



Shenzhen Bontek Electronic Technology Co., Ltd.

EN 55022: 2006+A1: 2007
EN 55024: 1998+A2: 2003
EN 61000-3-2: 2006+A2: 2009
EN 61000-3-3: 2008
MEASUREMENT AND TEST REPORT

For
FINGERTEC WORLDWIDE SDN BHD

NO.6, 8 & 10, JALAN BK 3/2, BANDAR KINRARA, 47100 PUCHONG, SELANGOR,
MALAYSIA

MODEL: H2i

June 15, 2011

| | |
|---|---|
| This Report Concerns: <input checked="" type="checkbox"/> Original Report | Equipment Type: Fingerprint Access Control |
| Test By: | Yang yang/ <i>Yang Yang</i> |
| Report Number: | BCT11ER-0684E |
| Test Date: | May 23- Jun 15, 2011 |
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Bontek Compliance Testing Laboratory Ltd.



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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: **FINGERTEC WORLDWIDE SDN BHD**
Address of applicant: NO.6, 8 & 10, JALAN BK 3/2, BANDAR KINRARA, 47100
PUCHONG, SELANGOR, MALAYSIA
Manufacturer: **FINGERTEC WORLDWIDE LIMITED**
Address of manufacturer: Peking University Founder Shiyuan Science Park, Bao'an, Shenzhen,
China. 518108

General Description of E.U.T

EUT Description: **Fingerprint Access Control**
Model No.: **H2i**
Trade Mark: **FINGERTEC.**
Adapter Power Rating: **SWITCH MODE POWER SUPPLY**
Model No.:KSAFH1200300T1M3
Input:AC100-240~50/60Hz 1.2A
Output: DC12V 3A
Power Rating: **Input : 12VDC 3A**

Remark: * The test data gathered are from the production sample provided by the manufacturer.

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

EN 55022: 2006+A1: 2007

EN 55024: 1998+A2: 2003

EN 61000-3-2: 2006+A2: 2009

EN 61000-3-3: 2008

The objective of the manufacturer is to demonstrate compliance with the described standards above.



1.3 Test Summary

For the EUT described above. The standards used were EN 55022 Class B for Emissions & EN 55024 for Immunity.

Table 1 : Tests Carried Out Under EN 55022: 2006+A1: 2007

| Standard | Test Items | Status |
|------------------------|--|--------|
| EN 55022: 2006+A1:2007 | Disturbance Voltage at The Mains Terminals (0.15MHz To 30MHz) | √ |
| | Disturbance Voltage At The Network Terminals (0.15 MHz To 30MHz) | √ |
| | Radiated Disturbances (30MHz To 6GHz) | √ |

√ Indicates that the test is applicable
× Indicates that the test is not applicable

Table 2 : Tests Carried Out Under EN 61000-3-2: 2006+A2: 2009/ EN 61000-3-3: 2008

| Standard | Test Items | Status |
|-----------------------------|---------------------------------------|--------|
| EN 61000-3-2: 2006+A2: 2009 | Harmonic Current Test | √ |
| EN 61000-3-3: 2008 | Voltage Fluctuations and Flicker Test | √ |

√ Indicates that the test is applicable
× Indicates that the test is not applicable

Table 3 : Tests Carried Out Under EN 55024: 1998+A2: 2003

| Standard | Test Items | Status |
|-----------------------------|---|--------|
| EN 61000-4-2: 2009 | Electrostatic discharge Immunity | √ |
| EN 61000-4-3: 2006+A1: 2008 | Radiated Susceptibility (80MHz to 1GHz 1.4 GHz to 2.7GHz) | √ |
| EN 61000-4-4: 2004 | Electrical Fast Transient/Burst Immunity | √ |
| EN 61000-4-5: 2006 | Surge Immunity | √ |
| EN 61000-4-6: 2009 | Conducted Susceptibility (150kHz to 80MHz) | √ |
| EN 61000-4-8: 2001 | Power Frequency Magnetic Field Immunity (50/60Hz) | X |
| EN 61000-4-11: 2004 | Voltage Dips, Short Interruptions Immunity | √ |

√ Indicates that the test is applicable
× Indicates that the test is not applicable



1.4 Test Methodology

All measurements contained in this report were conducted with CISPR 16-1: 2002, radio disturbance and immunity measuring apparatus, and CISPR16-2: 2002, Method of measurement of disturbances and immunity.

