

# FCC ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT CERTIFICATION TO FCC PART 15 REQUIREMENTS

for

**INTENTIONAL RADIATOR**

of

**Car Alarm Transmitter**

**FCC ID Number** : H5OT20

**Trade Name** : Advance Security Inc.

**Model Number** : TX552S

**Agency Series** : N/A

**Report Number** : C30818402-RP

**Date** : August 22, 2003

Prepared for :

**Advance Security Inc.**

**3F, 48 Ta An Street, Hsi Chih,**

**Taipei Hsien, Taiwan, R.O.C.**

Prepared by :

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Lab. Code: 200617-0



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**1. VERIFICATION OF COMPLIANCE**

COMPANY NAME : Advance Security Inc.  
3F, 48 Ta An Street, Hsi Chih,  
Taipei Hsien, Taiwan, R.O.C.

CONTACT PERSON : Michael Chen / President

TELEPHONE NO. : (886-2) 8648-1688

EUT DESCRIPTION : Car Alarm Transmitter

MODEL NAME/NUMBER : TX552S

FCC ID : H5OT20

DATE TESTED : August 19, 2003

REPORT NUMBER : C30818402-RP

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	433.92 MHz Car Alarm Transmitter
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15

The above equipment was tested by C&C Laboratory Co., Ltd. for compliance with the requirements set forth in the FCC CFR 47, PART 15. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. **Warning:** This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Engineering Services, Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by C&C Laboratory Co., Ltd. will constitute fraud and shall nullify the document.

Vince Chiang / Supervisor  
C&C Laboratory Co., Ltd.

## 2. PRODUCT DESCRIPTION

Fundamental Frequency	<b>433.92 MHz</b>
Power Source	<b>12V Battery</b>
Transmitting Time	<b>Periodic <math>\leq</math> 5 seconds</b>
Associated Receiver	<b>Model: GOH-PAN06</b>

## 3. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at No. 165 & No. 199, Chung Sheng Road, Hsin Tien City, Taipei, Taiwan R.O.C. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 4. MEASUREMENT STANDARDS

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/1992.

## 5. TEST METHODOLOGY

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (CFR 47 Section 15.33)

**6. MEASUREMENT EQUIPMENT USED**

<b>Manufacturer</b>	<b>Model Number</b>	<b>Description</b>	<b>Cal Due Date</b>
R&S	DSAI-D 804.8932.52	EMI TEST DISPLAY	12/18/03
R&S	ESBI-RF/1005.4300.52	EMI TEST RF UNIT	12/18/03
SCHWARZBECK	VULB 9160	ANTENNA	05/09/04
BELDEN	9913	CABLE	04/06/04
H.P.	8447D B	PRE-AMPLIFIER	05/03/04
EMCO	3115	ANTENNA (1-18GHz)	02/24/04
HP	8449B	AMPLIFIER (1-26.5GHz)	02/20/04
HUBER+SUHNER	SUCOFLEX 104	CABLE (1-18GHz)	02/20/04
JYEBAO	LL143	CABLE (1-18GHz)	02/20/04
JYEBAO	LL142	CABLE (1-18GHz)	02/20/04
HP	8566B	EMC ANALYZER (100Hz-22GHz)	06/25/04

**7. POWERLINE RFI LIMIT**

CONNECTED TO AC POWER LINE	SECTION 15.207
CARRIER CURRENT SYSTEM IN THE FREQUENCY RANGE OF 450 KHz TO 30 MHz	SECTION 15.205 AND SECTION 15.209, 15.221, 15.223, 15.225 OR 15.227, AS APPROPRIATE.
BATTERY POWER	NO REQUIRED.

## 8. RADIATED EMISSION LIMITS

GENERAL REQUIREMENTS	SECTION 15.209
RESTRICTED BANDS OF OPERATION	SECTION 15.205
PERIODIC OPERATION IN THE BAND 40.66 -40.70 MHz AND ABOVE 70 MHz.	SECTION 15.231

