416

The above equipment was tested by PEP Testing Laboratory for compliance with the requirement set forth in the FCC rules and regulations Part 15, subpart C. This said equipment in the configuration described in the report, shows, the maximum emission levels emanating from equipment are within the compliance requirements.

Measurement Uncertainty :

The uncertainty of the radiated emission is given as below. The method of uncertainty Calculation is provided in PEP Testing Lab. Document No. QP-T-27-A.

Expanded Uncertainty	2.8 (dB)
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※ (95% Confidence Level); K=2

1.2 Equipment Modifications

The applicant upon signing the Declaration of Conformity agrees to incorporate the following modification(s) into all production units, please refer to the attached pages in this report.

- (A) Apply copper foil to circuit board of model SG1010 shown as page 21.
- (B) Mount one suppression core to the antenna cable of model SG1010 shown as page 21.

1.3 Product Information

System Configuration

ITEM	DESCRIPTION		FCC ID
	TX	RX	RFV101011AB
Product	RF MODULE TRANSMITTER & RECEIVER		
Housing	ABS	ABS	
Channel	1	1	
Battery	DC 3V, $\leq 4\text{mA}$	DC 6V, $\leq 10\text{mA}$	
Fundamental.	433.92 MHz	433.92 MHz	
Modulation	Pulse Modulation	AM	
Crystal Osc. Frcq.	433.92 MHz	32.768 KHz	
Device Type	Continuous Operation		

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-1992 at an antenna to EUT distance of 3 meters.

1.5 Supporting Test Devices

N/A

1.6 Test Equipment

Description	Manufacture/ Model	Serial No.	Next Cal. Date
Spectrum Analyzer	R & S FSP 7GHz	100607	2004-05-13
Antenna	SCHWARZBECK VULB9160	3074	2004-08-23
Pre-amplifier	Schaffner CPA 9232	1012	2004-08-22
Signal Generator	R & S SMY 02	829846/038	2004-01-31
HORN Antenna	R & S AH-118	10056	2004-05-21
Pre-amplifier	Miteq JS400101800-28-5A	808329	2004-08-21

All Test Equipment Used are Calibrated Traceable to NIST Standards.

1.7 Statement for the Document Use

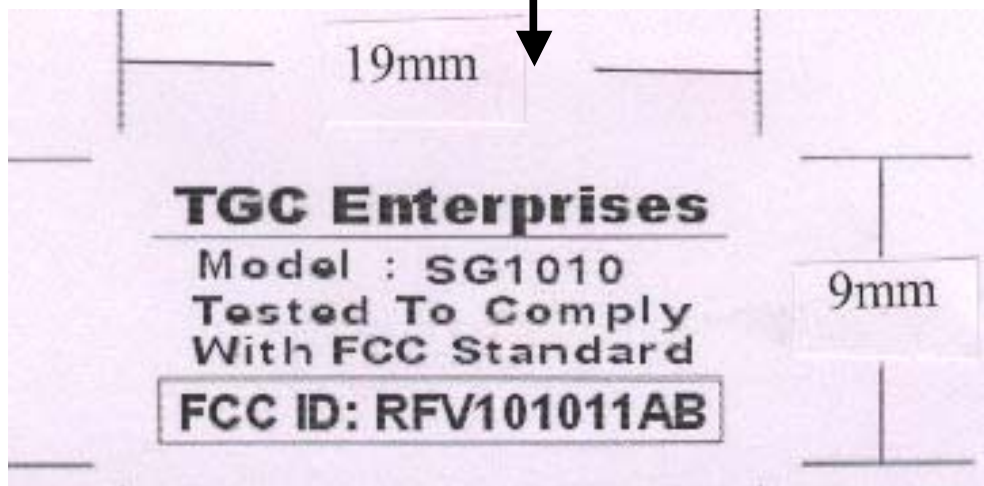
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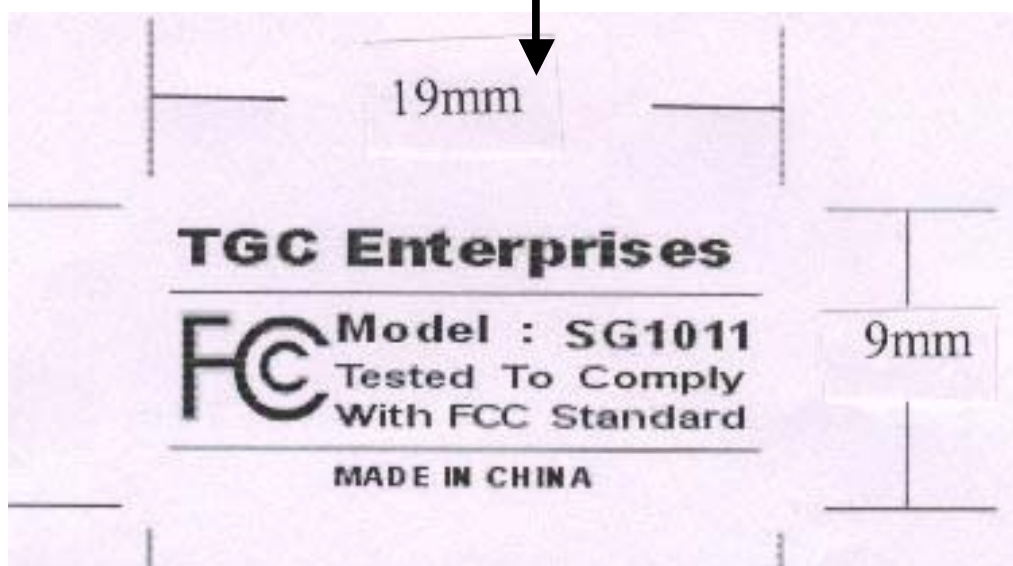
2. FCC ID Label Sample