All measurement required was performed at Shenzhen Bontek Electronic Technology Co.,Ltd. at 1/F,Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 338263

Shenzhen Bontek Electronic Technology Co.,Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March, 2008.

IC Registration No.: 7631A

The 3m alternate test site of Shenzhen Bontek Electronic Technology Co.,Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on August 2009.

The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

CNAS - Registration No.: L3923

Shenzhen Bontek Electronic Technology Co.,Ltd. to ISO/IEC 17025:25 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. The acceptance letter from the CNAS is maintained in our files: Registration:L3923,February,2009.

TUV - Registration No.: UA 50203122-0001

Shenzhen Bontek Electronic Technology Co.,Ltd. An assessment of the laboratory was conducted according to the "Procedures and Conditions for EMC Test Laboratories"with reference to EN ISO/IEC 17025 by a TUV Rheinland auditor. Audit Report NO. 17010783-002

**1.6 Test Equipment List and Details**

Test equipments list of Shenzhen Bontek Electronic Technology Co.,Ltd.

| No. | Instrument no. | Equipment | Manufacturer | Model No. | S/N | alibration Date | alibration Due Date |
|-----|----------------|--|-----------------|-----------------------------|------------|-----------------|---------------------|
| 1 | BCT-EMC 001 | EMI Test Receiver | R&S | ESCI | 100687 | 2011-4-07 | 2012-4-06 |
| 2 | BCT-EMC 002 | EMI Test Receiver | R&S | ESPI | 100097 | 2011-4-07 | 2012-4-06 |
| 3 | BCT-EMC 003 | Amplifier | HP | 8447D | 1937A02492 | 2011-4-07 | 2012-4-06 |
| 4 | BCT-EMC 004 | Single Power Conductor Module | FCC | FCC-LISN-5-50-1-01-CISP R25 | 7101 | 2011-4-07 | 2012-4-06 |
| 5 | BCT-EMC 005 | Single Power Conductor Module | FCC | FCC-LISN-5-50-1-01-CISP R25 | 7102 | 2011-4-07 | 2012-4-06 |
| 6 | BCT-EMC 006 | Power Clamp | SCHWARZBECK | MDS-21 | 3812 | 2011-4-07 | 2012-4-06 |
| 7 | BCT-EMC 007 | Positioning Controller | C&C | CC-C-1F | MF7802113 | N/A | N/A |
| 8 | BCT-EMC 008 | Electrostatic Discharge Simulator | TESEQ | NSG437 | 125 | 2011-4-07 | 2012-4-06 |
| 9 | BCT-EMC 009 | Fast Transient Burst Generator | SCHAFFNER | MODULA6150 | 34572 | 2011-4-07 | 2012-4-06 |
| 10 | BCT-EMC 010 | Fast Transient Noise Simulator | Noiseken | FNS-105AX | 31485 | 2011-4-07 | 2012-4-06 |
| 11 | BCT-EMC 011 | Color TV Pattern Generator | PHILIPS | PM5418 | TM209947 | N/A | N/A |
| 12 | BCT-EMC 012 | Power Frequency Magnetic Field Generator | EVERFINE | EMS61000-8K | 608002 | 2011-4-07 | 2012-4-06 |
| 14 | BCT-EMC 013 | Capacitive Coupling Clamp | TESEQ | CDN8014 | 25096 | 2011-4-07 | 2012-4-06 |
| 15 | BCT-EMC 014 | High Field Biconical Antenna | ELECTRO-METRICS | EM-6913 | 166 | 2010-4-14 | 2012-4-13 |
| 16 | BCT-EMC 015 | Log Periodic Antenna | ELECTRO-METRICS | EM-6950 | 811 | 2010-4-14 | 2012-4-13 |
| 17 | BCT-EMC 016 | Remote Active Vertical Antenna | ELECTRO-METRICS | EM-6892 | 304 | 2010-4-14 | 2012-4-13 |
| 18 | BCT-EMC 017 | TRILOG Broadband Test-Antenna | SCHWARZBECK | VULB9163 | 9163-324 | 2010-4-14 | 2012-4-13 |