## 9. SYSTEM TEST CONFIGURATION

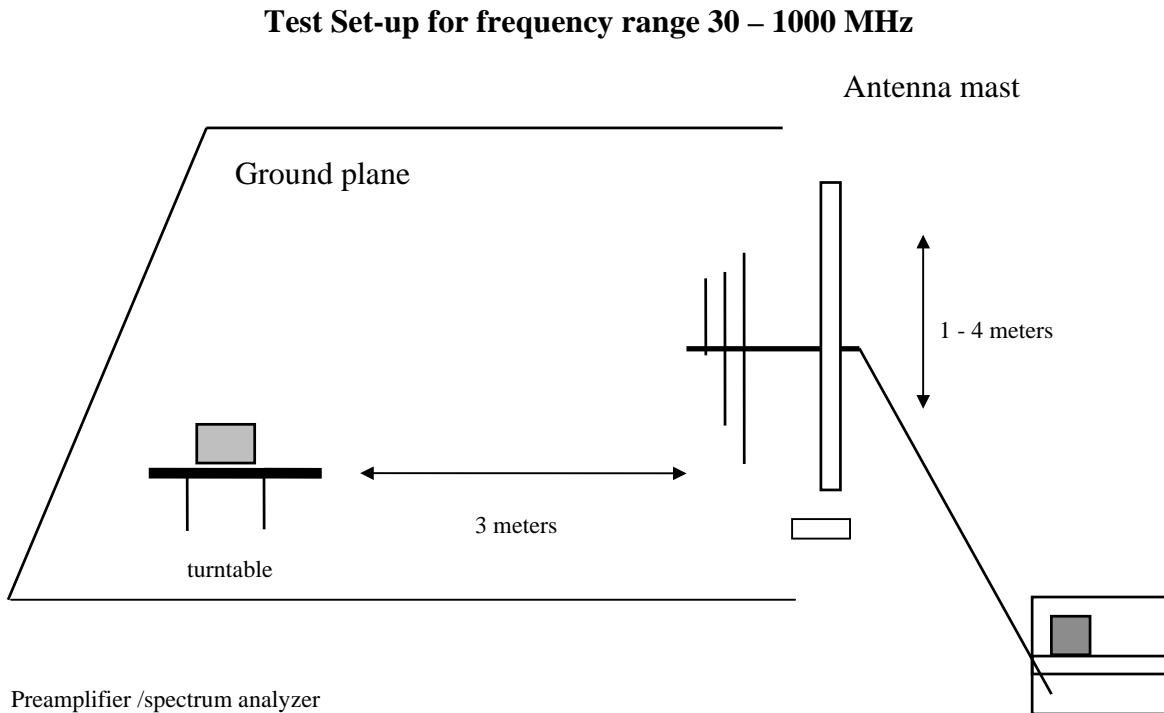
Use a block of foam and combined it with EUT wrapping rubber band around it. This way it can test X.Y, and Z axis. To activate continuous transmission, place a small plastic block between rubber band and EUT push button.



