

**MEASUREMENT/TECHNICAL REPORT****APPLICANT:** ADVANCE SECURITY INC.**MODEL NO.:** ALA-520**FCC ID:** H5OR34

This report concerns ( check one ) :      **Original Grant** ☒   
                                                              **Class II Change** ☐

**Equipment type:** 433.92MHz AUTO ALARM SYSTEM RECEIVER (Receiver)

Deferred grant requested per 47CFR 0.457(d)(1)(ii)?

Yes \_\_\_\_\_ No ☒ If yes, defer until: \_\_\_\_\_ (date)

We, the undersigned, agree to notify the Commission by (date) \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes \_\_\_\_\_ No ☒

If no, assumed Part 15, Subpart B for unintentional radiator the new 47 CFR (10-1-90 Edition) provision.

**Report Prepared**

**by Testing House :** Neutron Engineering Inc.

**for Company :**

**Name** ADVANCE SECURITY INC.

**Address** 3F., No. 48, TA AN ST., HIS CHIH CITY, TAIPEI, TAIWAN, R.O.C.

**Applicant Signature :**



**Michael Chen / President**

## CERTIFICATION

**We hereby certify that:**

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 (1992) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15, Subpart B.

Prepared by : Carol Chen



Reviewed by : Vincent Su



Approved by : George Yao



Issued Date : July 03, 1998

Report No. : NEI-FCCB-01217



Company Stamp :

**NEUTRON ENGINEERING INC.**

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## Table of Contents

|                                               |    |
|-----------------------------------------------|----|
| <b>1. General Information.....</b>            |    |
| 1-1 Product Description.....                  | 4  |
| 1-2 Related Submittal(s)/Grant(s).....        | 4  |
| 1-3 Test Methodology.....                     | 4  |
| 1-4 Test Facility.....                        | 4  |
| <b>2. System Test Configuration.....</b>      |    |
| 2-1 EUT Configuration.....                    | 5  |
| 2-2 EUT Exercise.....                         | 5  |
| 2-3 Test Procedure.....                       | 5  |
| 2-4 Limitation.....                           | 6  |
| 2-5 Special Accessories.....                  | 6  |
| 2-6 Equipment Modifications.....              | 6  |
| 2-7 Test Set-UP.....                          | 7  |
| 2-8 Test Equipment.....                       | 8  |
| <b>3. Block Dia-.....</b>                     | 9  |
| <b>4. Radiated Measurement Photos.....</b>    |    |
| 4-2 Radiated Measurement Photos.....          | 10 |
| <b>5. Radiated Emission Datas .....</b>       |    |
| 5-1 Radiated Emission Data.....               | 11 |
| 5-2 Field Strength Calculation.....           | 12 |
| 5-3 Correction Factor Table VS Frequency..... | 13 |
| <b>6. Attachment.....</b>                     |    |
| A. Photos of Tested EUT. ....                 | 14 |
| B. User Manual.....                           | 15 |

## 1. GENERAL INFORMATION

### 1-1. Product Description

The ADVANCE SECURITY INC. Model: ALA-520 (referred to as the EUT in this report) is a Receiver of car alarm security system which offers wireless remote control, ideal for use in vehicle security system to activate the function of center door lock control system and car searching except the alarm system.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 433.92 MHz
- B). Antenna Designation: Non User Replaceable (Fixed)
- C). Type : Super regenerative Receiver
- D). Power Supply : DC 12V, Battery Operated

|                       |                           |
|-----------------------|---------------------------|
| Fundamental Frequency | 433.92MHz                 |
| Power Source          | 12V Battery               |
| Transmitting Time     | Periodic $\leq 5$ seconds |
| Associated Receiver   | FCC DOC                   |

### 1-2. Related Submittal(s) / Grant (s)

This is an equipment authorization for filing, the Receiver portion of wireless remote control car alarm security system, FCC ID : H5OR34

### 1-3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance 3 meters.

### 1-4. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 132-1, Lane 329, Sec. 2, Palain Road, Shijr Jen, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Jun. 4, 1999 Submitted to your office, and accepted in a letter dated Sep. 02, 1999 (Reg. No. 95335).

