



ONETECH Corp.

#505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-121, Korea. (TEL: 82-342-746-8500 FAX: 82-342-746-8700)

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

REMOTE TRANSMITTER
CERTIFICATION TO FCC PART 15 REQUIREMENT

PRODUCT	REMOTE & PROGRAMABLE VEHICLE STARTING SYSTEM		
FCC ID	OUGRS905R		
MODEL NO.	RS-905R	SERIAL NO.	N/A
APPLICANT & ADDRESS	PROMISE ENGINEERING INC. 1102 N. VASSAULT STREET TACOMA, WA 98406		

REPORT NO.	E99DR-029	ISSUE DATE	December 23, 1999
PREPARED BY: ONETECH CORP. #505 SK APT. FACTORY 223-28, SANGDAEWON 1 DONG, JUNGWON-GU, SEONGNAM-CITY, KYUNGGI-DO, 462-121, KOREA. (TEL: 82-342-746-8500 FAX: 82-342-746-8700)			

LIST OF EXHIBITS

FCC ID : OUGRS905R
MODEL : RS-905R

EXHIBIT 1. IDENTIFICATION LABEL

2. AGENT AUTHORIZATION

3. TECHNICAL INFORMATION:

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

4. PHOTO REPORT

5. USER'S MANUAL & SCHEMATIC (BLOCK DIAGRAM)

PREPARED BY : ONETECH CORP.

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EXHIBIT 1. IDENTIFICATION LABEL:**PROPOSED FCC LABEL (Part15 sec. 15.19)**

The label included following statement will be attached on bottom side of product.

FCC ID : OUGRS905R

This device complies with Part 15 of the FCC Rules. Operation 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 operations.

Made in korea

“Please find an ID Label for EUT at ID Label/Location Info in Exhibit Type”

EXHIBIT 2. AGENT AUTHORIZATION:

“Please find an Agent Authorization Letter at Cover Letters in Exhibit Type”

EXHIBIT 3. TECHNICAL INFORMATION:**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT****REMOTE TRANSMITTER
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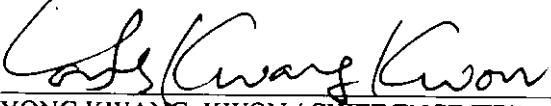
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1. VERIFICATION OF COMPLIANCE

APPLICANT : PROMISE ENGINEERING , INCORPORATION.
ADDRESS : 1102 N. VASSAULT STREET TACOMA WA 98046
CONTACT PERSON : BOIN CHOI / PRESIDENT
TELEPHONE NO : 253-752-7704
FCC ID : OUGRS905R MODEL NO/NAME: RS-905R
SERIAL NUMBER : N/A
DATE : December 23, 1999

DEVICE TYPE	INTENTIONAL RADIATOR
E.U.T. DESCRIPTION	REMOTE & PROGRAMABLE VEHICLE STARTING SYSTEM
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	PART 15 SUBPART C §15.231
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	NO
FINAL TESTS WERE CONDUCTED ON	3 METER OPEN 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.


YONG KWANG, KWON / CHIEF ENGINEER
EMC TESTING DEPARTMENT
ONETECH Testing & Eval. Lab.
SEOUL KOREA

2. GENERAL INFORMATION

2.1 Product Description

The PROMISE ENGINEERING, INCORPORATION., Model RS-905R (referred to as the EUT in this report) is a transmitter that controls the engine start/stop and the door lock/unlock function of the main module, which will be installed in a vehicle. The product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
TX FREQUENCY RANGE	447.725 MHz
MODULATION	FM
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	89.545 MHz
ANTENNA TYPE	Built-in on the PCB in the EUT
POWER REQUIREMENTS	DC 12V, 10mA (Lithium cell)
NUMBER OF LAYERS	2 LAYERS
FUNCTION OF BUTTON	Engine Start/Stop and Doors Lock/Unlock

* Remark: This equipment has a switch that is automatically deactivates the transmitter within not more than 1 second of being released.