**Radiated Open Site Test Set-up**

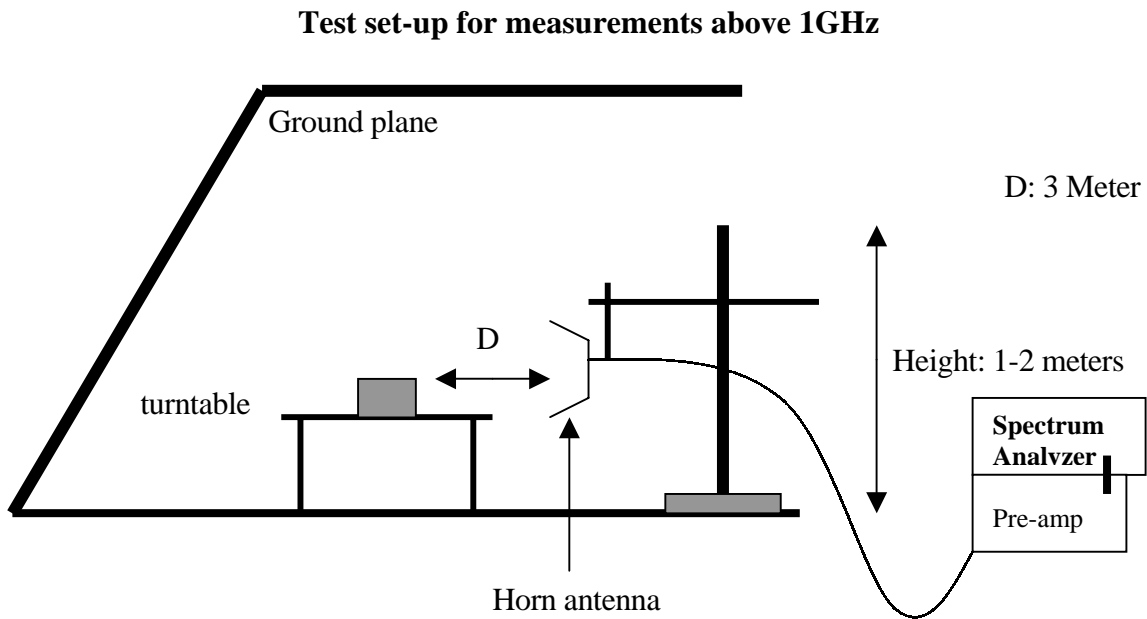
## 10. TEST PROCEDURE

### Radiated Emissions, 15.231(4)(b)



**Fig. 1**

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3-meters from the EUT.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.



1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 1-meters from the EUT. The EUT antenna was mounted vertically as per normal installation.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

## 11. Equipment Modifications

To achieve compliance to FCC Section 15.231 technical limits, the following change(s) were made during compliance testing:

**NONE**



## 12. TEST RESULT

Powerline RFI Class B	Eut	Radiated Emission Limits	Eut
SECTION 15.207		SECTION 15.209	X
SECTION 15.205, 15.209, 15.221, 15.223, x 15.225 OR 15.227		SECTION 15.205	
BATTERY POWER	X	SECTION 15.231 (b)	X
		SECTION 15.231 (e)	

### 12.1 Maximum Modulation Percentage (M%)

CALCULATION:

$$\text{Average Reading} = \text{Peak Reading (dBuV/m)} + 20 \log (\text{Duty Cycle})$$

In order to determine possible Maximum Modulation percentage, alternations are made to the EUT.  
We measured:

WHERE 1 Period = 94.90 mS  
 Long pulse = 1.01 mS  
 Short pulse = 0.25 mS  
 No of Long pulse = 34  
 No of Short pulse = 22

$$\text{Duty Cycle} = (N_1L_1 + N_2L_2 + \dots + N_{n-1}L_{n-1} + N_nL_n) / 100 \text{ or } T$$

$$\text{Duty Cycle} = [(34 \times 1.01) + (22 \times 0.25)] / 94.9 = 0.4198 = 41.98 \% \text{ or } -7.5392 \text{dB}$$

### 12.2 The Emissions Bandwidth

The bandwidth of the emissions were investigated per 15.231(c)

Center Frequency	Measured	Limits
433.92 MHz	386.0 kHz < (refer to plot)	433.92 MHz X 0.25% = 1084.8 kHz