## 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 normal application.

### 2-2. EUT Exercise Software

The EUT was measured according to the guidance of Section 12.1.1.1 of ANSI C63.4-1992.

A signal generator, HP model 8648A, was used to radiate an Un-modulated continuous wave (CW) signal to EUT at its operating frequency(433.92MHz) in order to “Coherere” the emissions from EUT.

### 2-3. Test Procedure

#### (1) Conducted Emissions (Not applicable in this report)

Conducted emission on the 60 Hz power interface of the EUT were measured in the frequency range of 450 KHz to 30 MHz.

The measurements was performed using a Receiver which has CISPR characteristic bandwidth and Quasi-Peak detection, and a LISN with 50 ohms / 50uH (CISPR 16) characteristics. Table-top type EUT was placed on a non-conductive table 80 cm above the horizontal ground plane (floor) and positioned at 40 cm from the vertical reference ground plane (wall of the screen room). In some case, a pre-scan using a Spectrum Analyzer was initially performed on all units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 6 dB with a Peak mode measurement, the emissions are re-measured using the receiver in Quasi-Peak mode measurement and recorded on the data sheets.

#### (2) Radiated Emissions

The EUT is placed on a turn table which is 1.0 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna which varied from 1 m to 4 m 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 EUT should be changed according to the requirements of Rule.

**2-4. Limitation****(1) Conducted Emission (Not applicable in this report)**

For a EUT which is designed to be connected to the public utility (AC) power line, the conducted emission shall not exceed the following:

| <u>Frequency<br/>(MHz)</u> | <u>Emission<br/>(uV)</u> | <u>Emission<br/>(dBuV)</u> |
|----------------------------|--------------------------|----------------------------|
| 0.45 - 30                  | 250                      | 48.0                       |

Remark : 1. Emission level in dBuV =  $20 \log (\text{uV})$

2. The limit was accordance with section 15.107 of FCC part 15, Subpart B

**(2) Radiated Emission**

The field strength of emissions from EUT shall not exceed following:

| <u>Frequency<br/>(MHz)</u> | <u>Field Strength<br/>(uV/m) @3m</u> | <u>Field Strength<br/>(dBuV/m) @3m</u> |
|----------------------------|--------------------------------------|----------------------------------------|
| 30 - 88                    | 100                                  | 40.0                                   |
| 88 - 216                   | 150                                  | 43.5                                   |
| 216 - 960                  | 200                                  | 46.0                                   |
| above 960                  | 500                                  | 54.0                                   |

Remark:

1. Emission level in dBuV/m= $20 \log (\text{uV/m})$
2. Measurement was performed at an antenna to the closed point of EUT distance of 3 meters.
3. The limit was accordance with section 15.109 of FCC part 15 Subpart B