The sample label shown below shall be permanently affixed at a conspicuous location on the device, instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practicable, only the trade name, model number, and the FCC logo must be displayed on the device per Section §15.19 (b)(2).

EUT Label A



EUT Label B



3. System Test Configuration

3.1 Operational Description

Please refer to user's manual

3.2 Special Accessories

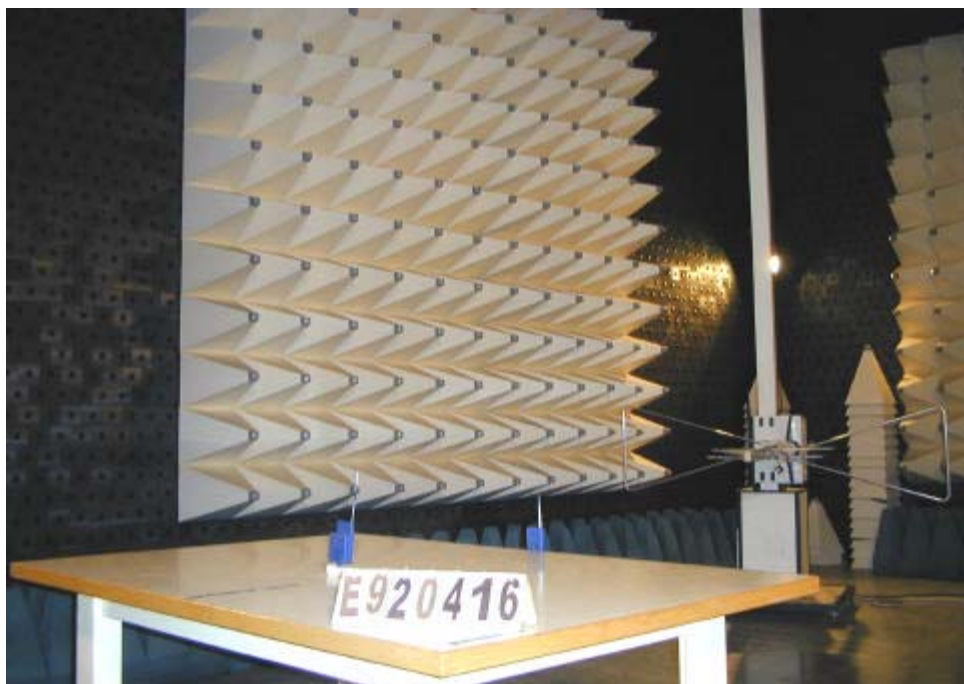
N/A

3.3 Configuration of Tested System

Figure 3.1 illustrate this system, which is tested standing along.

