



Certificate of Compliance

Test Report No.	KEL06-F02057		
Applicant	Easyintech Co., Ltd.		
Applicant Address	Samsungfire B/D 16F, 2-1 Beomeo-dong, Suseong-gu, Daegu, 706-010, South Korea		
Manufacturer	Easyintech Co., Ltd.		
Manufacturer Address	Samsungfire B/D 16F, 2-1 Beomeo-dong, Suseong-gu, Daegu, 706-010, South Korea		
Product Type	Remote controller for fingerprint Identification Doorlock		
FCC ID	T3EERX-7100HR	Model No.	ERX-7100HR
Incoming Date	Feb 28, 2006	Date of Issue	Mar 16, 2006
Location of Testing	KOREA EMC LABORATORY 390 Bora-dong, Giheung-gu, Yongin-si, Gyeonggi-do, South Korea 446-904		
Test Procedure	ANSI C63.4 / 2003		
Test Specification	FCC Title 47, Part 15 Subpart C		
Equipment Class	DSR – Part 15 Remote Control / Security Device Transceiver		
Test Result	The above-mentioned device has been tested and passed.		
Additional Information	Test report(Verification) of Receiver portion of this unit is issued on Report No.KEL06-F02056		
Tested & Reported by	Chang-Min, Moon	Approved by	Su-Gil, Moon
	2006. 03. 16		2006. 03. 16
Signature	Date	Signature	Date
Other Aspects:			
Abbreviations:	· OK, Pass = passed · Fail = failed · N/A = not applicable		

- ☞ •This test report is not permitted to copy partly without our permission.
- This test result is dependent on only equipment to be used.
- This test result is based on a single evaluation of one sample of the above mentioned.
- We certify that this test report has been based on the measurement standards that is traceable to the national or International standards.

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Appendix

- External Photos of EUT
- Internal Photos of EUT
- Test Set-up Photos



1. GENERAL

These tests were performed using the test procedure outlined in ANSI C63.4, 2003 for intentional radiators, and in accordance with the limits set forth in FCC Part 15.231 for Remote Control / Security Device Transceiver. The EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards.

We attest to the accuracy of data. All measurements reported herein were performed by KOREA EMC LABORATORY and were made under Chief Engineer's supervision.

We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. TEST SITE

KOREA EMC LABORATORY

2.1 Location

390 Bora-dong, Giheung-gu, Yongin-si, Gyeonggi-do, South Korea 446-904

This test site is in compliance with ISO/IEC 17025 for general requirements for the competence of testing and calibration laboratories.



2.2 List of Test and Measurement Instruments

Description	Manufacturer	Model #	Serial #	
Spectrum Analyzer	Advantest	R3273	110600584	<input checked="" type="checkbox"/>
Spectrum Analyzer	H.P	8560E	3517A01551	<input checked="" type="checkbox"/>
Modulation Analyzer	H.P	8901B	3438A05241	
Audio Analyzer	H.P	8903B	3011A08331	
Frequency Counter	EIP Microwave	28B	9205-004723	
CDMA Mobile StationTest Set	H.P	8924C	US37261566	
Digital Oscilloscope	Tecktronics	TDS380	B011855	
Digital Multimeter	Fluke	8842A	6585251	
Test Receiver	Rohde&Schwarz	ESVS10	825120/006	
Test Receiver	Rohde&Schwarz	ESCS30	100054	<input checked="" type="checkbox"/>
Signal Generator	H.P	E4421A	US37230495	
Function Generator	H.P	33120A	US36030957	
Dual Directional Coupler	H.P	778D	14903	
L.I.S.N(for E.U.T)	SCHWARZBECK	NSLK8128	8128144	
L.I.S.N(for Peripheral)	Kyoritsu	KNW-407	8-8833-14	
Pre-amplifier	H.P	87405A	2944A06481	<input checked="" type="checkbox"/>
Pre-amplifier	H.P	8449B	3008A00121	<input checked="" type="checkbox"/>
Power Meter	Agilent	E4416A	GB41290751	
Power Sensor	Agilent	E9323A	US40410488	
Active Loop Antenna	EMCO	6507	1435	
Bi-Log Antenna	Schwarzbeck	VULB9160	3121	<input checked="" type="checkbox"/>
Bi-Log Antenna	Schwarzbeck	VULB9160	3141	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH System Inc	SAS-571	500	<input checked="" type="checkbox"/>
DC Power Supply	H.P	E3611A	KR41808575	
Temperature/Humidity Chamber	HANYOUNG	HY-LTH2	A33-051216	
Temperature/Humidity Chamber	HANYOUNG	HY-LTH-3	A34-970616	
Attenuator	H.P	8498A	1801A04842	
Attenuator	H.P	8491A	30907	<input checked="" type="checkbox"/>

2.3 Test Date

Date of Application : Feb 28, 2006

Date of Test : Feb 28, 2006 ~ May 10, 2006

2.4 Test Environment

See each test item's description.



