ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No.	**: E10OR-004**
AGR No	**: A108A-105R**
Applicant	**: UIN Chemical Co., Ltd.**
Address	**: 59-1, Galsan-ri, Tanjung-Myeon, Asan-city, ChoongNam, Korea**
Manufacturer	**: UIN Chemical Co., Ltd.**
Address	**: 59-1, Galsan-ri, Tanjung-Myeon, Asan-city, ChoongNam, Korea**
Type of Equipment	**: Wireless PTAC (Packaged Terminal Air Conditioners) Control System, Sensor**
FCC ID.	**: YR4CS300**
Model Name	**: CS-300**
Serial number	**: None**
Total page of Report	**: 14 pages (including this page)**
Date of Incoming	**: October 01, 2010**
Date of issue	**: October 04, 2010**

SUMMARY

The equipment complies with the regulation; **FCC Part 15 Subpart C Section 15.231.**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by: Young-Min, Choi / Asst. Chief Engineer
EMC/RF Center
ONETECH Corp.

Reviewed by: Y. K. Kwon / Managing Director
EMC/RF Center
ONETECH Corp.

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea
(TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

CONTENTS

PAGE

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

Revision History

Issue Report No.	Issued Date	Revisions	Effect Section
E10OR-004	October 04, 2010	Initial Release	All

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

1. VERIFICATION OF COMPLIANCE

Applicant	: UIN Chemical Co., Ltd.
Address	: 59-1, Galsan-ri, Tanjung-Myeon, Asan-city, ChoongNam, Korea
Contact Person	: Mr. Bum-Yong, Lee / President
Telephone No.	: +82-2-2276-0361
FCC ID	: YR4CS300
Model Name	: CS-300
Brand Name	: SECURITY SYSTEM
Serial Number	: N/A
Date	: October 04, 2010

Equipment Class	**DSC – Low Power Communications Transmitter**
Kind of Equipment	Wireless PTAC (Packaged Terminal Air Conditioners) Control System, Sensor
This Report Concerns	Original Grant
Measurement Procedures	ANSI C63.4: 2009
Type of Equipment Tested	Pre-Production
Kind of Equipment Authorization Requested	Certification
Equipment Will be operated under FCC Rules Part(s)	FCC PART 15 SUBPART C § 15.231
Modification on the Equipment to Achieve Compliance	No
Final Test was conducted on	3 m open area test site

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

2. GENERAL INFORMATION

2.1 Product Description

The UIN Chemical Co., Ltd., Model: CS-300 (referred to as the EUT in this report) is a Wireless PTAC (Packaged Terminal Air Conditioners) Control System, Sensor that is a device designed to save energy in hotels and motels. This device once installed properly will constantly monitor the occupancy of the room as well as the temperature of the room. This device used with the receiver that was manufactured by UIN Chemical Co., Ltd. The receiver shall be subject to certification procedure (FCC ID: YR4PC300) and issued by another test report. Product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
RF FREQUENCY	311.06 MHz
MODULATION	ASK
LIST OF EACH OSC. OR CRY. FREQ.(FREQ. >= 1 MHz)	None
ANTENNA TYPE	PCB Pattern Antenna
RATED SUPPLY VOLTAGE	DC 3 V from a battery
NUMBER OF LAYERS	2 Layers

2.2 Model Differences

-. None

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 15.231.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4: 2009 at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. Description details of test facilities were submitted to the Commission on August 21, 2008. (Registration Number: 340658)

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	PTS-100A V1.0	N/A

3.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested: None

3.3 Mode of operation during the test

During the test, the EUT was continuously transmitted by changing firmware in the EUT. To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, YZ, and ZX axis and the worst case is "XY" axis.

3.4. EUT MODIFICATIONS

-. None

3.5 Configuration of Test System

Line Conducted Test: It is not need to test this requirement, because the EUT shall be operated by DC battery.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2009 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.
The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

Occupied Bandwidth Measurement:
This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer. The plot is taken at 20 kHz/division frequency span, 10 kHz resolution bandwidth and 5 dB/division logarithmic display from the spectrum analyzer.

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

3.6 Antenna Requirement

According to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT is a PCB pattern antenna on the main board in the EUT, so no consideration of replacement by the user.

3.7 Non-Periodic Transmission Requirement

According to section 15.231(a)(3), periodic transmissions at regular predetermined intervals are not permitted.