**2-5. Special Accessories**

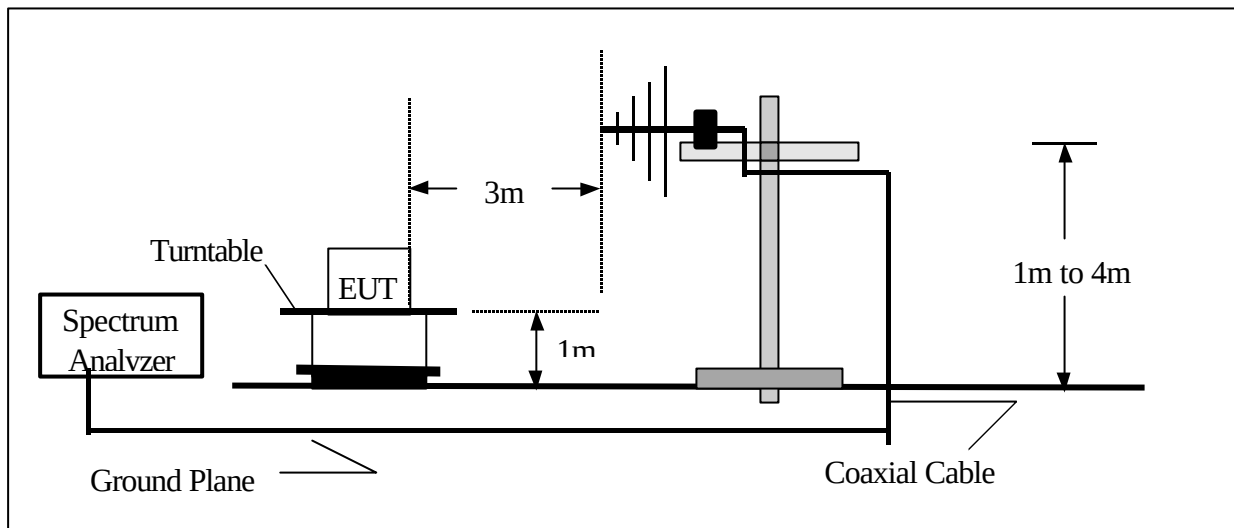
Not available for this EUT intended for grant.

**2-6. Equipment Modifications**

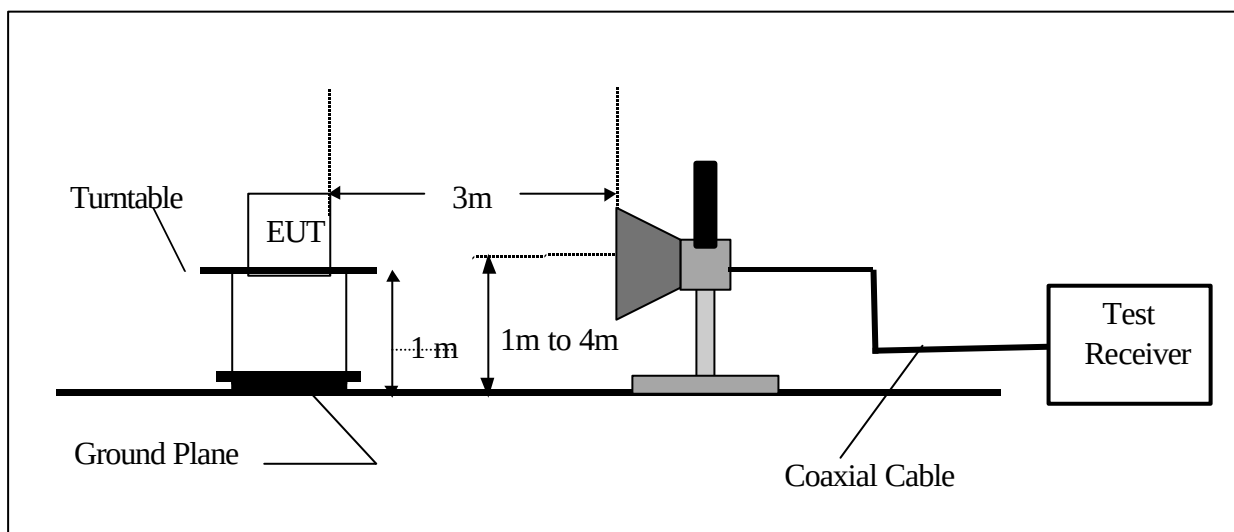
Not available for this EUT intended for grant.