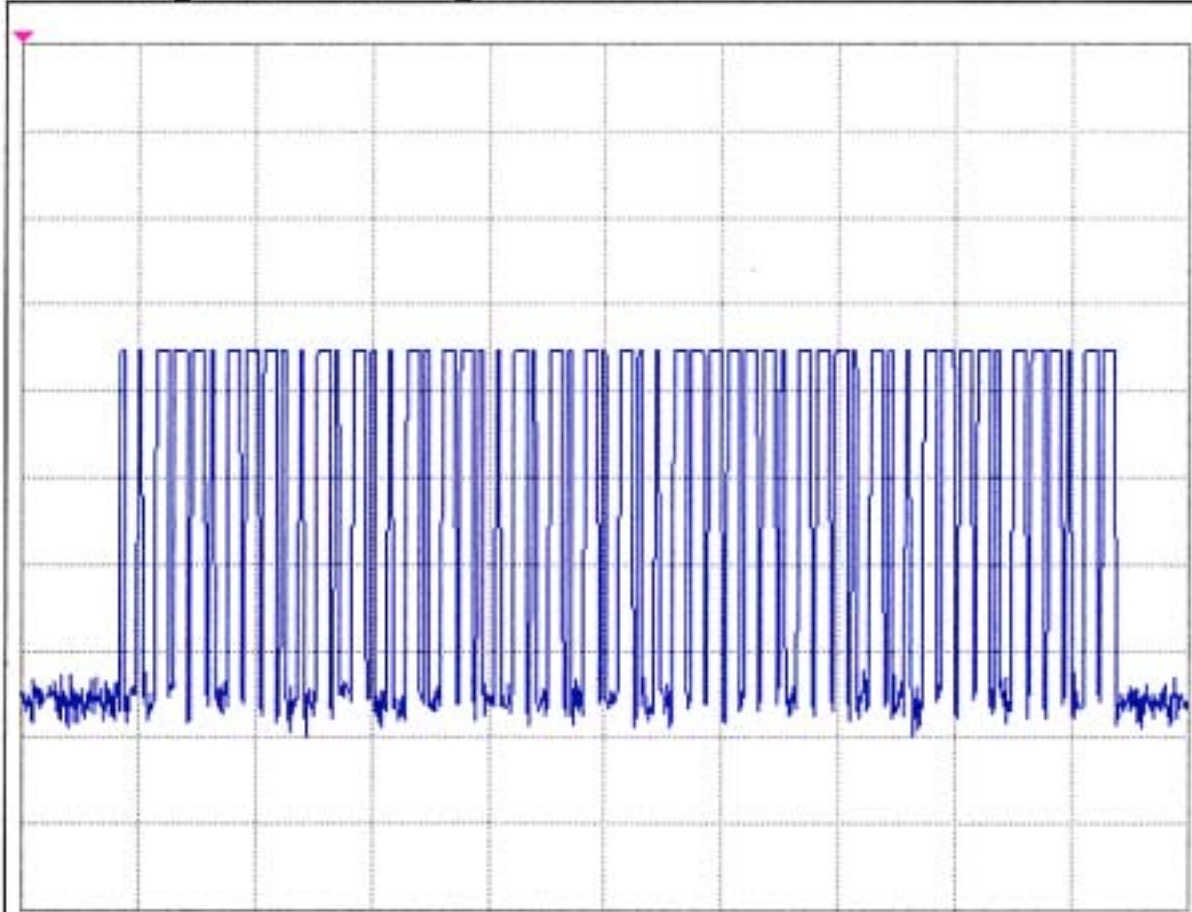
## **APPENDIX 2**

## **TEST DATA**

Tue 2003 Aug 19 10:06

REF 97.0 dB $\mu$ V

10dB/ A\_Write Posi B\_Blank Posi



CENTER 434.000000 MHz SPAN 0.000 kHz  
\*RBW 100 kHz \*VBW 100 kHz \*SWP 100 ms \*ATT 10dB