| | | | | | | | |
|----|-------------|------------------------------|---------------------|---------------|----------------|-----------|-----------|
| 19 | BCT-EMC 018 | Horn Antenna | SCHWARZBECK | BBHA9120A | B08000991-0001 | 2010-4-14 | 2012-4-13 |
| 20 | BCT-EMC 019 | Teo Line Single Phase Module | SCHWARZBECK | NSLK8128 | D-69250 | 2011-4-07 | 2012-4-06 |
| 21 | BCT-EMC 020 | 10dB attenuator | SCHWARZBECK | MTAIMP-136 | R65.90.0001#06 | 2011-4-07 | 2012-4-06 |
| 22 | BCT-EMC 021 | Electric bridge | Zentech | 100 LCR METER | 803024 | N/A | N/A |
| 23 | BCT-EMC 022 | RF Current Probe | FCC | F-33-4 | 80 | 2011-4-07 | 2012-4-06 |
| 24 | BCT-EMC 023 | Triple-Loop Antenna | EVERFINE | LLA-2 | 607004 | 2011-4-07 | 2012-4-06 |
| 25 | BCT-EMC 024 | CDN | FRANKONIA | M2+M3 | A3027019 | 2011-4-07 | 2012-4-06 |
| 26 | BCT-EMC 025 | 6dB Attenuator | FRANKONIA | 75-A-FFN-06 | 1001698 | 2011-4-07 | 2012-4-06 |
| 27 | BCT-EMC 026 | EMV-Mess-System GMBH | FRANKONIA | FLL-75 | 1020A1109 | 2011-4-07 | 2012-4-06 |
| 28 | BCT-EMC 027 | EM Injection Clamp | FCC | F-203I-13mm | 91536 | 2011-4-07 | 2012-4-06 |
| 29 | BCT-EMC 028 | 9KHz-2.4GHz Signal generator | MARCONI INSTRUMENTS | 2024 | 112260/042 | 2011-4-07 | 2012-4-06 |
| 30 | BCT-EMC 029 | Broadband Preamplifier | SCHWARZBECK | BBV 9718 | 9718-182 | 2011-4-07 | 2012-4-06 |
| 31 | BCT-EMC 030 | Harmonics & Flicker Analyzer | Voltech | PM6000 | 200006700433 | 2011-4-07 | 2012-4-06 |
| 32 | BCT-EMC 031 | Spectrum Analyzer | R&S | FSP30 | 1093.4495.30 | 2011-4-07 | 2012-4-06 |



2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being normal operation.

2.3 Special Accessories

As shown in section 2.5, interface cable used for compliance testing is shielded as normally supplied by FINGERTEC WORLDWIDE SDN BHD and its respective support equipment manufacturers.

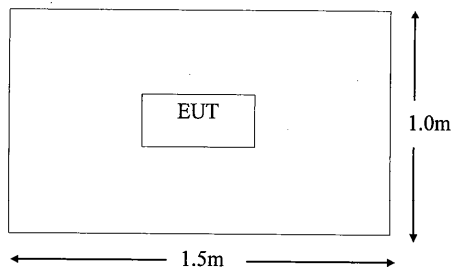
2.4 Equipment Modifications

The EUT tested was not modified by BCT.



EUT

2.5 Test Setup Diagram





3 - DISTURBANCE VOLTAGE AT THE MAINS TERMINALS

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

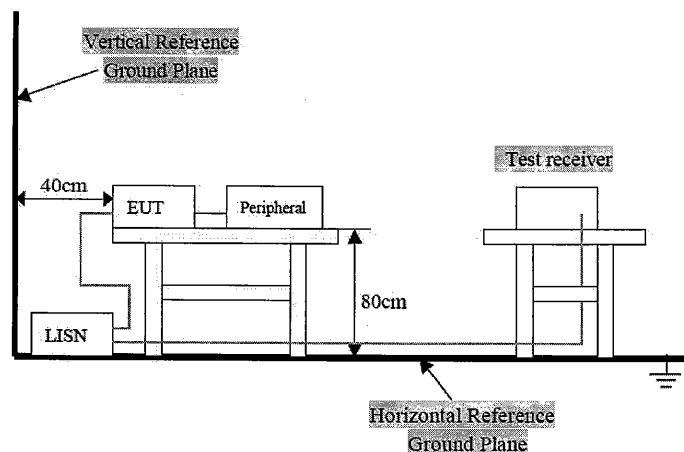
The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is 3.4 dB.

