

TEST REPORT

Ref. Report No.
99-341-062-2

This test report only responds to the tested sample and shall not be reproduced except

Name and address of the applicant

Dong Yang Security Electronics Co., Ltd.
Block 45, Lot 6, Namdong Industrial Complex 435-6,
Nonhyung-Dong, Namdong-Ku, Inchon,
Korea 435-300

Standard / Test regulation

FCC Part 15, Subpart B

Test result

Pass

Incoming date : December 28, 1999

Test date : January 11~17, 2000

Test item(s) ;

Superregenerative Receiver(Car Alarm)

Model/type ref. ;

THORN99

Manufacturer ;

Dong Yang Security Electronics Co., Ltd.

Additional information ;

-Required Authorization :Certification
FCC ID. : HH8-THORN99-RX

Issue date : January 20, 2000

in full without written approval of the Korea Testing Laboratory .

Tested and reported by



Soun-Kweon Seol , Senior Engineer

Reviewed by



Seok-Jin Kim , EMC Team Leader

KOREA TESTING LABORATORY

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. GENERAL INFORMATION

1. Grantee Name and : Dong Yang Security Electronics Co., Ltd.
Mailing Address Block 45, Lot 6, Namdong Industrial Complex 435-6, Nonhyung-Dong ,
Namdong-Ku, Inchon, Korea 435-300

2. Manufacturer's Name and : Dong Yang Security Electronics Co., Ltd.
Mailing Address Block 45, Lot 6, Namdong Industrial Complex 435-6, Nonhyung-Dong ,
Namdong-Ku, Inchon, Korea 435-300

3. Equipment Descriptions

3.1 Tuning Frequency : 304.0 MHz
3.2 Detect Method : Superregenerative Detector
3.3 Used Oscillator : 304 MHz(L-C oscillator)
3.4 Power Supply : DC 12.0V (Car Battery)

4. Rules and Regulations : FCC Part 15, Subpart B

5. Measuring Procedure : ANSI C63.4-1992

6. Place of Measurement : Absorber-lined room(3-Meter) of KTL

7. Date of Measurement

7.1 Line Conducted : Not Applicable
7.2 Radiated Emission : January 15, 2000

. GENERAL REQUIREMENTS OF THE EUT

1. Labelling Requirement (Section 15.19)

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 operation.

1.1 Location on Enclosure : Manual for Installation and Operating Instruction1.2 How Applied : Printing

2. Information to User (Section 15.21)

The following or similar statements were provided in the manual for user instruction.

Please refer page 11 of the attached manual for details.

CAUTION : Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3. Special Accessories (Section 15.27)

3.1 Were the special Accessories provided? [] yes, [x] no

3.2 If yes, details for the special accessories are as follows :

3.3 If yes, were the appropriate instructions provided on the first page of the text concerned with the device? [] yes, [] no

3.4 Are these accessories provided of the type which can be readily obtained from multiple retail outlets? [] yes, [] no

And therefore does the manual specify what additional components or accessories are required to be used in order to comply with the Rules?

[] yes, [] no

. RADIATED EMISSION MEASUREMENT (Section 15.109)**1. Test Procedure****1.1 Preliminary Testing for Reference**

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna(Biconical antenna : 30 to 300MHz, Log-periodic antenna : 200 to 1000MHz or Horn Antenna : 1 to 18GHz) was placed at the distance of 1 meter from the EUT.

In order to cohere the individual components of the characteristic broadband emission from the receiver(EUT), a RF generator(CW signal) and a log-periodic antenna were used. The frequency and output level of the generator were adjusted for highest observed coherent receiver emissions on the spectrum analyzer with RF Amplifier.

An attempt was made to maximize the emission level with the various configurations of the test sample. The effect of changing the position of the cable was observed to find the worst case configuration while rotating the table and varying antenna height and its polarization.

Radiated and spurious emissions were checked from 25 MHz to 4500 MHz according to section 15.33.

1.2 Final Radiated Emission Test at a Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by ANSI C63.4.

Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver or spectrum analyzer with RF amplifier.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum level.

Maximum emission occurred at the configuration as shown in the following photograph.

2. Photograph for the worst case configuration



3. Sample Calculation

The emission level measured in decibels above one microvolt (dB μ) was converted into microvolt per meter ($\mu\text{V}/\text{m}$) as shown in following sample calculation.

