Korea Technology Institute Co., Ltd.

Test Report

Test Report No.:	**KTI03EF03001**		
Registration No.:	**99058**		
Applicant:	**Ditto Information Technology Inc.**		
Applicant Address:	**Jaewoo B/D 3F, 951-3 Dongcheon-Dong, Buk-Gu, Daegu South Korea**		
Product:	**Fingerprint Identification Door Lock**		
FCC ID:	**QZA**	**Model No.**	**S-200**
Receipt No.:	**03-0304**	**Date of receipt:**	**March 6, 2003**
Date of Issue:	**March 20, 2003**		
Testing location	**Korea Technology Institute Co., Ltd.** **51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeungki-Do, Korea**		
Test Standards:	**FCC/ANSI. C63.4: 2001**		
Rule Parts: FCC	**Part 15, Class B**		
Equipment Class:	**Digital Device**		
Test Result:	**The above-mentioned product has been tested with compliance.**		

Tested by: E.S.Park
/ Engineer

Signature **Date**

Approved by: G. C. Min
/President

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.

- This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S Government.

- We certify this test report has been based on the measurement standards that is traceable to the national or international standards.

≫ Contents ≪

≫ List of Tables

≫ List of Photographs

1. General

This equipment has been shown to be capable of compliance with the applicable technical standards and was tested in accordance with the measurement procedures as indicated in this report.

We attest to the accuracy of data. Korea Technology Institute Co., Ltd. performed all measurements reported herein. And were made under Chief Engineer' s supervisor.
We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. Test Site

Korea Technology Institute Co., Ltd.

2.1 Location

51-19, Sanglim3-Ri, Docheok-Myeun, Gwangju-Shi, Gyeungki-Do, Korea

The Test Site is in compliance with ANSI C63.4/2001 for measurement of radio Interference.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

- **Conducted Emissions**

Kind of Equipment	Type	S/N	Calibrated until
Spectrum Analyzer	R3261C	61720417	11.2003
Field Strength Meter	ESPC	832827/011	9.2003
LISN	KNW407	8-1157-2	10.2003
LISN	EM-7823	115019	1.2004
Conducted Cable	N/A	N/A	11.2003

- Radiated Emissions

Kind of Equipment	Type	S/N	Calibrated until
Field Strength Meter	ESPC	832827/011	9.2003
Spectrum Analyzer	R3261C	61720417	11.2003
Pre Amplifier	8447D	2944A06874	11.2003
BiconiLog Antenna	3142B	1705	12.2003
Bilog Antenna	CBL6140A	1217	5.2003
Open Site Cable	N/A	N/A	11.2003
Antenna Mast	DETT-03	N/A	N/A
Antenna & Turntable controller	DETT-04	91X519	N/A

2.3 Test Date

Date of Application: March 6, 2003

Date of Test: March 7, 2003

2.4 Test Environment

See each test item' s description.

3. Description of the tested samples

The EUT is Fingerprint Identification Door Lock.

3.1. Rating and Physical Characteristics

Sensor mode : Semiconductor sensor(Identification of inner skin fingerprint)
Authentication method : 1:N(Less than 1sec)
Number of template : 25template – Max 99 template(Include 3 master)
False Acceptance Rate : 0.0001
False Rejection Rate : 0.001
Duration of Battery : 1year 6months(Standard : 10access per day)

Submitted Documents

- User' s Guide

- Block Diagram

4. Measurement Conditions

Testing Input Voltage: DC 6V(AA Size*4)

4.1 Modes of Operation

The EUT was in the following operation mode during all testing;

1) Verify fingerprint.