3.2 Limit of Disturbance Voltage At The Mains Terminals (Class B)

| Frequency Range (MHz) | Limits (dBuV) | |
|-----------------------|----------------|---------|
| | Quasi-Peak | Average |
| 0.150~0.500 | 66~56 | 56~46 |
| 0.500~5.000 | 56 | 46 |
| 5.000~30.00 | 60 | 50 |

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

3.3 EUT Setup



3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
Detector.....Peak & Quasi-Peak & Average
Sweep Speed.....Auto
IF Band Width.....9 KHz



3.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with a "AV".

3.6 Summary of Test Results

According to the data in section 3.6, the EUT complied with the EN 55022 Conducted margin, with the *worst* margin reading of:

3.7 Disturbance Voltage Test Data

| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~25 |
| Humidity (%RH) | 50~60 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

Test data see following pages

3.8 Test Result

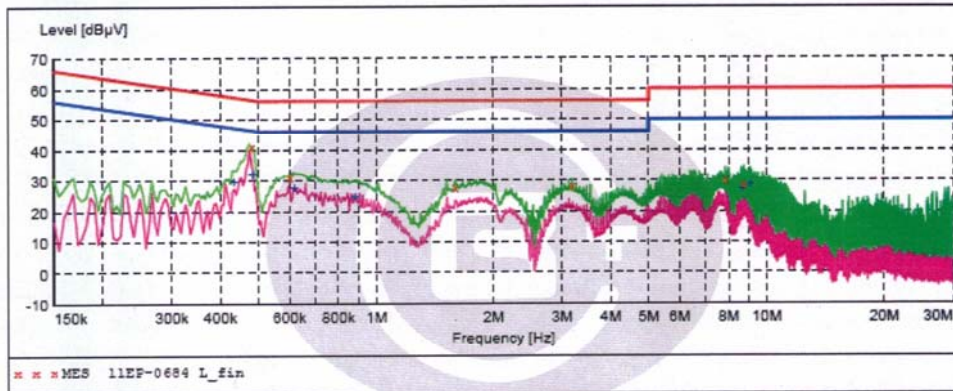
PASS



Conducted Emission Test Data

EUT: Fingerprint Access Control
M/N: H2i
Operating Condition: Normal operation
Test Site: Shielded Room
Operator: Chen
Test Specification: AC 230V/50Hz for Adapter
Comment: Live Line
Start of Test: 5/23/2011/ 19:59 Tem:24℃ Hum:60%

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "11EP-0684 L_fin"

5/23/2011 19:59

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.478500 | 40.80 | 9.9 | 56 | 15.6 | QP | L1 | GND |
| 0.600000 | 31.10 | 9.9 | 56 | 24.9 | QP | L1 | GND |
| 1.594500 | 27.90 | 9.9 | 56 | 28.1 | QP | L1 | GND |
| 3.192000 | 28.30 | 10.0 | 56 | 27.7 | QP | L1 | GND |
| 7.845000 | 30.20 | 10.1 | 60 | 29.8 | QP | L1 | GND |
| 8.745000 | 28.70 | 10.2 | 60 | 31.3 | QP | L1 | GND |

MEASUREMENT RESULT: "11EP-0684 L_fin2"