## 2-7. Test SET-UP (Block Diagram of Configuration)

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



### (B) Radiated Emission Test Set-UP Frequency Over 1GHz



**2-8. Tested Equipment**

| Item | Instruments        | Mfr/Brand       | Model/Type No.  | Serial No.  | Calibrated Date | Next Cali. Date | Note      |
|------|--------------------|-----------------|-----------------|-------------|-----------------|-----------------|-----------|
| 1    | Log-Bicon Antenna  | MESS-ELEKTRONIK | VULB 9160       | 3058        | 2001-10-27      | 2002-10-26      |           |
| 2    | Log-Bicon Antenna  | MESS-ELEKTRONIK | VULB 9160       | 3060        | 2001-10-20      | 2002-10-19      | ✓         |
| 3    | Log-Bicon Antenna  | MESS-ELEKTRONIK | VULB 9161       | 4022        | 2001-07-04      | 2002-07-03      | ✓<br>(TX) |
| 4    | LISN               | EMCO            | 3825/2          | 9605-2539   | 2001-06-22      | 2002-06-21      |           |
| 5    | LISN               | Rolf Heine      | NNB-2/16Z       | 98083       | 2001-10-20      | 2002-10-19      |           |
| 6    | LISN               | Rolf Heine      | NNB-2/16Z       | 98053       | 2000-11-23      | 2001-11-22      |           |
| 7    | Horn Antenna       | EMCO            | 3115            | 9605-4803   | 2001-05-09      | 2002-05-08      |           |
| 8    | Quasi-Peak Adapter | HP              | 85650A          | 2521A00844  | 2001-09-24      | 2002-03-23      | ✓         |
| 9    | RF Pre-Selector    | HP              | 85685A          | 2648A00417  | 2001-09-24      | 2002-03-23      | ✓         |
| 10   | Spectrum Analyzer  | HP              | 85680B          | 2634A03025  | 2001-09-24      | 2002-03-23      | ✓         |
| 11   | Spectrum Monitor   | HP              | 85662B          | 2648A13616  | 2001-09-24      | 2002-03-23      | ✓         |
| 12   | Pre-Amplifier      | Anritsu         | MH648A          | M09961      | 2000-12-04      | 2001-12-03      | ✓         |
| 13   | Test Receiver      | R&S             | ESMI            | 843977/005  | 2000-11-07      | 2001-11-06      |           |
| 14   | Pre-Amplifier      | R&S             | ESMI-Z7         | 1045.5020   | 2001-05-21      | 2002-05-20      |           |
| 15   | Test Receiver      | R&S             | ESH3            | 860156/018  | 2001-10-23      | 2002-10-22      |           |
| 16   | Test Receiver      | R&S             | ESVP            | 860687/009  | 2001-10-23      | 2002-10-22      |           |
| 17   | Test Receiver      | MEB             | SMV41           | 130         | 2000-12-20      | 2001-12-19      |           |
| 18   | Absorbing Clamp    | R&S             | MDS-21          | 841077/011  | 2001-08-18      | 2002-08-17      |           |
| 19   | Voltage Probe      | R&S             | ESH2-Z3         | 841.800/023 | 2001-08-20      | 2002-08-19      |           |
| 20   | Pulse Limiter      | Electro-Metrics | EM-7600         | 112644      | 2001-02-09      | 2002-02-08      |           |
| 21   | Spectrum Analyzer  | ADVAN TEST      | R3261C          | 81720298    | 2001-08-17      | 2002-08-16      |           |
| 22   | Oscilloscope       | Tektronix       | 2465B           | J305135     | 2000-11-02      | 2001-11-01      |           |
| 23   | Impedance PAD      | HRS             | HI-NNF-PJ-50/75 | 0264        | 2001-03-15      | 2002-03-14      |           |
| 24   | Attenuator         | Stack           | 10dB            | 1           | 2001-03-15      | 2002-03-14      |           |
| 25   | Audio Generator    | Good Will       | GAG808A         | 21845       | N/A             | N/A             |           |
| 26   | Antenna Mast       | Chance Most     | CMTB-1.5        | N/A         | N/A             | N/A             | ✓         |
| 27   | Turn Table         | Chance Most     | CMTB-1.5        | N/A         | N/A             | N/A             | ✓         |
| 28   | Signal Generator   | HP              | 8648A           | 3426A01034  | 2000-02-10      | 2002-02-09      | ✓         |
| 29   | Test Receiver      | PMM             | PMM 9000        | 4310J01002  | 2000-11-26      | 2001-11-27      |           |

Remark :

- (1) ✓ indicates the instrument used in Test Report.  
(2) N/A denotes No Model No. / Serial No. and No Calibration specified.