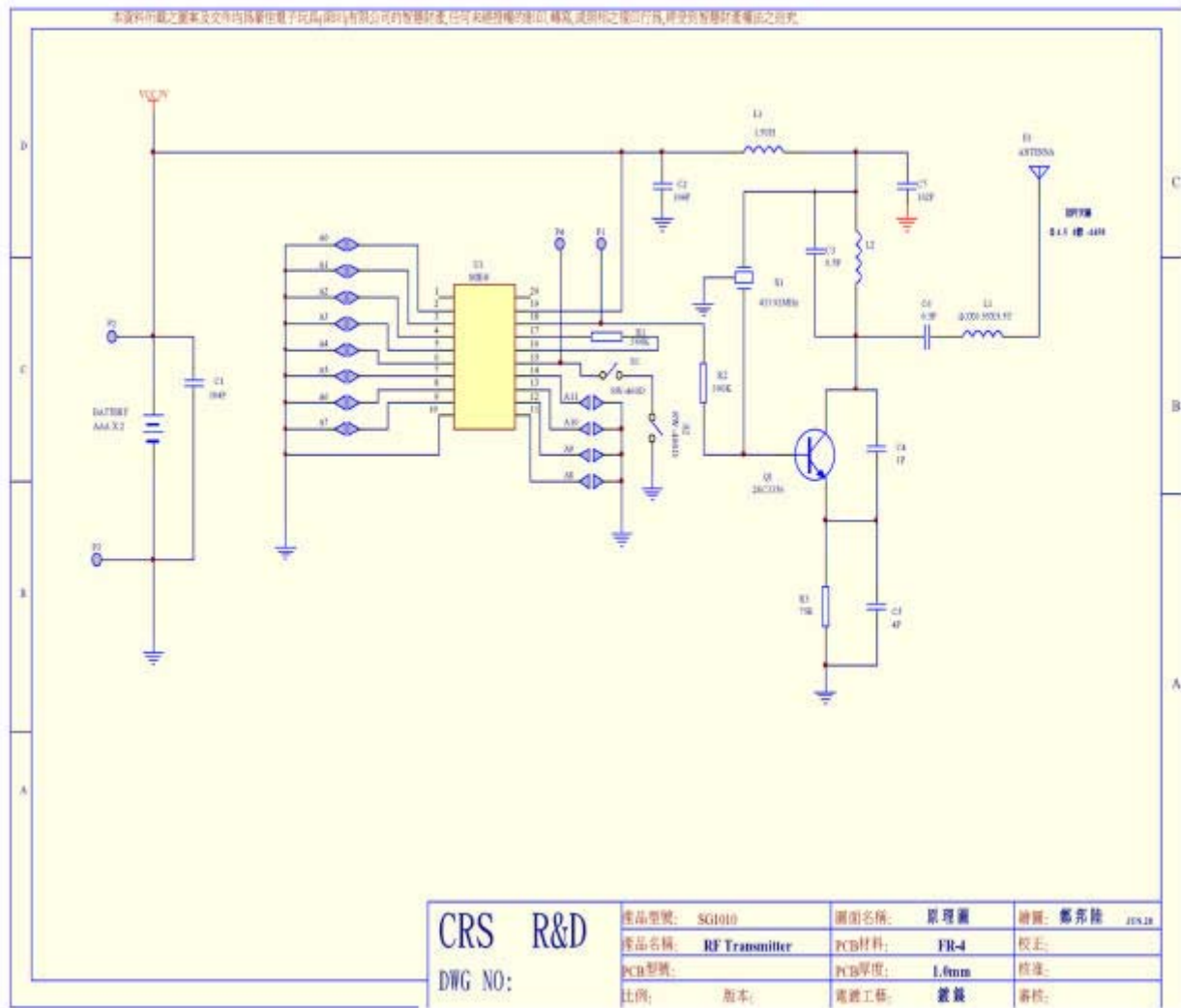
FCC ID: RFV101011AB

Figure 3.1



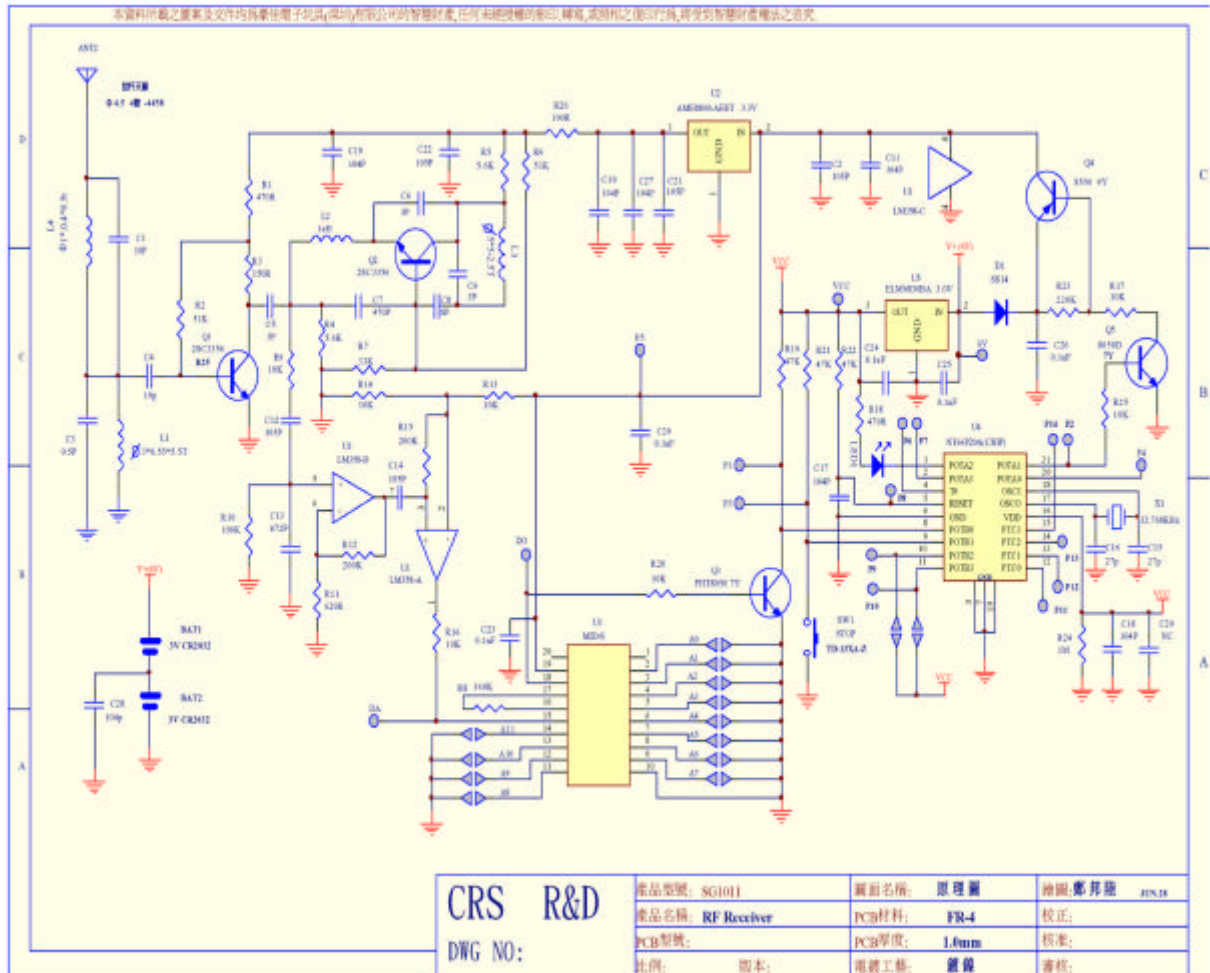
4. System Schematics

TX



FCC ID: RFV101011AB

RX



5. Radiated Emission Data

5.1 Test Methods and Conditions

The initial step in collecting radiated data is a spectrum analyzer scan of the measurement range 30MHz – 5GHz using peak detector. IF bandwidth is 120kHz and video bandwidth is 300kHz for measuring 30MHz-1GHz. Both bandwidth are 1MHz for above 1GHz measurement.

(A) The EUT is RF MODULE TRANSMITTER & RECEIVER, FCC ID: RFV101011AB, which contains a transmitter unit model SG1010 and a receiver unit SG1011. The working frequency is 433.92MHz. With pothook of model SG1010 as axis, coding signals will be transmitted when its antenna is upward over 75 degrees in any direction. The effective operating distance is more than 25 meter when both antennas of model SG1010 and SG1011 are totally pulled out. Two batteries (size AAA, DC1.5V) and two CR2032 batteries are respectively used to supply model SG1010 and SG1011 DC 3V and DC 6V. For more detail information about the EUT, please refer to the user's manual.