For example :

Measured Value at <u>304.04MHz</u>	50.3	dB
+ Antenna Factor	14.4dB	
+ Cable Loss	3.2 dB	
- Preamplifier	30.0dB	

= Radiated Emission 37.9 dB $\mu\text{V}/\text{m}$
(= 78.5 $\mu\text{V}/\text{m}$)

4. Measurement Data

- Resolution Bandwidth : Peak (3dB Bandwidth : 100kHz for 1GHz below)

Peak (3dB Bandwidth : 1MHz for 1GHz over)

- Measurement Distance : 3 Meter

Frequency (MHz)	* D.M.	* A.P.	Measured Value (dB)	* A.F. + C.L (dB)	* A.G. (dB)	* D.C.F. (dB)	Emission Level		Limit (/m)	** Margin (dB)
							(dB /m)	(/m)		
304.04	P	H	50.3	17.6	-30.0	-	37.9	78.5	200	-8.1
608.08	P	H	39.3	23.4	-30.0	-	32.7	43.2	200	-13.3
912.12	P	H/V	*** <32.0	28.3	-30.0	-	<30.3	<32.7	200	<-13.3
1216.16	P	H/V	*** <40.0	31.2	-35.0	-	<36.9	<70.0	500	<-17.1
1520.20	P	H/V	*** <40.0	33.5	-35.0	-	<38.5	<84.1	500	<-15.5
1824.96	P	H/V	*** <40.0	35.8	-35.0	-	<40.8	<109.6	500	<-13.2
-	-	-	-	-	-	-	-	-	-	-

Note

* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)

A.P. : Antenna Polarization (H : Horizontal, V : Vertical)

