

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

*for*

**INTENTIONAL RADIATOR**

**434 MHz Pocket Point RF Remote Transmitter**

**Trade Name: VISION**

**MODEL NO: CEZY-PPT**

**FCC ID NO: KFR-LSRT**

**REPORT NO: 01E9408**

**ISSUE DATE: June 22, 2001**

*Prepared for*

**VISION AUTOMOBILE ELECTRONICS INDUSTRIAL CO., LTD.  
NO. 17, ALLEY 92, LANE 189, SEC. 1, AN CHUNG RD.,  
TAINAN, TAIWAN, R. O. C.**

*Prepared by*

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**COMPLIANCE CERTIFICATION SERVICES**



**FCC, VCCI, CISPR, CE  
UL, CSA, TÜV, VDE**

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**1. VERIFICATION OF COMPLIANCE**

COMPANY NAME: VISION AUTOMOBILE ELECTRONICS  
INDUSTRIAL CO., LTD.  
NO. 17, ALLEY 92, LANE 189, SEC. 1, AN CHUNG RD.,  
TAINAN, TAIWAN, R. O. C.

CONTACT PERSON: WANG TSUNG CHIN / ENGINEER

TELEPHONE NO.: 06-255-1269

EUT DESCRIPTION: 434 MHz Pocket Point RF Remote Transmitter

MODEL NAME/NUMBER: CEZY-PPT

FCC ID: KFR-LSRT

DATE TESTED: June 7 ~ June 18, 2001

REPORT NUMBER: 01E9408

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	434 MHz Pocket Point RF Remote Transmitter
MEASUREMENT PROCEDURE	ANSI C63.4 / 1992
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15

The above equipment was tested by Compliance Engineering Services, Inc. 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 Compliance Engineering Services, Inc. will constitute fraud and shall nullify the document.

*Rick Yeo*

RICK YEO / EMC MANAGER  
COMPLIANCE ENGINEERING SERVICES, INC.

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COMPLIANCE ENGINEERING SERVICES, INC. TEL: (02)2217-0894 FAX: (02)2217-1254  
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## 2. Product Description

Fundamental Frequency	<b>434 MHz</b>
Power Source	<b>3V Battery</b>
Transmitting Time	<b>Periodic <math>\leq</math> 5 seconds</b>
Associated Receiver	<b>FCC ID: KFR-LSRR</b>

## 3. Test Facility

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 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

Manufacturer	Model Number	Description	Cal Due Date
R & S	SMY 02	Singal Generator	11/2001
H.P.	8595EM	Spectrum Analyzer (9KHz – 6.5GHz)	01/2002
EMCO	3115	Antenna (1-18GHz)	02/2002
EMCO	3142	Antenna (30-2000MHz)	09/2001
T.E.C.	PA-102	Amplifier	05/2002
MITEQ	NSP2600-44	Amplifier(1-26GHz)	02/2002

**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

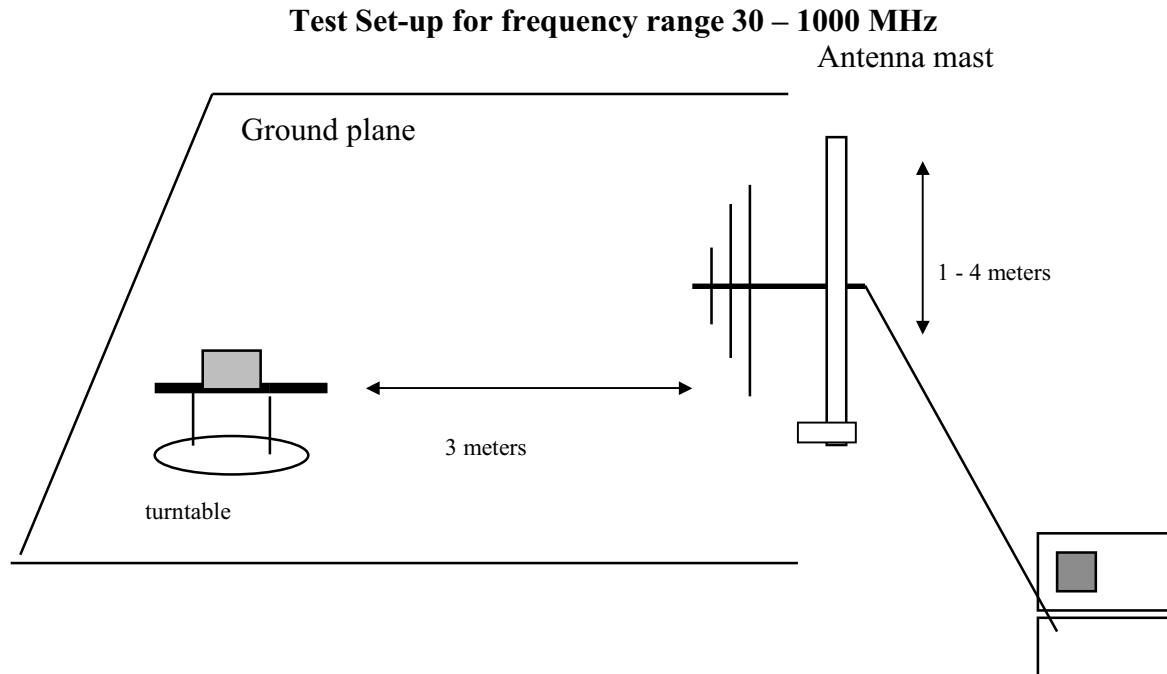
Use a block of foam and combined it with EUT wrapping rubber band around it. This way it can test X,Y, and Z axis. To activate continuous transmission, place a small plastic block between rubber band and EUT push button.