(B) Setup Method: On the basis of that SG1010 and SG1011 are both supplied by DC power source, we merely took EUT for radiated emission test. The EUT placement and operating condition were set by the following steps for test.

- (1) Locate the transmitter unit model SG1010 of EUT in the middle of the turntable.
- (2) Locate the receiver unit model SG1011 of EUT at the front edge of turntable.

The test was carried out on the ongoing transmitting operation between model SG1010 and SG1011. After preliminary test on EUT with 75-degree upward antenna set and 90-degree upward antenna set, we took EUT with 90-degree upward antenna set as worst-case operation for final test. The worst-case test result was recorded and provided in this report.

5.2 Test Data

The following data lists the significant emission frequencies, polarity and position.

Radiated Test Data

Frequency (MHz)	Polarity [H or V] Position (X,Y,Z)	Level (dB μ V/m)	Limit (dB μ V/m)	Result
433.92	H / 90°	65.24	80.20	Pass
867.7	H / 90°	49.39	60.20	Pass
*1301.5	H / 90°	49.10	54.00	Pass
1735.5	H / 90°	44.43	60.20	Pass
2169.6	H / 90°	30.24	60.20	Pass
2603.5	H / 90°	27.55	60.20	Pass
433.92	V / 90°	75.45	80.20	Pass
867.7	V / 90°	52.98	60.20	Pass
*1301.5	V / 90°	47.16	54.00	Pass
1735.5	V / 90°	40.12	60.20	Pass
2169.5	V / 90°	33.72	60.20	Pass