2.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

2.3 Test System Details

The EUT was tested with the following all equipment used in the tested system are: None

2.4 Test Methodology

Both Radiated emission testing and Bandwidth of operating frequency were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 3 meters.

2.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Detailed description of test facility was submitted to the Commission on January 12, 1999. (Registration Number: 92819)

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components inside the EUT were installed.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	SUNG WON ELECTRONICS CORP.	RS-905R	N/A
TX MODULE	LG Precision Co., Ltd.	RF447FT	N/A

3.2 Equipment Modifications

To achieve compliance to FCC part 15 rule, the following change(s) were made by Sung Won Electronics's Engineer during compliance testing:

“There was no Modified items during EMI test”

3.3 Mode of operation during the test

To get a maximum radiated emission from the EUT, the button on the EUT was continuously pressed to transmit the RF signal

3.4 Configuration of Test System

Line Conducted Emission Test:

It is not need to test this requirement, because the power of the EUT supplies from a DC battery.

Field Strength of the Carrier Test:

The field strength of the carrier frequency shall be tested at open field test site with normal supply voltage. In addition, the variation of the fundamental transmitted by the device is shown for variation in supply voltage to 80% and 115% of the normal supply voltage. **For battery operated equipment, tests shall be performed using a new battery.**

Spurious Emission Test:

Preliminary radiated emissions tests were conducted using the procedure in ANSI C63.4/1992, 8.3.1.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meters open area test site.

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 50kHz/division frequency span, 10kHz-resolution bandwidth and 5dB/division logarithmic display from an 8568B spectrum analyzer. Bandwidth is determined at the point 20dB down from the modulated carrier.

4. PRELIMINARY TESTS

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)
N/A	N/A

4.2 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

To get a maximum emission level using average detector mode, the switch on the EUT was pressed in order to transmit a RF signal continuously. In that case, one complete pulse train including blanking interval not exceed 0.1 seconds was continuously transmitted from the EUT and then we measured field strength level from the EUT in average mode using EMI Receiver, Model No.: ESVS10, manufactured by Rohde & Schwarz, in which the IF bandwidth of the receiver was 10kHz.

5. RADIATED MEASUREMENT PHOTOS

<Radiated Measurement Photos>



6. FINAL RESULT OF MEASUREMENT

Per preliminary tests, the following TX mode of operations were selected which shown the maximum emissions level.

6.1 Conducted Emissions Tests

Humidity Level : % Temperature :

Limits apply to : FCC CFR 47, PART 15, SUBPART C

Result : PASSED BY dB

Operating Condition : Date:

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Power Line Conducted Emissions			FCC Limit	
Frequency (MHz)	Amplitude (dBuV)	conductor	Limit (dBuV)	Margin (dB)
It is not need to test this requirement, because the power of the EUT is supplied from a DC battery.				

Line Conducted Emissions Tabulated Data

6.2 Field Strength of the Carrier Test

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

Humidity Level : 41 % Temperature : 12
 Limits apply to : FCC CFR 47, PART 15, SUBPART C
 Result : PASSED BY -3.1 dB at Peak Mode
 Operating Condition : TX mode
 Distance : 3 Meter

Date: December 10, 1999

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Carrier Freq. (MHz)	Ampl. (dBuV)	Detect Mode	Ant.	Ant. (dBuV/m)	Cable (dB)	Ampl (dBuV/m)	Limit (dBuV/m)	Margin (dB)
447.7	55.3	Peak	H	16.74	6.17	78.21	81.27	-3.06
	50.4	Average	H	16.74	6.17	73.31	81.27	-7.96

*Remark: FCC Limit: 3,750 ~ 12,500uV/m to 260 ~ 470MHz (linear interpolations)