Tue 2003 Aug 19 09:58

REF 97.0 dB $\mu$ V

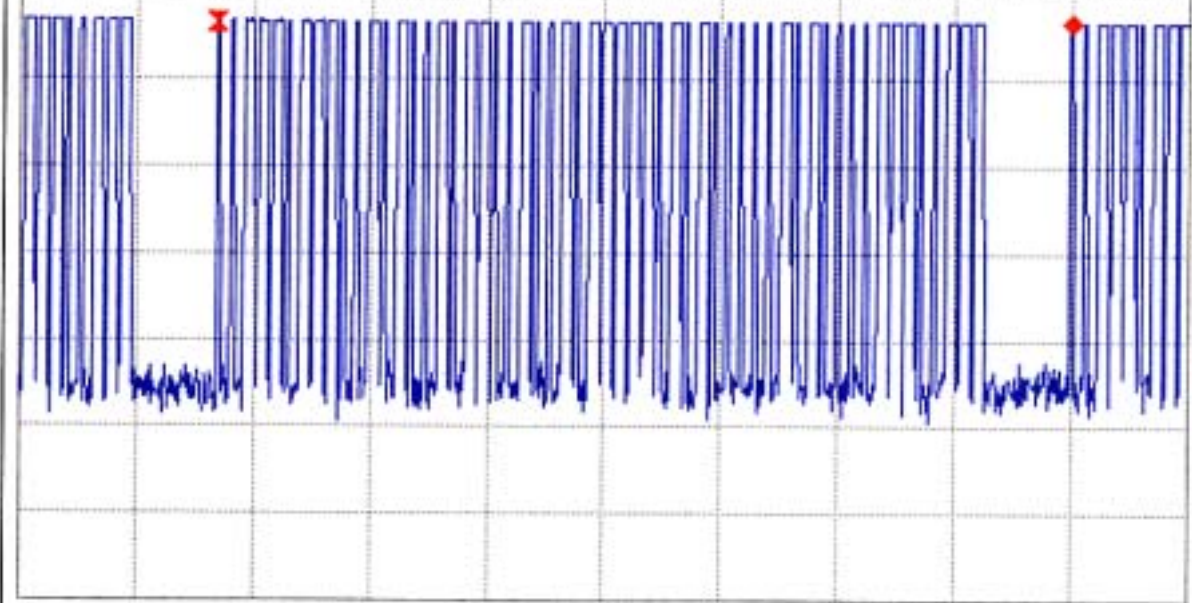
MK $\Delta$  94.90 ms

10dB/

A\_Write Posi B\_Blank Posi

-0.08 dB

DELTA MKR  
94.90 ms



CENTER 434.000000 MHz

SPAN 0.000 kHz

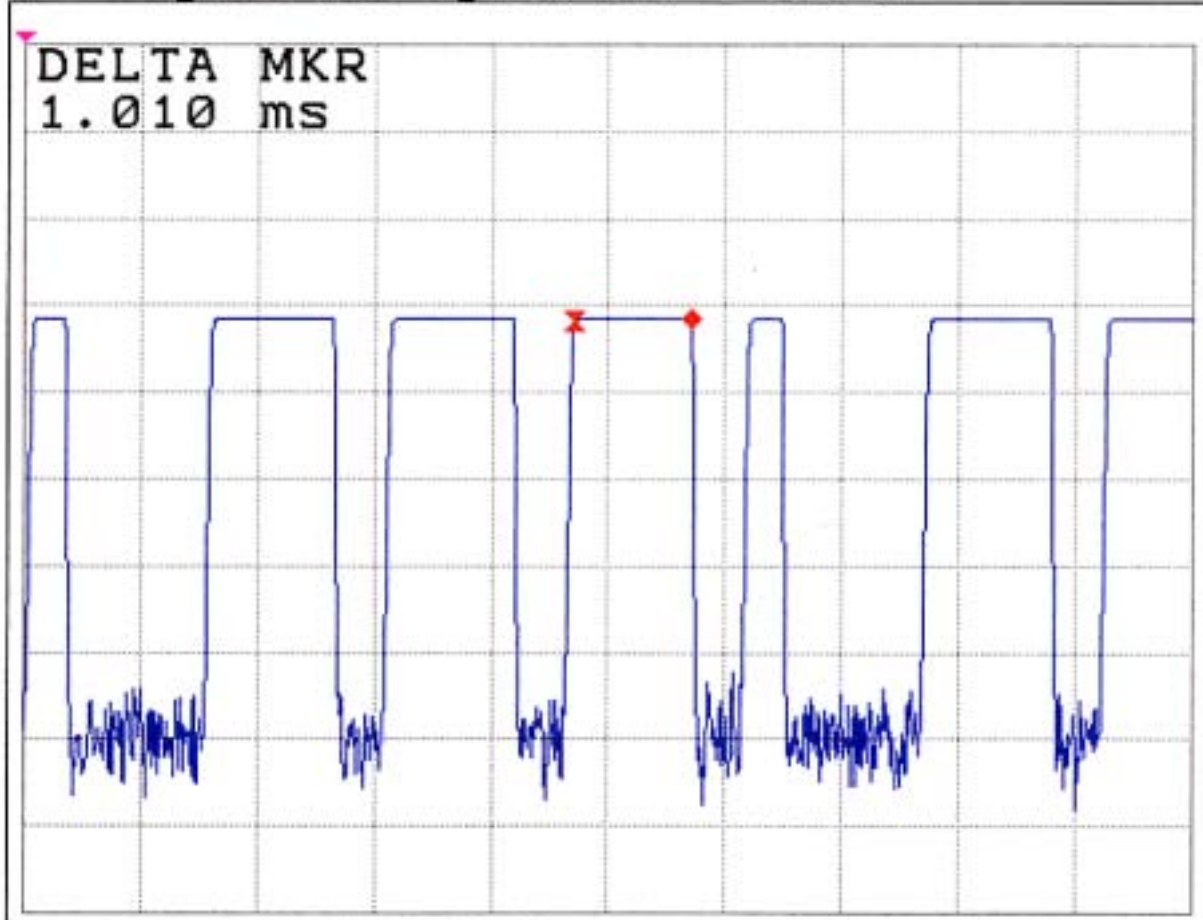
\*RBW 100 kHz \*VBW 100 kHz \*SWP 130 ms \*ATT 10dB