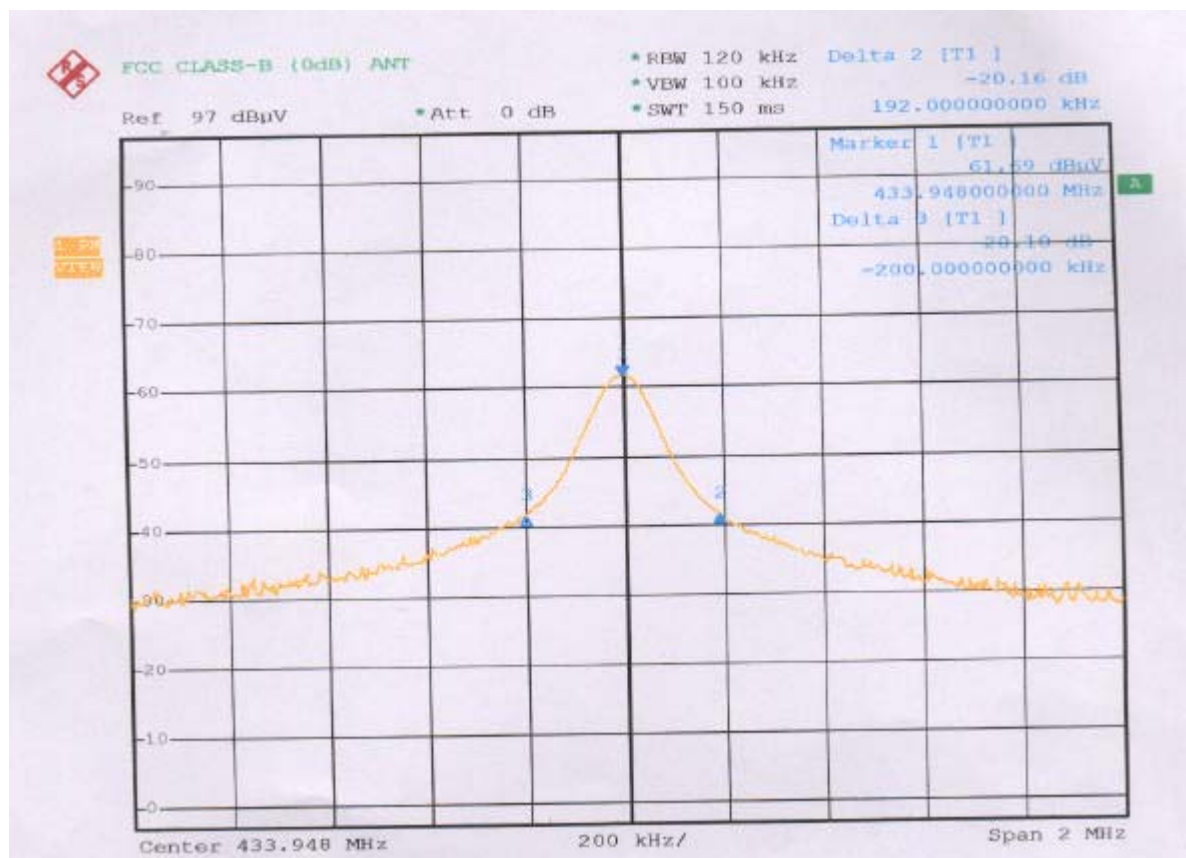
- (1) “ * “ Restricted band.
- (2) Below 1GHz : Peak Value (RBW:120KHz, VBW:300KHz)
- (3) Above 1GHz : Average Value (RBW:1MHz, VBW:1MHz)
- (4) Fundamental limit is 3750-12500uV/m linear interpolations.
- (5) Spurious limit is 375-1250 uV/m linear interpolations.

5.3 Occupied Bandwidth

The bandwidth of the emission shall be no wider than 0.25% of the center frequency, in this case, **1.0848 MHz**. Bandwidth is determined at the points 20dB down from the modulated carrier. Figure 5.1 shows the occupied bandwidth plot [It's about **0.188 MHz** and **0.2 MHz**] .