A.F. : Antenna Factor

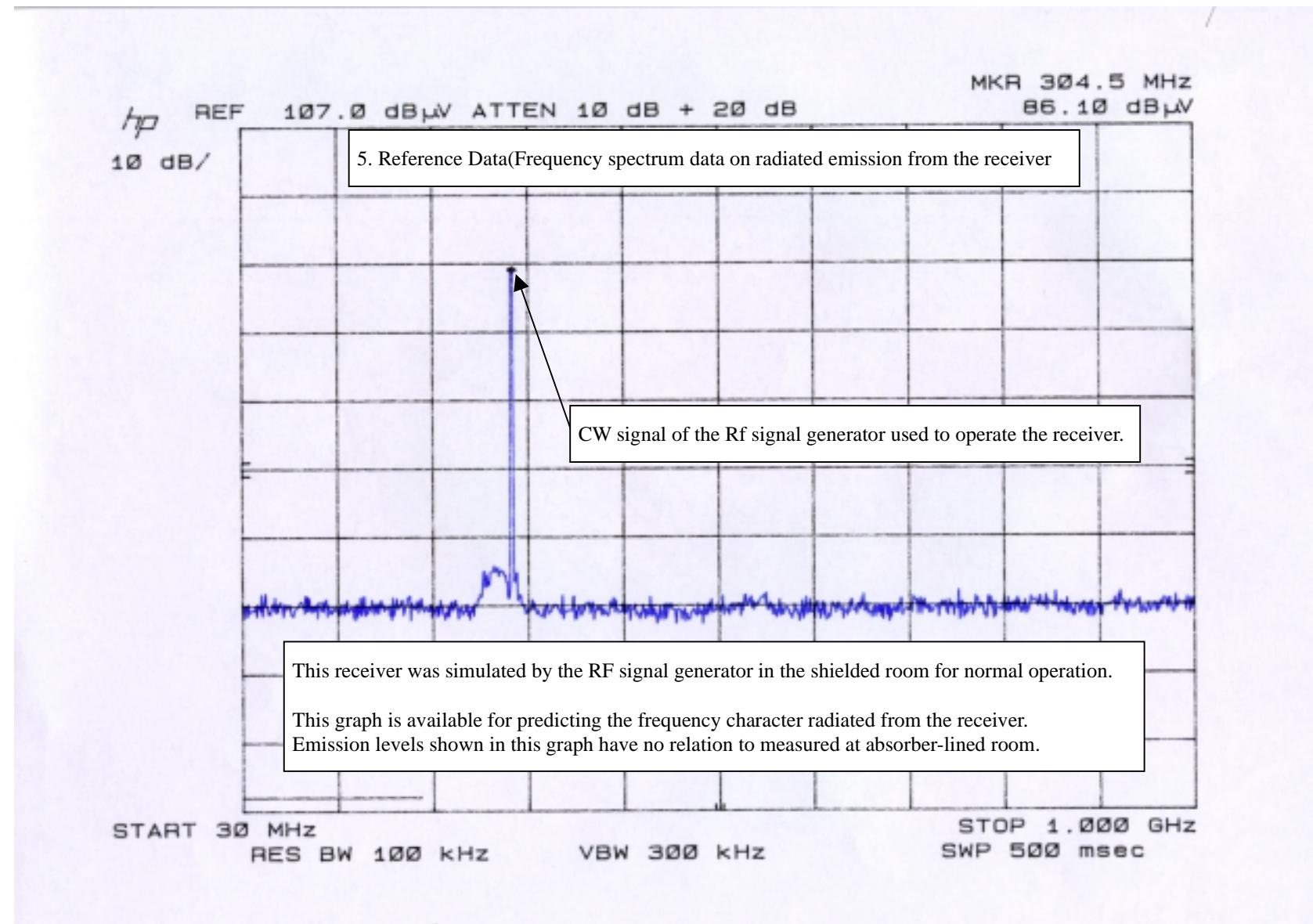
C.L. : Cable Loss

A.G. : Amplifier Gain

D.C.F. : Distance Correction Factor

** Margin (dB) = Emission Level (dB) - Limit (dB)

*** < means less than. The observed spectrum analyzer noise floor levels with RF preamplifier were 32.0 dB and 40.0 dBuV. And Refer to frequency spectrum data on radiated emission from the receiver in next page.



TEST EQUIPMENT USED FOR MEASUREMENTS

<u>Equipment</u>	<u>Model No.</u>	<u>Manufacturer</u>	<u>Serial No.</u>	<u>Effective Cal. Duration</u>
[x] EMI Receiver (20MHz-1GHz)	ESVS30	R & S	830516/002	06/29/99-06/29/00
[x] Spectrum Analyzer (9kHz-26.5GHz)	8563A	H. P.	3222A02069	02/10/99-02/10/00
[x] Spectrum Analyzer (100Hz-22GHz)	8566B	H. P.	3014A07057	05/29/99-05/29/00
[x] Quasi-Peak Adapter (10kHz-1GHz)	85650A	H. P.	3107A01511	05/29/99-05/29/00
[x] RF-Preselector (20Hz-2GHz)	85685A	H. P.	3010A01181	05/29/99-05/29/00
[] Test Receiver (9kHz-30MHz)	ESH3	R & S	860905/001	06/29/99-06/29/00
[x] Pre-Amplifier (0.1-3000MHz, 30dB)	8347A	H. P.	2834A00543	05/29/99-05/29/00
[x] Pre-Amplifier (1-26.5GHz, 35dB)	8449B	H. P.	3008A00302	06/29/99-06/29/00
[] LISN(50 , 50 H) (10kHz-100MHz)	3825/2	EMCO	9010-1710	-
[] LISN(50 , 50 H) (10kHz-100MHz)	3825/2	EMCO	9011-1720	-
[x] Plotter	7470A	H. P.	3104A21292	-
[x] Tuned Dipole Ant. (30MHz-300MHz)	VHA 9103	Schwarzbeck	-	*
[x] Tuned Dipole Ant. (300MHz-1GHz)	UHA 9105	Schwarzbeck	-	*
[x] Biconical Ant. (20MHz-200MHz)	BBA9106	Schwarzbeck	-	*
[x] Log Periodic Ant. (200MHz-1GHz)	3146	EMCO	-	*
[x] Horn Ant. (1GHz-18GHz)	3115	EMCO	-	*
[x] RF Signal Generator (10MHz-20GHz)	83620A	H. P.	3250A01653	06/29/99-06/29/00
[x] DC Power Supply	6260B	H. P.	1145A04822	-
[x] Shielded Room (5.0m x 4.5m)	SIN-MYUNG		-	-

* Each set of antennas has been calibrated to ensure correlation with ANSI C63.5 standard.

The calibration of antennas is traceable to Korea Standard Research Institute(KSRI).