4.2 Additional Equipment

DEVICE TYPE	Manufacturer	M/N	S/N	FCC ID
-	-	-	-	-

4.3 Uncertainty

1) Radiated disturbance

Uc (Combined standard Uncertainty) = ± 1.8dB

Expanded uncertainty U=KUc

K = 2

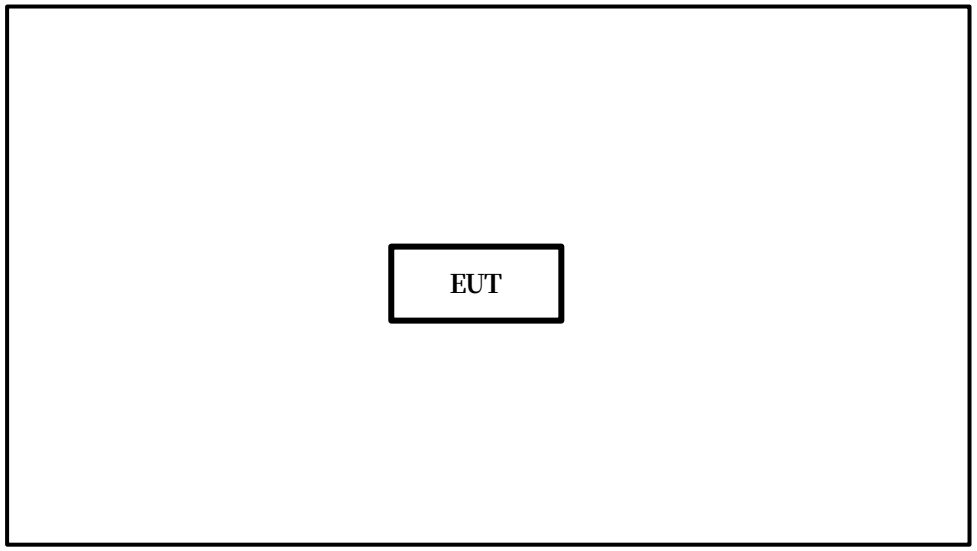
∴ U = ± 3.6dB

2) Conducted disturbance

Uc = ± 0.88dB

U = KUc=2 x Uc = ± 1.8dB

4.4 Test Setup



——— **Signal Line**

Power Line

5. EMISSION Test

5.1. Radiated Emissions

Result: **Pass**

Preliminary measurements were made indoors at 1 meter using broadband antennas, broadband Amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and Investigated. The system configurations, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 2000 MHz using BiconiLog Antenna. About 2GHz, Double ridged horn Antenna was used.

Final measurements were made outdoors at 10-meter test range using EMCO antennas. The test equipment was placed on a wooden table situated on a 4x4 meter area adjacent to the measurement area. Turntable was to protect from weather in the dome that made with Polyethylene film. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMIField Intensity Meter (ESIB40) R & S. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1 MHz depending on the frequency or type or signal.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated Measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8meter high non-metallic 1 x 1.5 meter table.

The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed, and/or support equipment, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in photograph of radiated emission test.

Each EME reported was calibrated using self-calibrating mode.

Table 3: Test Data, Radiated Emissions

Frequency (MHz)	Pol.	Height [m]	Angle [°]	(1) Reading (dBμV)	(2) AFCL (dB/m)	(3) Actual (dBμV/m)	(4) Limit (dBμV/m)	(5) Margin (dB)
84.04	V	3.72	196	23.4	7.69	31.09	40.0	8.91
365.0	H	2.02	167	14.8	18.91	33.71	46.0	12.29
630.48	V	1.98	35	12.7	27.30	40.00	46.0	6.00
958.72	V	1.35	17	12.7	30.67	40.94	46.0	5.06
977.52	V	1.28	26	11.5	30.33	39.58	54.0	14.42

Table. Radiated Measurements at 3-meters

Notes: 1.All modes of operation were investigated.
And the worst-case emissions are reported.

2.All other emission is non-significant.

3.All readings are calibrated by self-mode in receiver.

4.Measurements using CISPR quasi-peak mode.

5.AFCL = Antenna factor and cable loss

6.H = Horizontal, V = Vertical Polarization

7. The limit for Class B digital device is 100uV(40dBuV) from 30MHz to 88MHz, 150 uV (43.5dBuV) from 88MHz to 216MHz, 200uV(46dBuV) from 216MHz to 960MHz and 500 uV (54dBuV) from above 960MHz.

♠ Margin Calculation

(5) Margin = (4) Limit – (3) Actual

[(3) Actual = (1) Reading + (2) AFCL]