Conclusion: The EUT only transmits when the sensor in the EUT sensing some object and changing temperature, so the EUT meets this requirement.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
It is not need to test this requirement, because the power of the EUT is supplied from a DC battery.	

4.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
TX Mode	X

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

5.1 Field Strength of the Carrier Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 42 % R.H. Temperature: 19 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231(b)

Type of Test : INTENTIONAL RADIATOR

Result : PASSED BY –3.56 dB under peak mode

EUT : Wireless PTAC (Packaged Terminal Air Conditioners)
Control System, Sensor Date: October 04, 2010

Operating Condition : TX mode

Distance : 3 m

Radiated Emission			Ant		Turn	Correction Factors		Total	Limit	Margin
Freq. (MHz)	Amplitude (dBµV)	Detect Mode	Pol.	Height (m)	Table (°)	Ant. (dBµV/m)	Cable (dB)	Amplitude (dBµV/m)	(dBµV/m)	(dB)
311.06	53.90	Peak	H	1.30	280.00	14.40	3.52	71.82	75.38	-3.56
	45.90	Peak	V	1.60	350.00	14.40	3.52	63.82	75.38	-11.56
	47.20	Average	H	1.30	280.00	14.40	3.52	65.12	75.38	-10.26
	38.90	Average	V	1.60	350.00	14.40	3.52	56.82	75.38	-18.56

* Remark: “H”: Horizontal Polarization, “V”: Vertical Polarization

Tested by: Young-Cheol, Park / Engineer

5.2 Transmitter Transmission Duration

Humidity Level : 42 % R.H. Temperature: 19 °C

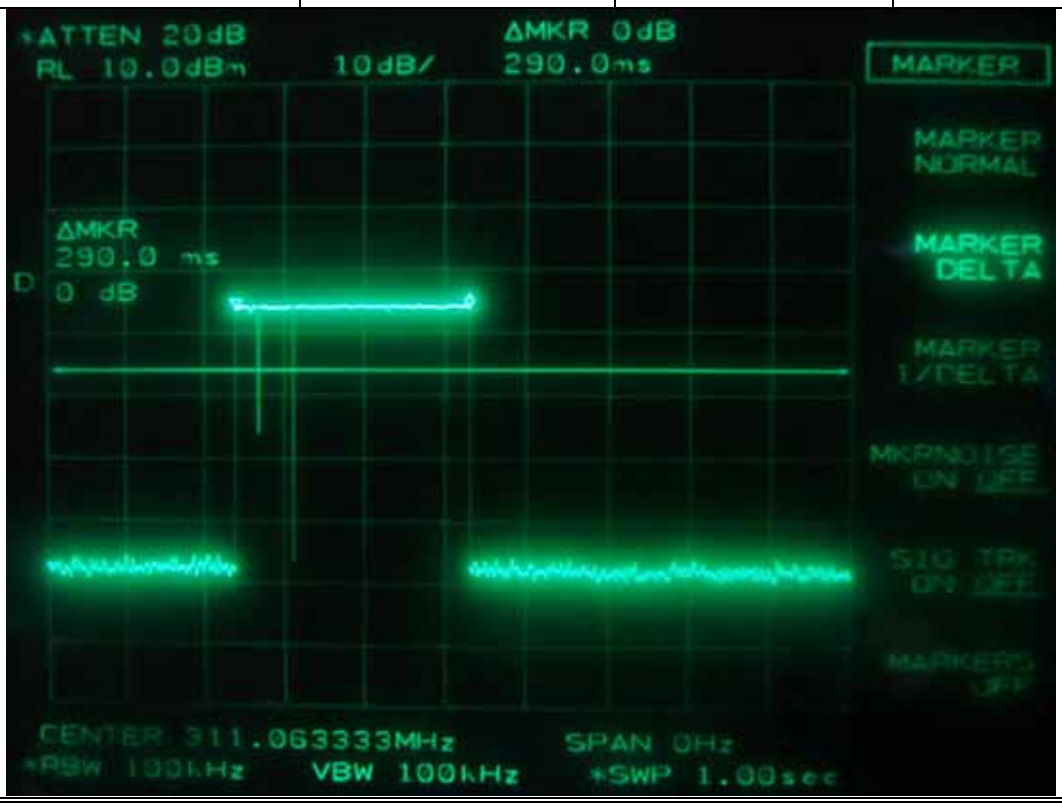
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231 (a)(2)