Radiated Open Site Test Set-up

## 10. Test Procedure

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



preamplifier/spectrum analyzer

**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.

### Test set-up for measurements above 1GHz

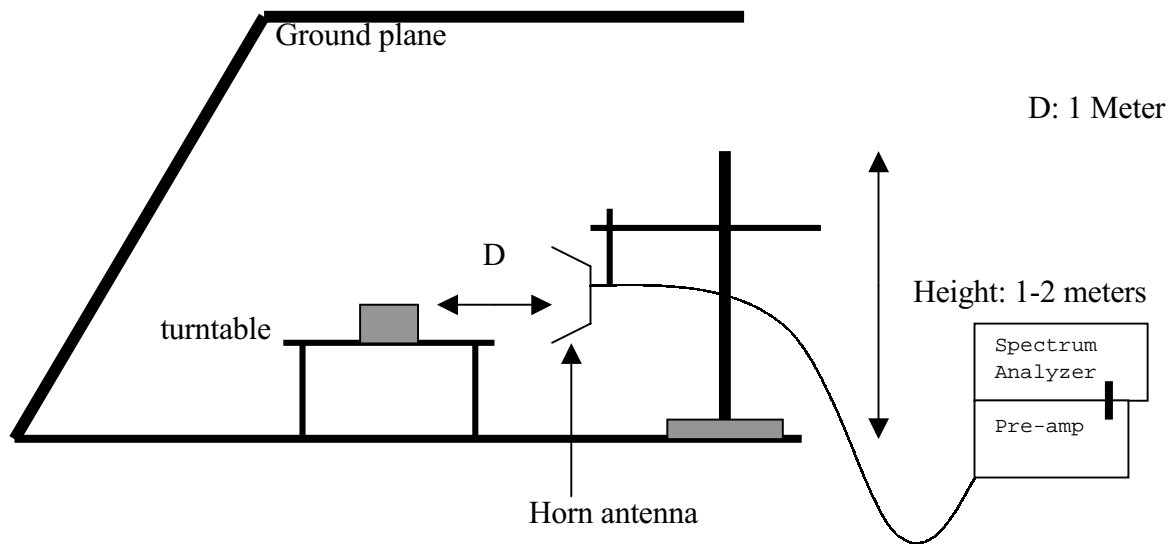


FIG. 2

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:

**Mod.#1 To Change R7 value. (1k Ohm → 47kOhm)**

**Mod.#2 Add a capacitor (22nF) between R7 and Himark TX4915 IC.**



**12. TEST RESULT**

<b>Powerline RFI Class B</b>	<b>Eut</b>	<b>Radiated Emission Limits</b>	<b>Eut</b>
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:

Average Reading = Peak Reading (dBuV/m)+ 20log (Duty Cycle)

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

WHERE      1 Period                      = 108.800 mS > 100mS. Use 100mS for calculation.  
                  Long pulse                      = 0.676 mS  
                  Short pulse                      = 0.284 mS  
                  No of Long pulse                = 31  
                  No of Short pulse                = 47

Duty Cycle = ( N1L1+N2L2+...+Nn-1Ln-1+NnLn)/100 or T

Duty Cycle = ((0.676x31)+(0.284x47))/100=0.343=34.3% or -9.2941dB

**12.2 The Emissions Bandwidth**

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

<b>Center Frequency</b>	<b>Measured</b>	<b>Limits</b>
<b>434 MHz</b>	<b>288.8 kHz &lt; (refer to plot)</b>	<b>434X0.25%=1085 kHz</b>



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

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**Project #:** 01E9408  
**Report #:** 9408D1  
**Date & Time:** 2001/06/08  
**Test Engr:** VINCE CHIANG

**Company:** VISION AUTOMOBILE ELECTRONICS INDUSTRIAL  
**EUT Description:** 434 MHz Pocket Point RF Remote Transmitter  
**Test Configuration :** EUT ONLY  
**Type of Test:** FCC 15.231(b)  
**Mode of Operation:** NORMAL MODE