5/23/2011 19:59

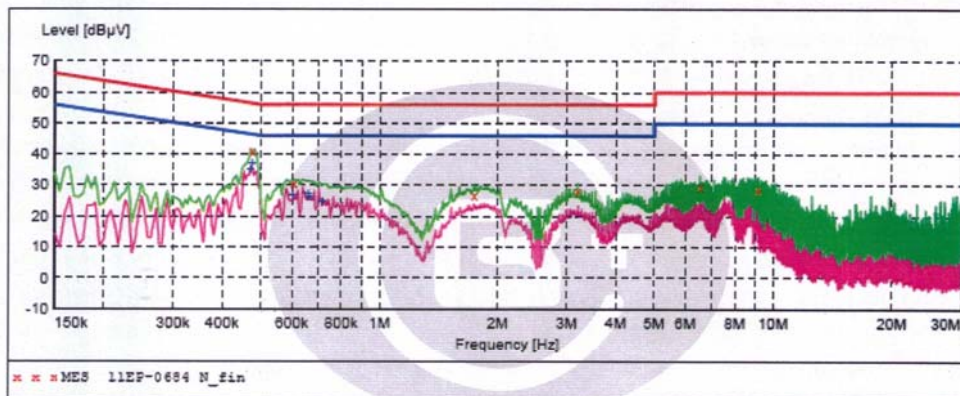
| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.433500 | 29.60 | 9.9 | 47 | 17.6 | AV | L1 | GND |
| 0.483000 | 32.30 | 9.9 | 46 | 14.0 | AV | L1 | GND |
| 0.618000 | 27.50 | 9.9 | 46 | 18.5 | AV | L1 | GND |
| 0.883500 | 24.60 | 10.0 | 46 | 21.4 | AV | L1 | GND |
| 8.677500 | 27.00 | 10.2 | 50 | 23.0 | AV | L1 | GND |
| 9.096000 | 28.60 | 10.2 | 50 | 21.4 | AV | L1 | GND |



Conducted Emission Test Data

EUT: Fingerprint Access Control
M/N: H2i
Operating Condition: Normal operation
Test Site: Shielded Room
Operator: Chen
Test Specification: AC 230V/50Hz for Adapter
Comment: Neutral Line
Start of Test: 5/23/2011/ 19:55 Tem:24°C Hum:60%

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "11EP-0684 N_fin"

5/23/2011 19:55

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.474000 | 40.80 | 9.9 | 56 | 15.6 | QP | N | GND |
| 0.604500 | 30.60 | 9.9 | 56 | 25.4 | QP | N | GND |
| 1.738500 | 26.70 | 9.9 | 56 | 29.3 | QP | N | GND |
| 3.192000 | 28.20 | 10.0 | 56 | 27.8 | QP | N | GND |
| 6.522000 | 29.50 | 10.0 | 60 | 30.5 | QP | N | GND |
| 9.159000 | 28.60 | 10.1 | 60 | 31.4 | QP | N | GND |

MEASUREMENT RESULT: "11EP-0684 N_fin2"

5/23/2011 19:55

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.469500 | 35.30 | 9.9 | 47 | 11.2 | AV | N | GND |
| 0.474000 | 37.00 | 9.9 | 46 | 9.4 | AV | N | GND |
| 0.600000 | 26.60 | 9.9 | 46 | 19.4 | AV | N | GND |
| 0.658500 | 27.10 | 9.9 | 46 | 18.9 | AV | N | GND |
| 0.663000 | 26.00 | 9.9 | 46 | 20.0 | AV | N | GND |
| 0.717000 | 24.90 | 9.9 | 46 | 21.1 | AV | N | GND |



4 - DISTURBANCE VOLTAGE AT THE NETWORK TERMINALS

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is +2.4 dB.

4.2 Limit of Disturbance Voltage at The Network Terminals (Class B)

| Frequency Range (MHz) | Limits (dBuV) | |
|-----------------------|----------------|---------|
| | Quasi-Peak | Average |
| 0.150~0.500 | 84~74 | 74~64 |
| 0.5000~30.00 | 74 | 64 |

Note: (1) The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz

4.3 EUT Setup

The setup of EUT is according with CISPR 16-1: 2002, CISPR16-2: 2002 measurement procedure. The specification used was the EN 55022 limits.

The EUT was placed center and the back edge of the test table.

The AV cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

4.4 Instruments Setup

The receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
Detector.....Peak & Quasi-Peak & Average
Sweep Speed.....Auto
IF Band Width.....9 KHz



4.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with a "AV".

4.6 Summary of Test Results

According to the data in section 3.6, the EUT complied with the EN 55022 Conducted margin, with the worst margin reading of:

4.7 Disturbance Voltage Test Data

| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~23 |
| Humidity (%RH) | 50~60 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

Test data see following pages

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.