FCC ID: RFV101011AB

Figure 5.1 Occupied Bandwidth



6. EUT External Photos

PHOTO. 1. EUT (TX + RX) FRONT VIEW



PHOTO. 2. EUT (RX) FRONT VIEW



FCC ID: RFV101011AB

PHOTO. 3. EUT (RX) REAR VIEW

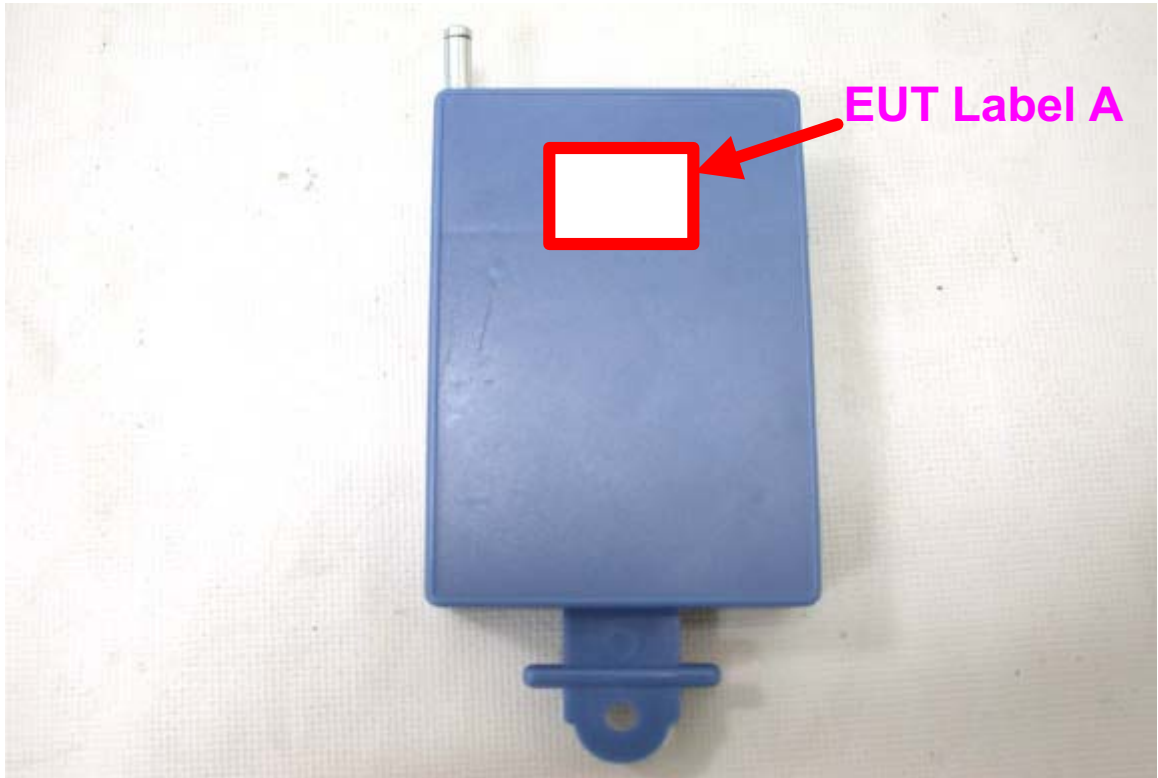


PHOTO. 4. EUT (TX) FRONT VIEW



FCC ID: RFV101011AB

PHOTO. 5. EUT (TX) REAR VIEW



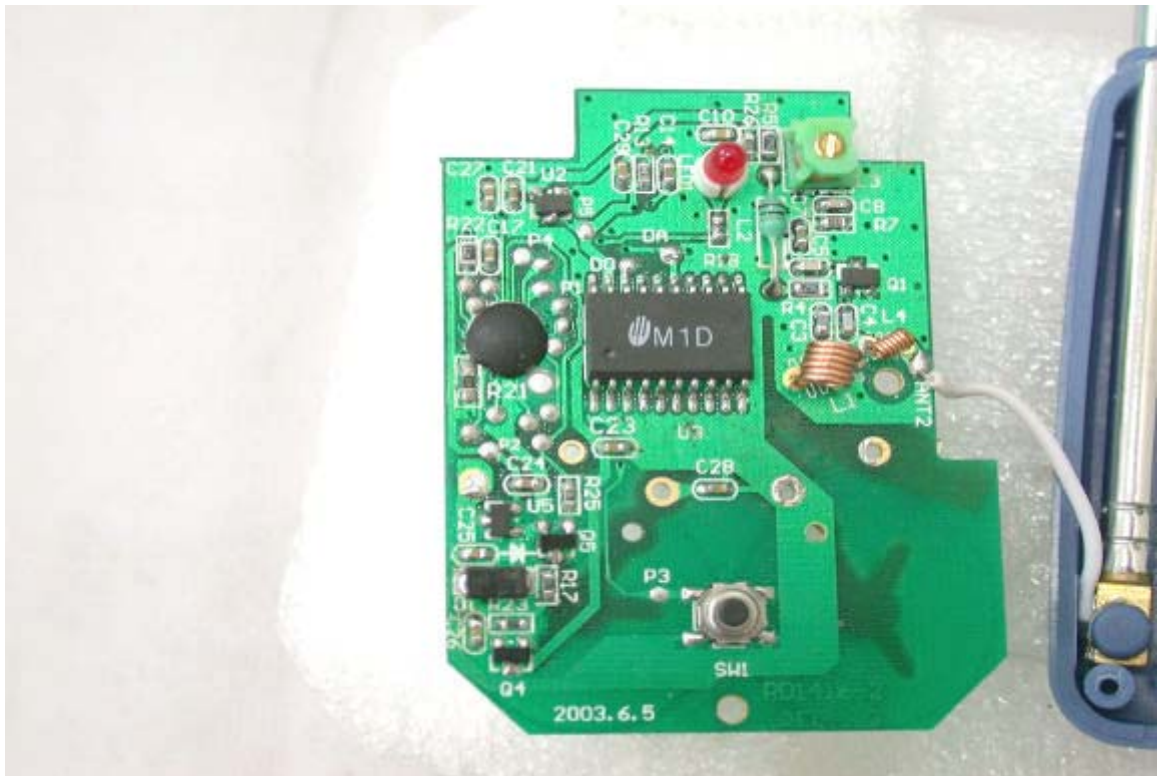
FCC ID: RFV101011AB

6. EUT Internal Photos

PHOTO. 6. EUT (RX) INSIDE VIEW



PHOTO. 7. EUT (RX) COMPONENT SIDE VIEW

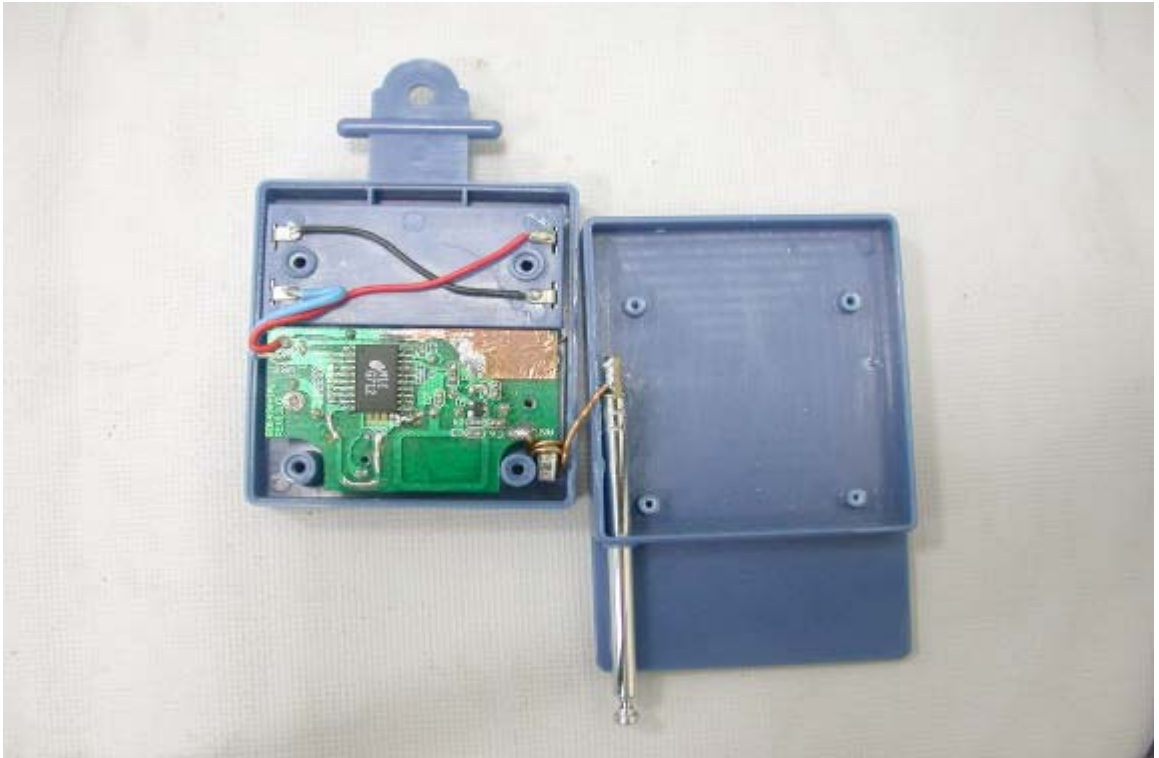


FCC ID: RFV101011AB

PHOTO. 8. EUT (RX) COMPONENT SIDE VIEW



PHOTO 9. EUT (TX) INSIDE VIEW



FCC ID: RFV101011AB

PHOTO. 10. EUT (TX) COMPONENT SIDE VIEW

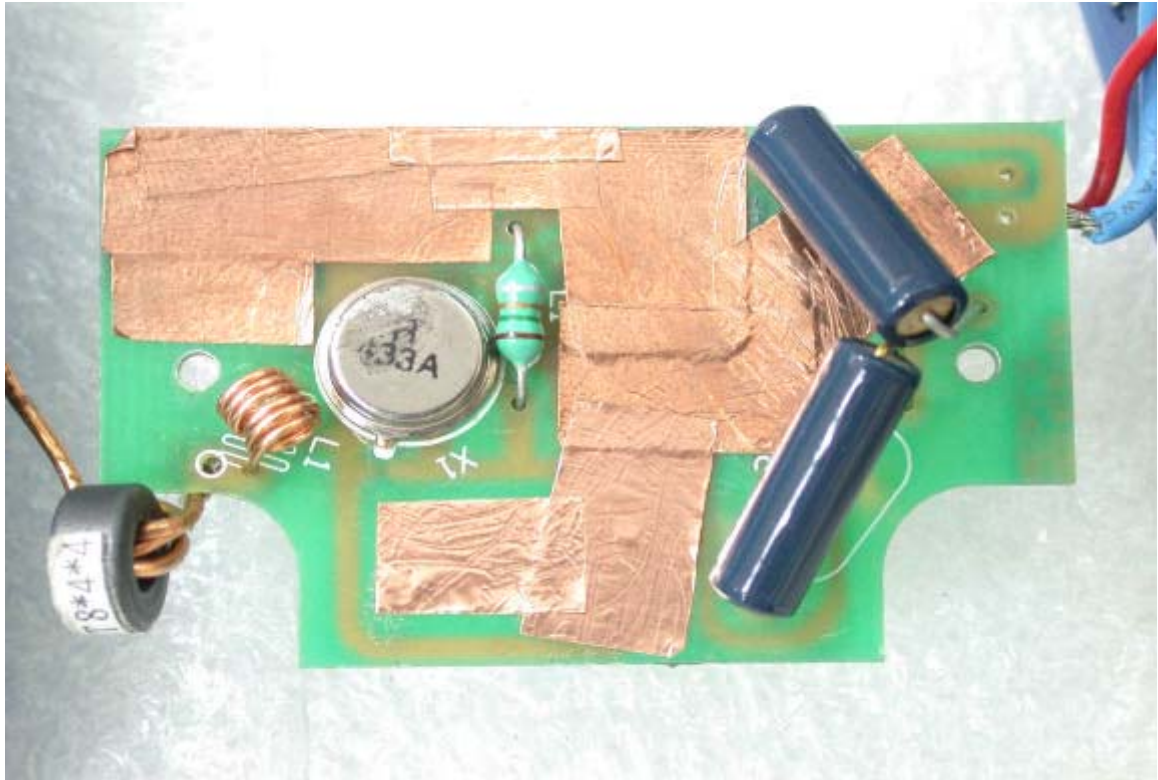
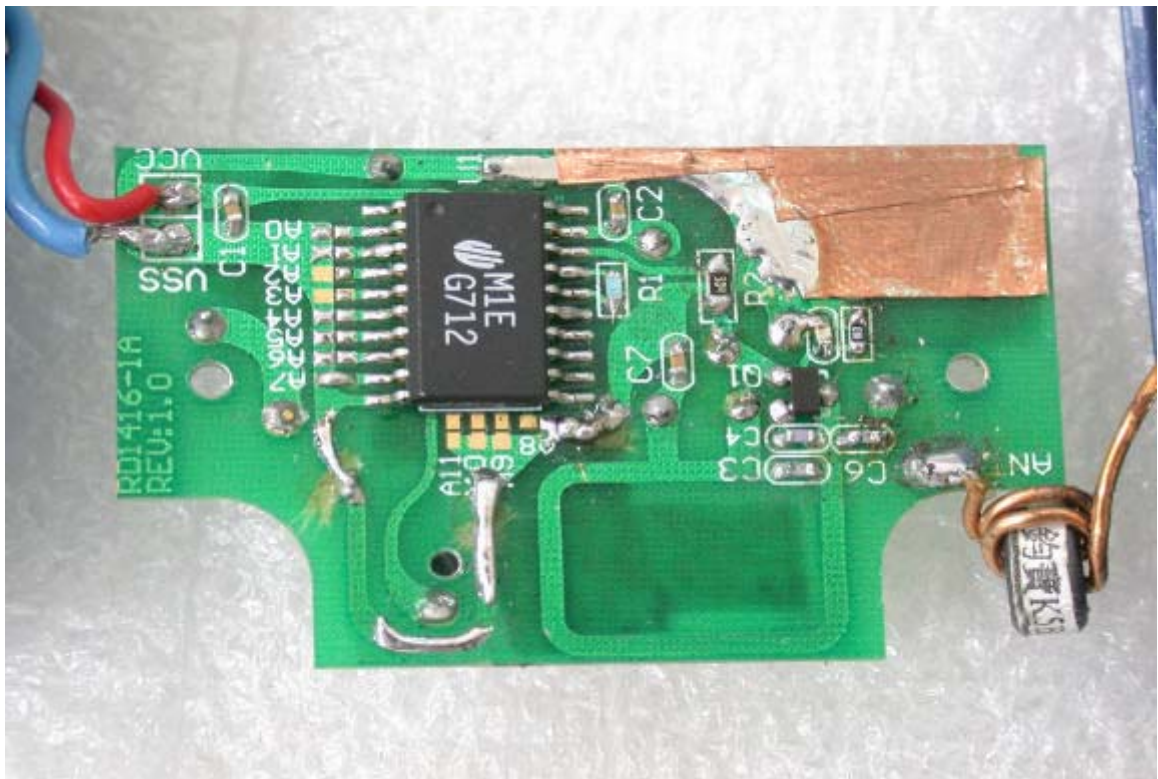