Limit calculation at 307.9 MHz = $(12,500 - 3,750)/(470 - 260) \times (447.725 - 260) + 3,750 = 11,571.875 \text{ uV/m}$

$$20\log 11,571.875 = 81.27 \text{ dBuV/m}$$


Measuring by: Gea Won, Lee / Project Engineer

6.3 Spurious Emission Test

Humidity Level : 41 % Temperature : 12
 Limits apply to : FCC CFR 47, PART 15, SUBPART C
 Result : PASSED BY -20.1 dB at 895.44 MHz using Peak Mode Detector
 Operating Condition : TX mode Date: December 10, 1999
 Distance : 3 Meter

Radiated Emissions			Ant	Correction Factors		Total(dBuV/m)		FCC Limit(dBuV/m)		
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV)	Cable (dB)	Average	Peak	Limit	Margin(dB)	
									Average	Peak
268.6	11.6	Peak	H	13.68	4.82		30.10	61.3		-31.20
358.6	19.4	Peak	H	15.63	5.43		40.46	61.3		-20.84
626.8	7.5	Peak	H	19.16	6.81		33.47	61.3		-27.83
805.9	8.4	Peak	H	21.02	7.65		37.07	61.3		-24.23
895.44	11	Peak	H	22.51	7.68		41.19	61.3		-20.11
	5.5	Average	H	22.51	7.68	35.69		61.3	-25.61	

Other spurious frequencies were not found up to 3000 MHz.

*Remark: FCC Limit: 375 ~ 1,250uV/m (linear interpolations) for using fundamental frequency between 260 ~ 470MHz


 Measuring by: Gea Won, Lee / Project Engineer

6.4 Bandwidth of the operating frequency

Humidity Level : 41 % Temperature : 12
Limits apply to : FCC CFR 47, PART 15, SUBPART C
Result : PASSED
Operating Condition : TX mode
Minimum Resolution Bandwidth : 10 kHz

Date: December 10, 1999

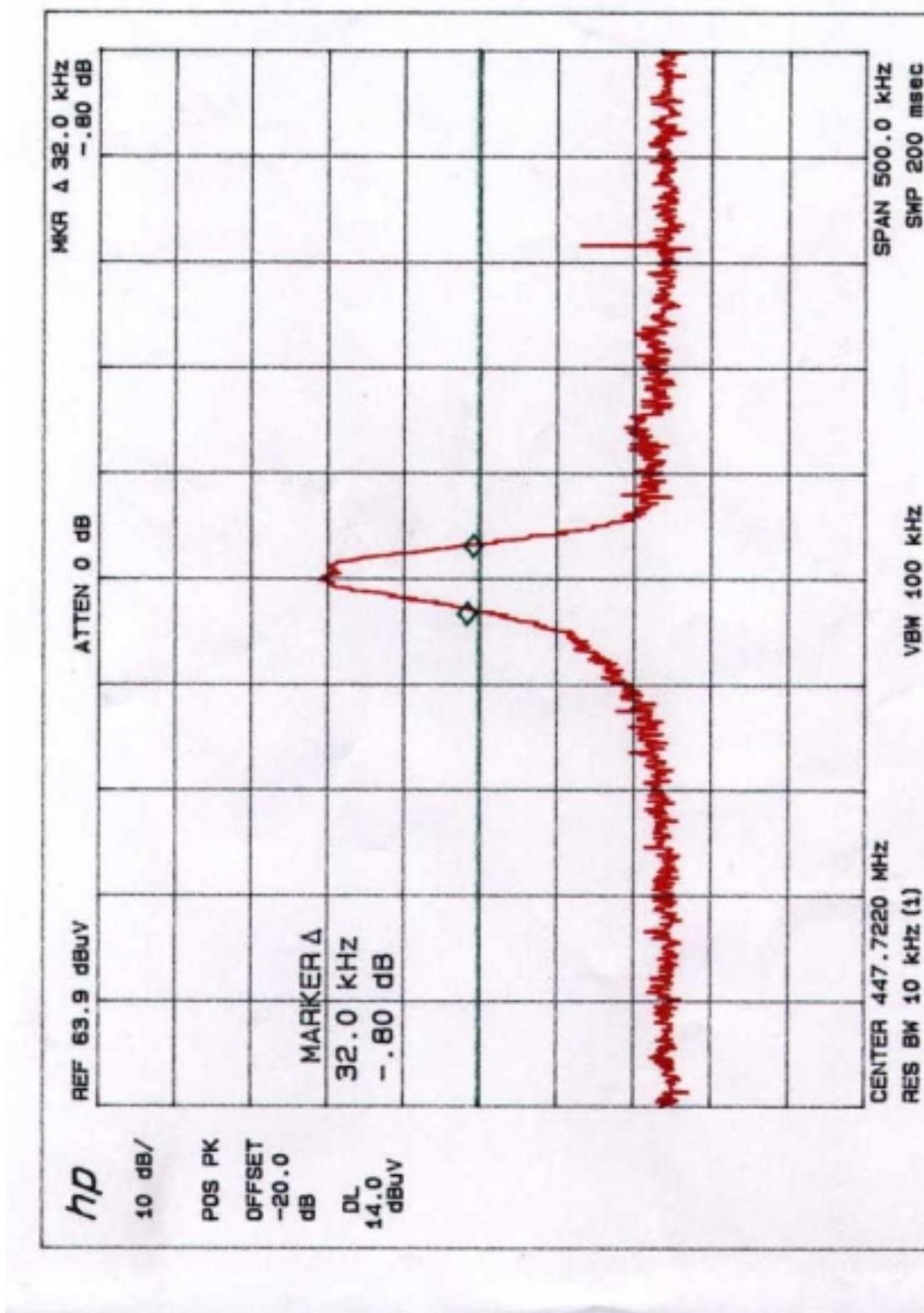
Carrier Freq. (MHz)	Bandwidth of the emission. (kHz)	Limit (kHz)	Remark
447.72	32	1119	<u>The point 20dB down from</u> <u>the modulated carrier</u>