(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

4.8 Test Result

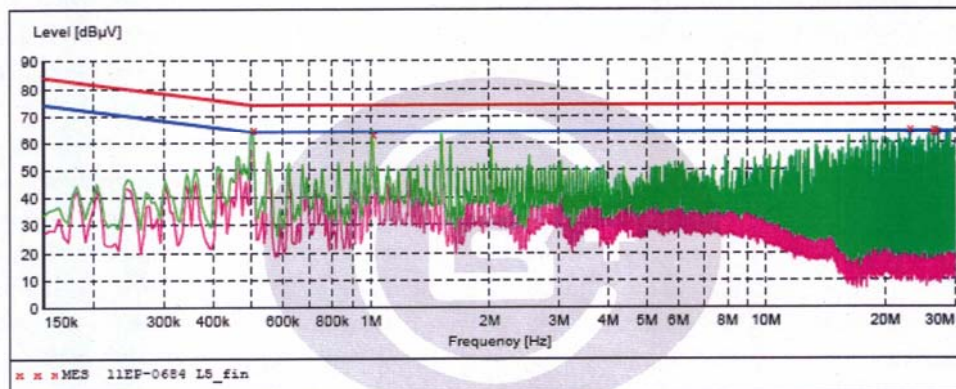
Pass



Conducted Emission Test Data

EUT: Fingerprint Access Control
M/N: H2i
Operating Condition: Normal operation
Test Site: Shielded Room
Operator: Chen
Test Specification: AC 230V/50Hz for Adapter
Comment: LAN Line
Start of Test: 5/23/2011/ 20:25 Tem:24°C Hum:60%

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "11EP-0684 L5_fin"

5/23/2011 20:25

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.505500 | 64.80 | 9.9 | 74 | 9.2 | QP | LAN | GND |
| 1.014000 | 63.50 | 9.9 | 74 | 10.5 | QP | LAN | GND |
| 23.127000 | 65.00 | 9.6 | 74 | 9.0 | QP | LAN | GND |
| 26.488500 | 64.00 | 9.8 | 74 | 10.0 | QP | LAN | GND |
| 26.610000 | 64.90 | 9.8 | 74 | 9.1 | QP | LAN | GND |
| 27.159000 | 64.50 | 9.9 | 74 | 9.5 | QP | LAN | GND |

MEASUREMENT RESULT: "11EP-0684 L5_fin2"

5/23/2011 20:25

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Detector | Line | PE |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.505500 | 63.80 | 9.9 | 64 | 0.2 | AV | LAN | GND |
| 1.014000 | 63.20 | 9.9 | 64 | 0.8 | AV | LAN | GND |
| 23.127000 | 63.40 | 9.6 | 64 | 0.6 | AV | LAN | GND |
| 26.610000 | 63.40 | 9.8 | 64 | 0.6 | AV | LAN | GND |
| 27.159000 | 63.30 | 9.9 | 64 | 0.7 | AV | LAN | GND |
| 28.684500 | 63.50 | 10.0 | 64 | 0.5 | AV | LAN | GND |



5 - RADIATED DISTURBANCES

5.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is 4.0 dB.

5.2 Limit of Radiated Disturbances (Class B)

| Frequency (MHz) | Distance (Meters) | Field Strengths Limits (dB μ V/m) |
|-----------------|-------------------|---------------------------------------|
| 30 ~ 230 | 3 | 40 |
| 230 ~ 1000 | 3 | 47 |

| Frequency (MHz) | Distance (Meters) | Field Strengths Limits AV(dB μ V/m) | Field Strengths Limits PK(dB μ V/m) |
|-----------------|-------------------|---|---|
| 1000~3000 | 3 | 50 | 70 |
| 3000-6000 | 3 | 54 | 74 |

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

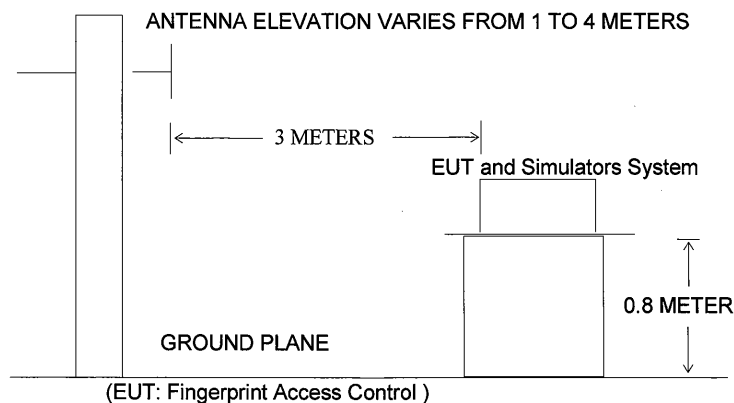
5.3 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the CISPR 16-1: 2002, CISPR16-2: 2002. The specification used was EN 55022 Class B limits.