Tue 2003 Aug 19 10:14

REF 97.0 dB $\mu$ V  
10dB/

MK $\Delta$  1.010 ms  
0.23 dB

DELTA MKR  
1.010 ms



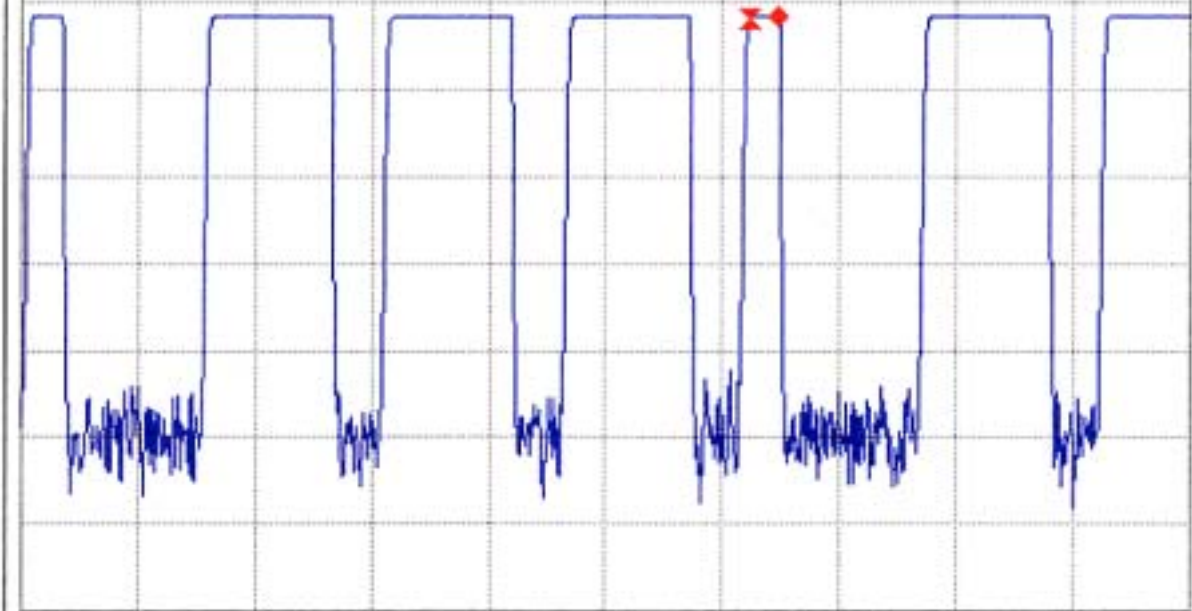
CENTER 434.000000 MHz SPAN 0.000 kHz  
\*RBW 100 kHz \*VBW 100 kHz \*SWP 10 ms \*ATT 10dB