3. DESCRIPTION OF THE EQUIPMENT UNDER TEST

The product specification described herein was obtained from the product data sheet or user's manual.

3.1 Rating and Physical Characteristics

Type (Model No.)	Remote controller for fingerprint Identification Doorlock (ERX-7100HR)
Power source	DC 6V (AAA Size Battery *4 EA)
Local Oscillator or X-Tal	X-Tal: 49MHz
Transmit Frequency	447.775MHz
Antenna Type	Whip Antenna, Integral
Type of Modulation	FSK
RF Output power	80 dBuV under
Interface Ports	N/A

3.2 Equipment Modifications

None.

3.3 Submitted Documents

Block diagram

Schematic diagram

Part List

User manual



4. MEASUREMENT CONDITIONS

4.1 Description of test configuration

The EUT was configured for testing in a typical fashion (as a user would normally use it).

During the exploratory tests, the EUT was set to transmit the control signal to conduct Subpart C tests.

4.2 List of Peripherals

Equipment Type	FCC ID	Manufacture	Model	Serial Number
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None

4.3 Type of Used Cables

Description	Length	Type of shield	Manufacturer	Remark
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None

4.4 Uncertainty

Radiated disturbance

U_c (Combined standard Uncertainty) = \pm 2.52 dB

Expanded uncertainty U = KU_c = \pm 5.05dB (K = 2)



5. TEST AND MEASUREMENTS

Summary of Test Results

Requirement	CFR Section	Report Section	Test Result
Antenna Requirement	15.203	5.1	PASS
Occupied bandwidth / Dwell Time	15.231(c), 15.231(a)(1)	5.2	PASS
Radiated Spurious Emissions	15.231(b), 15.205	5.3	PASS

5.1 ANTENNA REQUIREMENT

5.1.1 Regulation

FCC 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of Part 15C. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31 (d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.1.2 Result:

PASS

The transmitter has an whip antenna and meets the requirements of this section.



5.2 OCCUPIED BANDWIDTH / Dwell Time

5.2.1 Regulation

According to §15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

5.2.2 Test Procedure

ANSI C63.4-2003 Section 13.1.7, Occupied Bandwidth Measurements. The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the un-modulated carrier, even if atypical. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce worst-case (i.e., the widest) bandwidth.

The measurements were performed at operating Frequency (447.775 MHz). The spectrum trace data around fundamental frequency of the EUT was obtained with the spectrum analyzer in "Max Hold" mode. The bandwidth value was determined between the two points of 20dB down from the reference level.

5.2.3 Test Results:

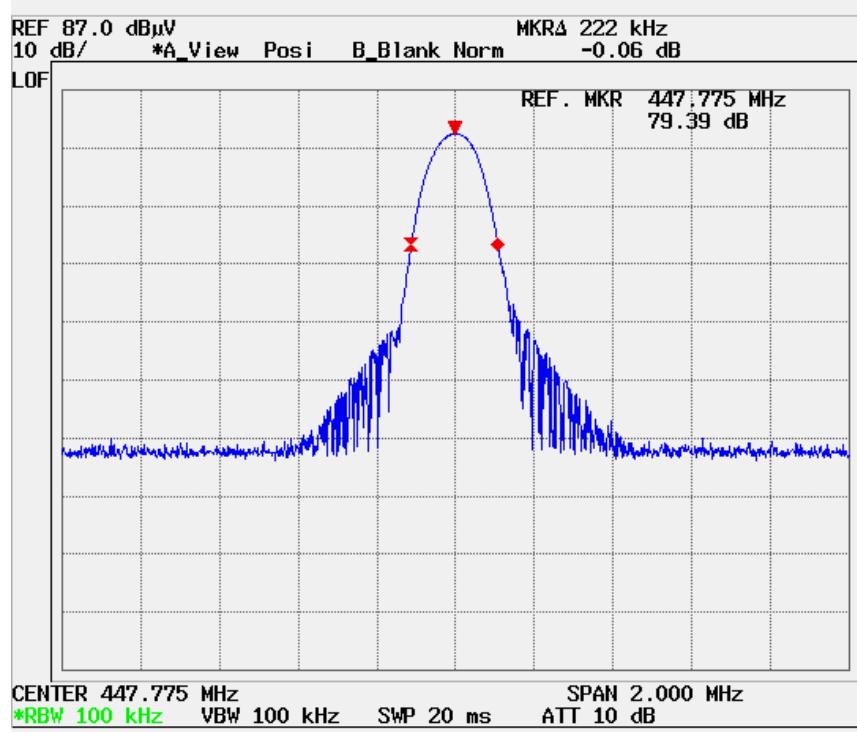
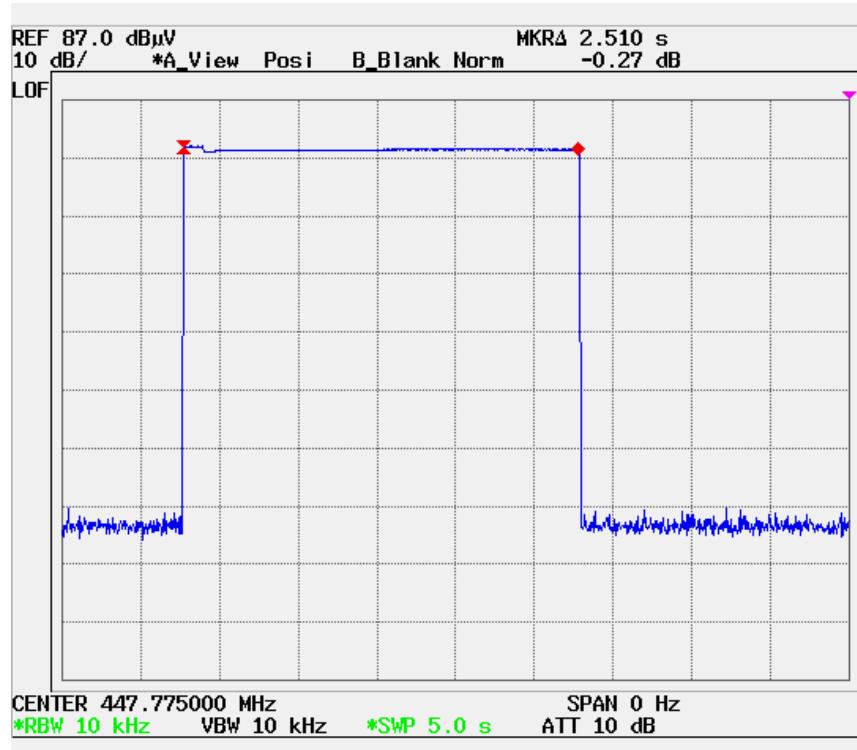
PASS