PHOTO. 11. EUT (TX) COMPONENT SIDE VIEW



VERIFICATION OF CONFORMITY FOR FCC ID

Applicant Name : TGC ENTERPRISES

Address : 38248 HILLSHIRE AVE. NORTH BRANCH MN.55056

Contact Person : WILL MECUNE / MANAGER

EUT Type : RF MODULE TRANSMITTER & RECEIVER

TX Model No.: SG1010
TX FCC ID: RFV101011AB

RX Model No.: SG1011
RX FCC ID: N/A, (under DoC)

Regulation: FCC Parts 2 and 15; Docket 95-19

Limitation: Comply with Section 15.231, Class B

Date of issued: SEP. 16, 2003

Report No.: E920416

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992. (See Test Report if any modifications were made for compliance.)

PEP declare that no party to this application has been denied the NVLAP benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).



Peter Kao/NVLAP Signatory



DECLARATION OF CONFORMITY

EUT Model: SG1011 Receiver

To be used for EUT Model: SG1010 , TRANSMITTER

Responsible Party: TGC ENTERPRISES

Address: 38248 HILLSHIRE AVE. NORTH BRANCH MN.55056

Contact Person: WILL MECUNE / MANAGER

Tel. No.: 320-269-7238 Fax No.: 320-269-6600

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired

We hereby declare that the equipment bearing the trade name and model number specified above was tested conforming to the applicable FCC Rules under the most accurate measurement standards possible, and that all the necessary steps have been taken and are in force to assure that production units of the same equipment will continue to comply with the Commission's requirements.



Signature

Date