Tue 2003 Aug 19 10:19

REF 97.0 dB $\mu$ V  
10dB/

MK $\Delta$  250.0  $\mu$ s  
0.26 dB

DELTA MKR  
250.0  $\mu$ s

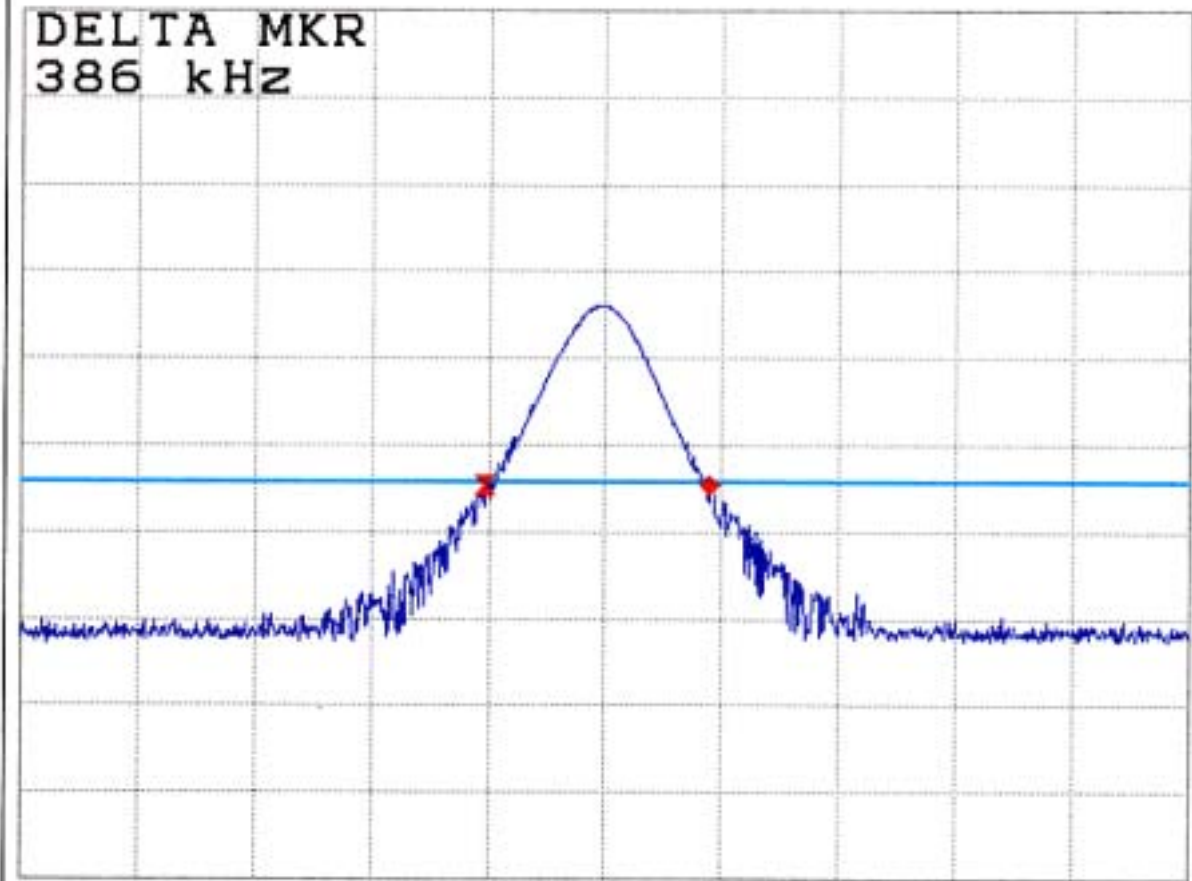


CENTER 434.000000 MHz SPAN 0.000 kHz  
\*RBW 100 kHz \*VBW 100 kHz \*SWP 10 ms \*ATT 10dB

Tue 2003 Aug 19 09:50

REF 97.0 dB $\mu$ V    DL 43.0 dB $\mu$ V    MK $\Delta$  386 kHz  
10dB/    A\_Max    Posi    B\_Blank    Posi    -0.16 dB

DELTA MKR  
386 kHz



CENTER 434.000 MHz    SPAN 2.000 MHz  
\*RBW 100 kHz    \*VBW 100 kHz    SWP 20 ms    \*ATT 10dB

# C&C Laboratory CO., LTD.

FCC, VCCI, CISPR, CE, AUSTEL, NZ  
UL, CSA, TUV, BSMI, DHHS, NVLAP

No. 165, Chung Sheng Road,  
Hsin Tien City, Taipei, Taiwan, R.O.C.  
PHONE: 02-2217-0894 FAX: 02-2217-1029

**Project #:** C30818402  
**Report #:** C30818402-RP  
**Date & Time:** 2003/08/19  
**Test Engr:** ALEX PAN

**Company:** Advance Security Inc.  
**EUT Description:** TX552S (433.92 MHz / Car Alarm Transmitter)  
**Test Configuration :** EUT ONLY  
**Type of Test:** FCC 15.231(b)  
**Mode of Operation:** Normal Mode

D-Site

$$M\% = ((t1+t2+t3+\dots)/T) * 100\% = 41.98 \%$$

$$\begin{aligned} \text{Av Reading} &= \text{Pk Reading} + 20 * \log(M\%) \\ 20 * \log(M\%) &= -7.5392 \end{aligned}$$

	Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)
	Button #1:											
X	434.00	51.50	43.96	17.15	2.62	27.00	36.73	80.83	-44.10	3mV	0	1.60
	867.99	37.04	29.50	24.01	3.95	26.74	30.72	60.83	-30.11	3mV	90	1.00
Y	434.00	60.81	53.27	17.15	2.62	27.00	46.04	80.83	-34.79	3mV	180	1.20
	867.99	44.40	36.86	24.01	3.95	26.74	38.08	60.83	-22.75	3mV	270	1.80
Z	433.99	65.78	58.24	17.15	2.62	27.00	51.01	80.83	-29.82	3mV	90	1.00
	867.99	44.30	36.76	24.01	3.95	26.74	37.98	60.83	-22.85	3mV	180	1.50
X	434.01	59.84	52.30	17.15	2.62	27.00	45.07	80.83	-35.76	3mH	270	1.20
	868.02	43.34	35.80	24.01	3.95	26.74	37.02	60.83	-23.81	3mH	0	1.00
Y	434.01	63.45	55.91	17.15	2.62	27.00	48.68	80.83	-32.15	3mH	180	1.20
	868.02	43.77	36.23	24.01	3.95	26.74	37.45	60.83	-23.38	3mH	90	1.80
Z	433.99	58.67	51.13	17.15	2.62	27.00	43.90	80.83	-36.93	3mH	180	1.00
	868.01	43.44	35.90	24.01	3.95	26.74	37.12	60.83	-23.71	3mH	90	1.60