### 3. Block Diagram(s)

#### 4. Radiated Measurement Photos

##### 4-1. Radiated Measurement Photos



## 5. Radiated Emission Datas

5-1. The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by -6.49 dB in Antenna Polarity of **Horizon** 433.51 MHz, EUT Cohered

| Freq.<br>(MHz) | Ant.<br>H/V | Reading(dBuV)<br>(Peak) | Factor | Level<br>(dBuV) | Limits<br>(dBuV) | Margins |
|----------------|-------------|-------------------------|--------|-----------------|------------------|---------|
| 109.90         | V           | 42.20                   | -12.81 | 29.39           | 43.50            | -14.11  |
| 147.30         | V           | 43.04                   | - 9.91 | 33.13           | 43.50            | -10.37  |
| 148.50         | H           | 42.50                   | - 9.83 | 32.67           | 43.50            | -10.83  |
| 161.10         | V           | 39.02                   | - 9.21 | 29.81           | 43.50            | -13.69  |
| 162.60         | H           | 42.90                   | - 9.44 | 33.46           | 43.50            | -10.04  |
| 187.60         | H           | 45.10                   | -12.36 | 32.74           | 43.50            | -10.76  |
| 202.18         | V           | 47.53                   | -12.70 | 34.83           | 43.50            | - 8.67  |
| 433.51         | H           | 44.61                   | - 5.10 | 39.51           | 46.00            | - 6.49  |
| 433.94         | V           | 40.72                   | - 5.08 | 35.64           | 46.00            | -10.36  |
| 510.48         | V           | 41.03                   | - 2.95 | 38.08           | 46.00            | - 7.92  |
| 511.45         | H           | 40.78                   | - 2.93 | 37.85           | 46.00            | - 8.15  |
| 702.94         | H           | 30.52                   | 2.32   | 32.84           | 46.00            | -13.16  |

### Remark :

- (1) Measuring frequency range from 30MHz to the 1GHz.
- (2) Test Spectrum Analyzer measurement condition setting are RBW=100KHz, VBW=100KHz, Sweep. Time=0.2 sec./MHz
- (3) Measurements made with an instrument using peak detector mode express as "Peak", Measurements made with an instrument using Average detector mode express as "AV".
- (4) \* denotes the emissions from EUT are too small to be measured.
- (5) Signal Generator used for testing is HP Model 8648A.

Review :



Test Engr. :



Data:

Jan. 04, 2002

## 5. Radiated Emission Datas

5-1. The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by -6.5 dB in Antenna Polarity of **Vertical** 1828.0 MHz, EUT Cohered

| Freq.<br>(MHz) | Ant.<br>H/V | Reading(dBuV)<br>(Peak) | Factor | Level<br>(dBuV) | Limits<br>(dBuV) | Margins |
|----------------|-------------|-------------------------|--------|-----------------|------------------|---------|
| 1011.00        | H           | 36.07                   | 7.59   | 43.66           | 54.00            | -10.34  |
| 1014.00        | V           | 36.83                   | 7.86   | 44.69           | 54.00            | - 9.31  |
| 1130.00        | H           | 34.24                   | 9.07   | 43.31           | 54.00            | -10.69  |
| 1208.00        | V           | 35.21                   | 9.13   | 44.34           | 54.00            | - 9.66  |
| 1347.00        | H           | 33.83                   | 9.81   | 43.64           | 54.00            | -10.36  |
| 1429.00        | V           | 33.38                   | 10.20  | 43.58           | 54.00            | -10.42  |
| 1827.00        | H           | 34.39                   | 12.52  | 46.91           | 54.00            | - 7.09  |
| 1828.00        | V           | 34.98                   | 12.52  | 47.50           | 54.00            | - 6.50  |

### Remark :

- (1) Measuring frequency range from 1GHz to 2GHz.
- (2) Test Spectrum Analyzer measurement condition setting are RBW=1MHz, VBW=1MHz, Sweep. Time=0.2 sec./MHz
- (3) Measurements made with an instrument using peak detector mode express as "Peak", Measurements made with an instrument using Average detector mode express as "AV".
- (4) \* denotes the emissions from EUT are too small to be measured.
- (5) Signal Generator used for testing is HP Model 8648A.

