Advanced
Compliance Laboratory

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# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

RF LOCATOR
MODEL: VC-3010X
FCC ID: SZPVC-3010X

*February 25, 2005*

This report concerns (check one): Original grant __x__ Class II change _____
Equipment type: Low Power Intentional Radiator

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes _____ no __x__
If yes, defer until: _____ (date)
Company agrees 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 __x__
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR [10-1-90 Edition] provision.

| | |
|---|---|
| Report prepared for: | V-CARE DEVELOPMENT |
| Report prepared by: | Advanced Compliance Lab |
| Report number: | 0048-050215-01 |

NVLAP

**The test result in this report IS supported and covered by the NVLAP accreditation**

# Table of Contents

# Figures

# 1. GENERAL INFORMATION

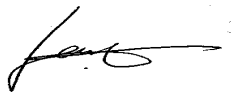
## 1.1 Verification of Compliance

| | |
|---|---|
| EUT: | RF LOCATOR |
| Model: | VC-3010X |
| Applicant: | V-CARE DEVELOPMENT.<br>RM 2701, 27/F.,TREND CENTRE<br>29-31 CHEUNG LEE ST.<br>CHAI WAN, HONG KONG |
| Test Type: | FCC Part 15C CERTIFICATION |
| Result: | PASS |
| Tested by: | ADVANCED COMPLIANCE LABORATORY |
| Test Date: | February 23, 2005 |
| Report Number: | 0048-050215-01 |

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. 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.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

| | Prob. Dist. | Uncertainty(dB) | Uncertainty(dB) | Uncertainty(dB) |
|---|---|---|---|---|
| | | 30-1000MHz | 1-6.5GHz | Conducted |
| Combined Std. Uncertainty $u_c$ | norm. | ±2.36 | ±2.99 | ±1.83 |



Wei Li
Lab Manager
Advanced Compliance Lab

Date: February 25, 2005

## 1.2 Equipment Modifications

N/A

## 1.3 Product Information

**System Configuration**

| ITEM | DESCRIPTION | FCC ID | CABLE |
|---|---|---|---|
| Product | RADIO CONTROL CAR TRANSMITTER VC-3010X (1) | SZPVC-3010X | |
| Housing | PLASTICS | | |
| Power Supply | 6V DC Battery | | |
| Clock/OSC Freq. | 433.9 MHz | | |
| Receiver | VC-3010X (RX) | | |

(1) EUT submitted for grant.

## 1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2001 at an antenna to EUT distance of 3 meters.

## 1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

## 1.6 Test Equipment

| Manufacture | Model | Serial No. | Description | Last Cal dd/mm/yy | Cal Due dd/mm/yy |
|---|---|---|---|---|---|
| Hewlett-Packard | HP8546A | 3448A00290 | EMI Receiver | 12/01/05 | 12/01/06 |
| EMCO | 3104C | 9307-4396 | 20-300MHz Biconical Antenna | 12/02/05 | 12/02/06 |
| EMCO | 3146 | 9008-2860 | 200-1000MHz Log-Periodic Antenna | 09/02/05 | 09/02/06 |
| Fischer Custom | LISN-2 | 900-4-0008 | Line Impedance Stabilization Networks | 23/08/04 | 23/08/05 |
| Fischer Custom | LISN-2 | 900-4-0009 | Line Impedance Stabilization Networks | 23/08/04 | 23/08/05 |
| EMCO | 6502 | 2665 | 10KHz-30MHz Active Loop Antenna | 27/02/04 | 27/02/05 |
| EMCO | 3115 | 4945 | Double Ridge Guide Horn Antenna | 11/08/04 | 11/08/05 |

All Test Equipment Used are Calibrated Traceable to NIST Standards.

### 1.7 Statement for the Document Use

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

## 2. PRODUCT LABELING

**FCC ID: SZPVC-3010X**

**This device complies with part 15 of the FCC Rules. Operating 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 operation.**

**Figure 2.1 FCC ID Label**


**Figure 2.2 Location of the Label**

# 3. SYSTEM TEST CONFIGURATION

## 3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). And its antenna was permanently on PCB Board.

This manually operated transmitter will deactivate within 5s after any control switch was released.

Testing was performed as EUT was operated at frequency channel 433.9MHz continuously.

## 3.2 Special Accessories

N/A

## 3.3 Configuration of Tested System

Figure 3.1 to Figure 3.3 illustrate this system, which is tested standing along.

**Figure 3.1 Radiated Test Setup, position 1**

**Figure 3.2 Radiated Test Setup, position 2**

**Figure 3.3 Radiated Test Setup, position 3**

# 4. SYSTEM SCHEMATICS

**See attachment.**

**Figure 4.1 System Schematics**

# 5. RADIATED EMISSION DATA

## 5.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dBμV/m
RA: Amplitude of EMI Receiver before correction in dBμV
AF: Antenna Factor in dB/m
CF: Cable Attenuation Factor in dB
AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

## 5.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz, 120KHz IF bandwidth / 120KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. Up to $10^{th}$ harmonics were investigated.