D-Ste

E-Ste

M% = ((t1+t2+t3+...)/T) \* 100% = **34.3 %**

Av Reading = Pk Reading + 20\*log(M%)  
20\*log(M%) = **-9.2941**

	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	433.90	67.23	57.94	17.50	3.19	21.28	57.35	80.82	-23.48	3mV	90	1.20
	867.81	48.77	39.48	23.37	4.26	20.69	46.42	60.82	-14.40	3mV	90	1.40
Y	433.92	79.75	70.46	17.50	3.19	21.28	69.87	80.82	-10.95	3mV	0	1.10
	867.80	56.87	47.58	23.37	4.26	20.69	54.52	60.82	-6.30	3mV	0	1.30
Z	433.91	76.75	67.46	17.50	3.19	21.28	66.87	80.82	-13.95	3mV	180	1.10
	867.84	51.77	42.48	23.37	4.26	20.69	49.42	60.82	-11.40	3mV	180	1.70
X	433.91	75.48	66.19	17.50	3.19	21.28	65.60	80.82	-15.23	3mH	90	1.10
	867.83	44.94	35.65	23.37	4.26	20.69	42.59	60.82	-18.23	3mH	90	1.50
Y	433.91	68.68	59.39	17.50	3.19	21.28	58.80	80.82	-22.02	3mH	180	1.30
	867.84	45.93	36.64	23.37	4.26	20.69	43.58	60.82	-17.24	3mH	180	1.80
Z	433.91	75.08	65.79	17.50	3.19	21.28	65.20	80.82	-15.62	3mH	0	1.10
	867.81	47.70	38.41	23.37	4.26	20.69	45.35	60.82	-15.47	3mH	0	1.40
	Button #2:											
X	433.93	72.29	63.00	17.50	3.19	21.28	62.41	80.82	-18.41	3mV	180	1.20
	867.84	47.02	37.73	23.37	4.26	20.69	44.67	60.82	-16.15	3mV	180	1.90
Y	433.93	79.98	70.69	17.50	3.19	21.28	70.10	80.82	-10.72	3mV	0	1.30
	867.81	55.32	46.03	23.37	4.26	20.69	52.97	60.82	-7.85	3mV	0	1.50
Z	433.94	74.06	64.77	17.50	3.19	21.28	64.18	80.82	-16.64	3mV	0	1.20
	867.82	50.80	41.51	23.37	4.26	20.69	48.45	60.82	-12.37	3mV	0	1.60
X	433.92	73.10	63.81	17.50	3.19	21.28	63.22	80.82	-17.60	3mH	90	1.10
	867.83	41.76	32.47	23.37	4.26	20.69	39.41	60.82	-21.41	3mH	90	1.50
Y	433.92	76.45	67.16	17.50	3.19	21.28	66.57	80.82	-14.25	3mH	180	1.00
	867.83	43.03	33.74	23.37	4.26	20.69	40.68	60.82	-20.14	3mH	180	1.30
Z	433.93	77.11	67.82	17.50	3.19	21.28	67.23	80.82	-13.59	3mH	0	1.10
	867.83	48.14	38.85	23.37	4.26	20.69	45.79	60.82	-15.03	3mH	0	1.80
	Total data #: 24											



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

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**Project #:** 01E9408  
**Report #:** 9408D2  
**Date & Time:** 2001/06/08  
**Test Engr:** VINCE CHIAN

**Company:** VISION AUTOMOBILE ELECTRONICS INDUSTRIAL  
**EUT Description:** 434 MHz Pocket Point RF Remote Transmitter  
**Test Configuration :** EUT ONLY  
**Type of Test:** FCC 15.231(b)/FCC 15.209  
**Mode of Operation:** NORMAL MODE

D Site

E Site

6 W oist

Des

Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Dist dB	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
1301	74.20	64.91	25.1	2.8	38.00	-9.5	45.36	54.0	-8.64	1mV	0	1.0	A
1736	73.30	64.00	26.7	3.7	33.32	-9.5	51.54	60.8	-9.28	1mV	0	1.0	A
2169	43.80	34.51	28.1	3.9	33.09	-9.5	23.92	60.8	-36.91	1mV	0	1.0	A
2603	52.10	42.81	29.3	4.2	32.87	-9.5	33.87	60.8	-26.93	1mV	0	1.0	A
3037	48.20	38.91	30.9	4.5	36.80	-9.5	28.02	60.8	-32.78	1mV	0	1.0	A
1302	65.70	56.41	25.1	2.8	38.00	-9.5	36.86	54.0	-17.14	1mH	0	1.0	A
1736	65.60	56.31	26.7	3.7	33.32	-9.5	43.85	60.8	-16.95	1mH	0	1.0	A
2169	37.40	28.11	28.1	3.9	33.09	-9.5	17.52	60.8	-43.28	1mH	0	1.0	A
2603	49.80	40.51	29.3	4.2	32.87	-9.5	31.57	60.8	-29.23	1mH	0	1.0	A
3037	45.60	36.31	30.9	4.5	36.80	-9.5	25.42	60.8	-35.38	1mH	0	1.0	A

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

Total data #:10  
V.2d

P(Peak): RBW=VBW=1MHz Distance = 20log(1/3)= -9.5dB  
A(Average): RBW=1MHz, VBW=10Hz(For FCC 15.209)  
A(Average): Pk Reading -9.2941dB(For FCC 15.231(b))