Review :



Test Engr. :



Data:

Jan. 04, 2002

## 6-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (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

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

**Remark :**

(1) The Correction Factor = AF + CL - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

### Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be calculated by

$$\text{Correction Factor} = AF + CF - AG = 7.2 + 1.1 - 0 = 8.3 \text{ (dB)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$FS = RA + \text{Correction Factor} = 23.7 + 8.3 = 32 \text{ (dBmV/m)}.$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\text{Log}^{-1} [(32.0 \text{ dBuV/m})/20] = 39.8 \text{ (uV/m)}$$

**6-3. Correction Factor VS Frequency**

| <b>Frequency (MHz)</b> | <b>Antenna Factor (dB)</b> | <b>Cable Loss (dB)</b> |
|------------------------|----------------------------|------------------------|
| 30.00                  | 11.60                      | 0.10                   |
| 35.00                  | 10.80                      | 0.20                   |
| 40.00                  | 11.20                      | 0.20                   |
| 45.00                  | 11.30                      | 0.20                   |
| 50.00                  | 11.10                      | 0.40                   |
| 55.00                  | 10.50                      | 0.50                   |
| 60.00                  | 9.90                       | 0.60                   |
| 65.00                  | 8.70                       | 0.60                   |
| 70.00                  | 7.70                       | 0.60                   |
| 75.00                  | 6.60                       | 0.60                   |
| 80.00                  | 6.30                       | 0.60                   |
| 85.00                  | 7.20                       | 0.70                   |
| 90.00                  | 8.60                       | 0.70                   |
| 95.00                  | 10.10                      | 0.70                   |
| 100.00                 | 11.40                      | 0.70                   |
| 110.00                 | 12.90                      | 0.90                   |
| 120.00                 | 13.40                      | 1.00                   |
| 130.00                 | 13.20                      | 1.00                   |
| 140.00                 | 12.50                      | 1.00                   |
| 150.00                 | 12.20                      | 1.10                   |
| 160.00                 | 13.00                      | 1.10                   |
| 170.00                 | 14.50                      | 1.10                   |
| 180.00                 | 15.90                      | 1.10                   |
| 190.00                 | 17.00                      | 1.10                   |
| 200.00                 | 17.50                      | 1.20                   |
| 225.00                 | 12.20                      | 1.20                   |
| 250.00                 | 13.30                      | 1.30                   |
| 275.00                 | 14.20                      | 1.40                   |
| 300.00                 | 15.90                      | 1.30                   |
| 325.00                 | 14.80                      | 1.40                   |
| 350.00                 | 15.90                      | 1.50                   |
| 375.00                 | 20.80                      | 1.60                   |
| 400.00                 | 17.10                      | 1.60                   |
| 450.00                 | 18.10                      | 1.70                   |
| 500.00                 | 19.40                      | 1.60                   |
| 550.00                 | 19.70                      | 2.00                   |
| 600.00                 | 20.10                      | 2.10                   |
| 650.00                 | 21.00                      | 2.00                   |
| 700.00                 | 22.30                      | 2.30                   |
| 750.00                 | 22.20                      | 2.40                   |
| 800.00                 | 22.20                      | 2.50                   |
| 850.00                 | 23.50                      | 2.50                   |
| 900.00                 | 24.30                      | 2.70                   |
| 950.00                 | 24.60                      | 2.60                   |
| 1000.00                | 25.70                      | 2.80                   |

## Attachment A

### Photos of Tested EUT

1. Photo EUT 1.      Front View Rear View
2. Photo EUT 2-7.    Unit partially Disassembled

# Attachment B

## User Manual