## 5.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Test Personnel: 

Typed/Printed Name: Edward Lee Date: February 25, 2005

## Radiated Test Data

| Frequency (MHz) | Polarity [H or V], Position (X,Y,Z) | Height (m) | Azimuth (Degree) | Peak Reading (dBμV/m) | Calculated Average Reading (4) (dBμV/m) | FCC 3m Limit (dBμV/m) | Difference from limit (dB) |
|---|---|---|---|---|---|---|---|
| 433.9 | X,H | 1.4 | 80 | 70.3 | | 80.8(2) | -10.5 |
| 867.8 | X,H | 1.4 | 80 | 38.4 | | 60.8(3) | -22.4 |
| 1301.7 | X,H | 1.3 | 90 | 46.7 | | 54.0(1) | -7.3 |
| 1735.6 | X,H | 1.3 | 80 | 45.0 | | 60.8 | -15.8 |
| 433.9 | X,V | 1.2 | 20 | 68.7 | | 80.8 | -12.1 |
| 867.8 | X,V | 1.2 | 30 | 39.0 | | 60.8 | -21.8 |
| 1301.7 | X,V | 1.2 | 30 | 45.2 | | 54.0 | -8.8 |
| 433.9 | Y,H | 1.4 | 70 | 74.6 | | 80.8 | -6.2 |
| 867.8 | Y,H | 1.4 | 80 | 38.0 | | 60.8 | -22.8 |
| 1301.7 | Y,H | 1.3 | 80 | 45.4 | | 54.0 | -8.6 |
| 433.9 | Y,V | 1.2 | 30 | 72.9 | | 80.8 | -7.9 |
| 867.8 | Y,V | 1.2 | 30 | 39.0 | | 60.8 | -21.8 |
| 1301.7 | Y,V | 1.2 | 40 | 45.0 | | 54.0 | -9 |
| 1735.6 | Y,V | 1.2 | 30 | 44.1 | | 60.8 | -16.7 |
| 433.9 | Z,H | 1.4 | 20 | 73.9 | | 80.8 | -6.9 |
| 867.8 | Z,H | 1.3 | 20 | 39.0 | | 60.8 | -21.8 |
| 1301.7 | Z,H | 1.3 | 30 | 48.2 | | 54.0 | -5.8 |
| 1735.6 | Z,H | 1.3 | 20 | 46.6 | | 60.8 | -14.2 |
| 433.9 | Z,V | 1.2 | 10 | 75.5 | | 80.8 | -5.3 |
| 867.8 | Z,V | 1.2 | 20 | 39.6 | | 60.8 | -21.2 |
| 1301.7 | Z,V | 1.2 | 350 | 47.2 | | 54.0 | -6.8 |
| 1735.6 | Z,V | 1.2 | 350 | 46.0 | | 60.8 | -14.8 |

(1) Restricted band.
(2) Fundamental limit is 3750-12500 microvolts/meter linear interpolations.
(3) Spurious limit is 375-1250 microvolts/meter linear interpolations.
(4) It's not needed when the peak reading is under the limit.

### 5.4 Occupied Bandwidth

The bandwidth of the emission shall be no wider than 0.25% of the center frequency, in this case, 1.085MHz(433.9x0.25%). Bandwidth is determined at the points 20dB down from the modulated carrier. Figure 5.2 shows the occupied bandwidth plot.

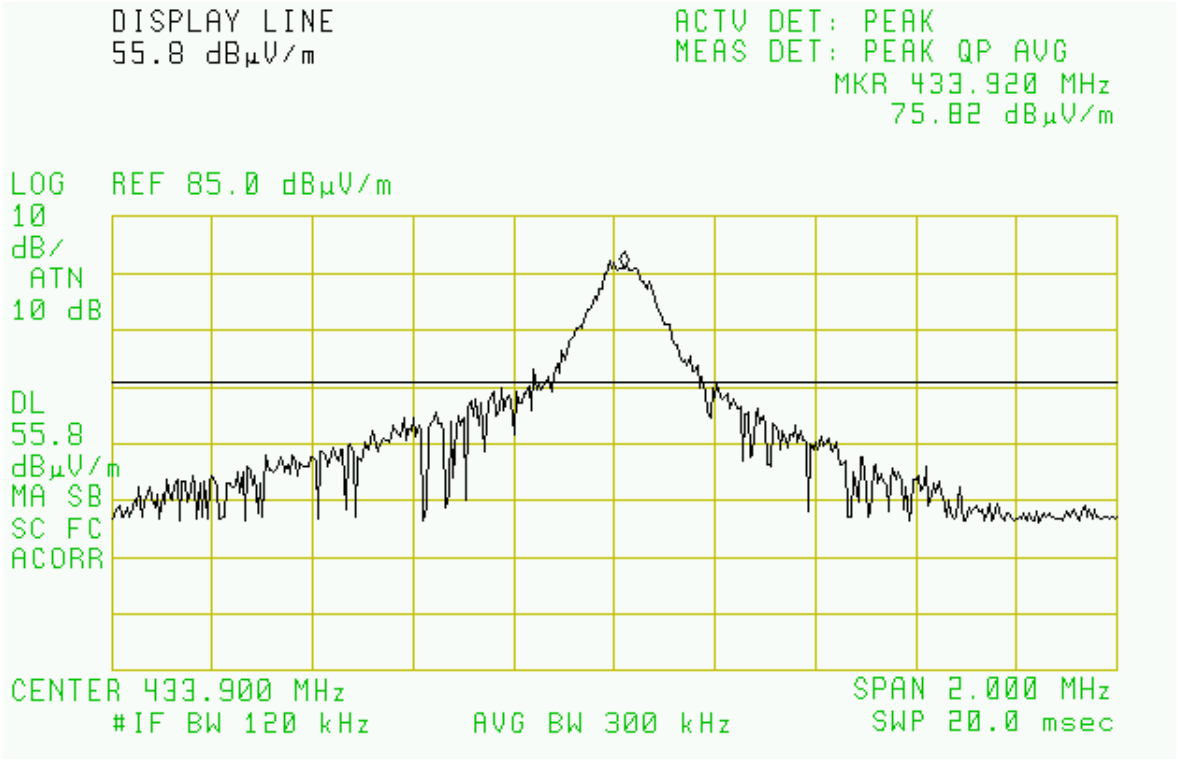



**Figure 5.1 Occupied Bandwidth**

## 6. PHOTOS OF TESTED EUT

The following photos show the inside details of the EUT.