Remark: FCC Limit for above testing is 447.725 MHz X 0.0025 = 1119 kHz.

Enclosed please find a test data in a next page.



Measuring by: Gea Won, Lee / Project Engineer



7. FIELD STRENGTH CALCULATION

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

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

8. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	SEP/99	12MONTH	■
2.	Spectrum analyzer	HP	8568B	3026A0226	SEP/99	12MONTH	■
3.	RF preselector	HP	85685A	3107A01264	SEP/99	12MONTH	■
4.	Quasi-Peak Adapter	HP	85650A	3107A01542	SEP/99	12MONTH	■
5	Signal Generator	Philips	PM5518-TX	N/A	APR./99	12MONTH	
6.	Pattern generator	N/A	LCG-401	SG-0010126	N/A	N/A	
7.	Dipole Antenna	EMCO	3121C	9107-745	FEB/99	12MONTH	
8.	Biconical Antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	MAR/99	12MONTH	■
9.	Log Periodic Antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	MAR/99	12MONTH	■
10.	Conical Log Spiral Antenna	EATON	93491-2	340	FEB/99	12MONTH	■
11.	LISN	EMCO	3825/2	9109-1867 9109-1869	MAR/99	12MONTH	■
12.	RF Amplifier	HP	8447F	3113A04554	AUG/99	N/A	
13.	Spectrum Analyzer	ADVANTEST	R4131BN	91520070	FEB/99	12MONTH	■
14.	Computer System Hard disk drive	HP	98581C 9153C	98543A CMC762Z9153	N/A N/A	N/A N/A	■ ■
15.	Plotter	HP	7475A	30052 22986	N/A	N/A	■
16.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
17.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
18.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■

EXHIBIT 4. PHOTO REPORT

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“Please find in/outside photos of EUT at External Photos in Exhibit Type”

EXHIBIT 5. USER'S MANUAL & SCHEMATIC (BLOCK DIAGRAM)

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“Please find a manual and block diagram for EUT at User Manual in Exhibit Type”