Type of Test : INTENTIONAL RADIATOR

EUT : Wireless PTAC (Packaged Terminal Air Conditioners) Control System, Sensor Date: October 04, 2010

Operating Condition : TX mode

Manually Activated Duration (s)	Limit (s)	Margin (s)	Result
0.290	5.0	-4.710	Pass



Tested by: Young-Cheol, Park / Engineer

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)

EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

5.3 Spurious Emission Test

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : 42 % R.H. Temperature: 19 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231(b)

Type of Test : INTENTIONAL RADIATOR

Result : PASSED BY -11.62 dB at 622.12 MHz

EUT : Wireless PTAC (Packaged Terminal Air Conditioners) Control System, Sensor Date: October 04, 2010

Distance : 3 m

Radiated Emission			Ant		Turn	Correction Factors		Total	Limit	Margin
Freq. (MHz)	Amplitude (dBμV)	Detect Mode	Pol.	Height (m)	Table (°)	Ant. (dBμV/m)	Cable (dB)	Amplitude (dBμV/m)	(dBμV/m)	(dB)
622.12	18.20	Peak	H	1.50	230.00	20.42	5.14	43.76	55.38	-11.62
	11.40	Peak	V	1.20	130.00	20.42	5.14	36.96	55.38	-18.42
	11.60	Average	H	1.50	230.00	20.42	5.14	37.16	55.38	-18.22
	4.70	Average	V	1.20	130.00	20.42	5.14	30.26	55.38	-25.12
Other spurious frequencies were not found up to 3 100 MHz.										

*Remark: “H”: Horizontal Polarization, “V”: Vertical Polarization

Tested by: Young-Cheol, Park / Engineer

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

5.4 Bandwidth of the operating frequency

Humidity Level : 42 % R.H. Temperature: 19 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231(c)

Type of Test : INTENTIONAL RADIATOR

Result : PASSED

EUT : Wireless PTAC (Packaged Terminal Air Conditioners) Control System, Sensor Date: October 04, 2010

Operating Condition : TX mode

Minimum Resolution Bandwidth : 30 kHz

Carrier Freq. (MHz)	Bandwidth of the emission. (kHz)	Limit (kHz)	Remark
311.06	139.2	777.65	The point 20 dB down from the modulated carrier

Remark: Please refer to Photo Data for bandwidth for test data.

Tested by: Young-Cheol, Park / Engineer

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

Photo Data for bandwidth

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)

EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+	Meter reading	(dBμV)
+	Cable Loss	(dB)
+	Antenna Factor (Loss)	(dB/m)
=	Corrected Reading	(dBμV/m)
-	Specification Limit	(dBμV/m)
=	dB Relative to Spec	(± dB)

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)

7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	EMI Test receiver	R/S	ESCI	101012	MAY/10	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/10	12MONTH	
3.	Spectrum analyzer	HP	8566B	2421A00473	NOV/09	12MONTH	■
4.	Loop Antenna	R/S	HFH 2-Z2	889 285 / 26	OCT/08	24MONTH	
5.	Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D295	JUN/09	24MONTH	■
6.	Biconical antenna	EMCO	3110	9003-1121	FEB/10	24MONTH	
		Schwarzbeck	VHA9103	91031852	MAR/10		■
7.	Log Periodic antenna	Schwarzbeck	9108-A(494)	62281001	MAR/10	24MONTH	■
8.	LISN	EMCO	3825/2	9109-1867	JUN/10	12MONTH	
				9109-1869	JUN/10		
		Schwarzbeck	NSLK 8128	8128-216	JUN/10		
9.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
10.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
11.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■
12.	RF Amplifier	HP	8447D	2727A04987	JUN/10	12MONTH	■
13.	Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D294	JUL/09	24MONTH	■
14.	Spectrum Analyzer	HP	8564E	3650A00756	JUN/10	12MONTH	■
15.	Isolation Transformer	Digitek Power	DPT	DPF-22027	N/A	N/A	■
16.	Isolation Transformer	Digitek Power	DPT	DPF-22028	N/A	N/A	■
17.	Frequency Converter	Digitek Power	VFS/DEFC	N/A	N/A	N/A	■

HEAD OFFICE : #505 SK Apt. Factory, 223-28 Sangdaewon1-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do 462-121 Korea (TEL: 82-31-746-8500 FAX: 82-31-746-8700)
EMC Testing Dept : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea.(TEL: 82-31-765-8289 FAX: 82-31-766-2904)