Peak: RBW= 100KHz  
VBW= 300KHz  
A(Average): Pk Reading - 7.5392dB

Total Data #12



# C&C Laboratory CO., LTD.

FCC, VCCI, CISPR, CE, AUSTEL, NZ  
UL, CSA, TUV, BSMI, DHHS, NVLAP

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**Test Configuration :** EUT ONLY  
**Type of Test:** FCC 15.231(b)  
**Mode of Operation:** Normal Mode

D-Site

$$M\% = ((t1+t2+t3+\dots)/T) * 100\% = 41.98 \%$$

$$Av \text{ Reading} = Pk \text{ Reading} + 20 * \log(M\%)$$

$$20 * \log(M\%) = -7.5392$$

	Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)
	Button #2:											
X	433.99	60.02	52.48	17.15	2.62	27.00	45.25	80.83	-35.58	3mV	90	1.80
	868.02	42.04	34.50	24.01	3.95	26.74	35.72	60.83	-25.11	3mV	270	1.60
Y	434.01	61.95	54.41	17.15	2.62	27.00	47.18	80.83	-33.65	3mV	90	1.20
	868.02	46.18	38.64	24.01	3.95	26.74	39.86	60.83	-20.97	3mV	180	1.20
Z	434.01	65.51	57.97	17.15	2.62	27.00	50.74	80.83	-30.09	3mV	90	1.00
	868.00	50.83	43.29	24.01	3.95	26.74	44.51	60.83	-16.32	3mV	270	1.50
X	434.00	58.47	50.93	17.15	2.62	27.00	43.70	80.83	-37.13	3mH	180	1.50
	867.99	42.96	35.42	24.01	3.95	26.74	36.64	60.83	-24.19	3mH	90	1.00
Y	433.98	57.30	49.76	17.15	2.62	27.00	42.53	80.83	-38.30	3mH	0	1.50
	868.02	42.52	34.98	24.01	3.95	26.74	36.20	60.83	-24.63	3mH	270	1.80
Z	433.98	57.30	49.76	17.15	2.62	27.00	42.53	80.83	-38.30	3mH	180	1.30
	867.99	43.77	36.23	24.01	3.95	26.74	37.45	60.83	-23.38	3mH	270	1.60

Peak: RBW= 100KHz  
VBW= 300KHz  
A(Average): Pk Reading - 7.5392dB

Total Data #12

# C&C Laboratory CO., LTD.

FCC, VCCI, CISPR, CE, AUSTEL, NZ  
UL, CSA, TUV, BSMI, DHHS, NVLAP

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**EUT Description:** TX552S (433.92 MHz / Car Alarm Transceiver)  
**Test Configuration :** EUT ONLY  
**Type of Test:** FCC 15.231(b)/FCC 15.209  
**Mode of Operation:** Transmitter Mode

D-Site

Freq.	Pk Rdg	Av Rdg	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
1302	52.30	44.76	25.19	4.75	32.04	42.66	54.00	-11.34	3mV	180	1.1	A
1736	48.80	41.26	26.43	5.58	32.76	40.51	60.83	-20.32	3mV	90	1.0	A
2169	44.00	36.46	27.76	6.25	33.15	37.32	60.83	-23.51	3mV	90	1.2	A
1302	52.30	44.76	25.19	4.75	32.04	42.66	54.00	-11.34	3mH	90	1.1	A
1736	46.90	39.36	26.43	5.58	32.76	38.61	60.83	-22.22	3mH	0	1.0	A
2170	44.50	36.96	27.76	6.25	33.15	37.82	60.83	-23.01	3mH	270	1.0	A

\* No other emission were found within 20dB under the limits upto 4.5 GHz.

Total data #06  
V.2d

P(Peak): RBW=VBW=1MHz  
A(Average): Pk Reading -7.5392dB