Measured values of the Occupied bandwidth

Center frequency (MHz)	Limit (kHz)	Measured occupied bandwidth (kHz)
447.775	1119.4	222

Measured values of the Dwell Time

Center frequency (MHz)	Limit (s)	Measured Dwell Time (s)
447.775	5	2.51

*Plot of the Occupied bandwidth**Plot of the Dwell Time*



5.3 RADIATED EMISSIONS

5.3.1 Regulation

According to §15.231(b), In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (uV/m @ 3m)	Field strength of Spurious Emissions (uV/m @ 3m)
40.66 ~ 40.70	2250	225
70 ~ 130	1250	125
130 ~ 174	1250 to 3750 **	125 to 375 **
174 ~ 260	3750	375
260 ~ 470	3750 to 12500 **	375 to 1250 **
Above 470	12500	1250

** linear interpolations

5.3.2 Test Procedure

Preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an anechoic chamber at a distance of 3 meters. The EUT was placed on the top of the 0.8 meter high, 1 x 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360°. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 30 to 1000 MHz using the Bi-Log antenna. Above 1 GHz, linearly polarized double ridge horn antenna was used.

To obtain the final test data, the EUT was arranged on a turntable situated on a 4x4 meter at the Open Area Test Site. The EUT was tested at a 3-meter test distance. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth. The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was operated in transmitting mode.



5.3.3 Test Results:

PASS

Measured values of the Field strength

Frequency (MHz)	Pol. (V/H)	AH/TA (m)/(°)	Reading (dBuV)	Amp Gain (dB)	AF + CL (dB/m)	Actual (dBuV/m)		Limit (dBuV/m)	Margin (dB)
						Peak	Average		
298.523	H	1.0 / 0	52.2	21.3	16.7	47.6	45.3	61.3	16.0
348.282	H	1.0 / 0	51.2	21.3	18.5	48.4	46.1	61.3	15.2
447.775	H	2.0 / 133	80.8	21.3	20.7	80.2	78.1	81.3	3.2
497.537	H	2.0 / 104	49.7	21.3	22.8	51.2	48.9	61.3	12.4
597.042	H	1.0 / 0	44.8	21.3	24.8	48.3	46.0	61.3	15.3
895.567	H	1.0 / 162	43.7	21.3	31.8	54.2	52.2	61.3	9.1
995.108	H	1.0 / 174	38.5	21.3	33.3	50.5	48.1	54.0	5.9
1343.34	H	1.0 / 166	51.1	21.3	17.5	47.3	44.9	54.0	9.1
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Note

1. H = Horizontal, V = Vertical Polarization.
2. AH= Antenna Height, TA=Table Angle
3. AF/CL = Antenna Factor and Cable Loss.
4. Amp Gain = Amp Gain + 3dB Attenuator
5. Resolution Bandwidth: 120 kHz for ranges below 1 GHz, 1 MHz for ranges over 1 GHz.
6. The frequency range was scanned from 30 MHz to 5 GHz. All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

$$\text{Margin (dB)} = \text{Limit} - \text{Actual}$$

$$[\text{Actual} = \text{Reading} - \text{Amp Gain} + \text{AF} + \text{CL}]$$