The EUT was placed on the center of the test table.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

Block diagram of test setup (In chamber)





5.4 Test Receiver Setup

According to EN 55022 rules, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector.....Peak & Quasi-Peak
IF Band Width.....120KHz
Frequency Range.....30MHz to 1000MHz
Turntable Rotated.....0 to 360 degrees

Antenna Position:

Height.....1m to 4m
Polarity.....Horizontal and Vertical

5.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dB μ V of specification limits), and are distinguished with a "QP" in the data table.

5.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Class B Limit} - \text{Corr. Ampl.}$$

5.7 Radiated Emissions Test Result

| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~25 |
| Humidity (%RH) | 50~55 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

5.8 Test Result

PASS

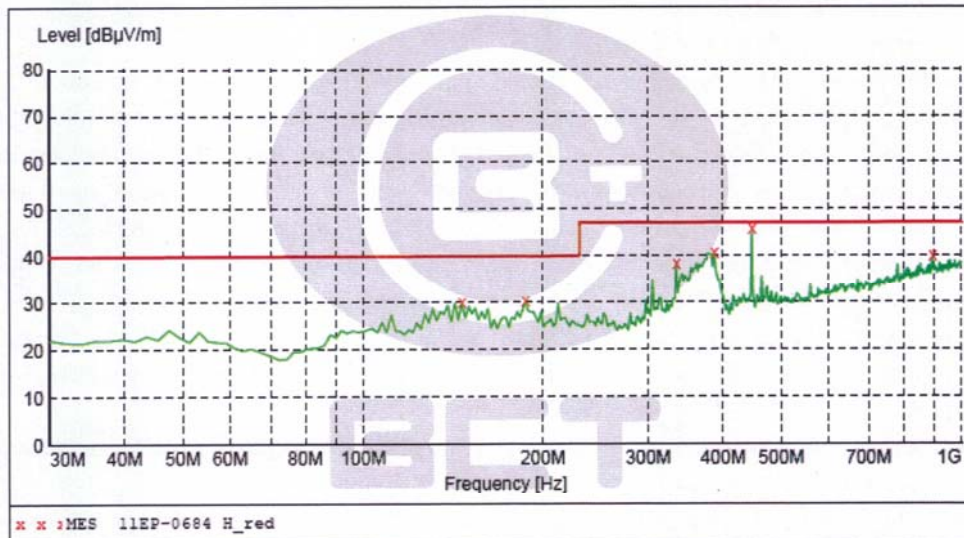


Radiated Emission Test Data

EUT: Fingerprint Access Control
M/N: H2i
Operating Condition: Normal operation
Test Site: 3m CHAMBER
Operator: Yang
Test Specification: AC 230V/50Hz for Adapter
Comment: Polarization: Horizontal
Start of Test: 5/26/2011/ 14:38 Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

| Short Description: | | Field Strength | | | |
|--------------------|-----------|----------------|------------|-----------|--------------|
| Start | Stop | Detector | Meas. Time | IF Bandw. | Transducer |
| Frequency | Frequency | | | | |
| 30.0 MHz | 1.0 GHz | MaxPeak | Coupled | 100 kHz | VULB9163 NEW |



MEASUREMENT RESULT: "11EP-0684 H_red"

5/26/2011 14:38

| Frequency MHz | Level dBμV/m | Transd dB | Limit dBμV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 146.400000 | 29.80 | 13.2 | 40.0 | 10.2 | QP | 100.0 | 0.00 | HORIZONTAL |
| 187.140000 | 30.10 | 15.8 | 40.0 | 9.9 | QP | 100.0 | 0.00 | HORIZONTAL |
| 334.580000 | 38.20 | 19.9 | 47.0 | 8.8 | QP | 100.0 | 0.00 | HORIZONTAL |
| 386.960000 | 40.70 | 21.1 | 47.0 | 6.3 | QP | 100.0 | 0.00 | HORIZONTAL |
| 447.100000 | 45.90 | 22.1 | 47.0 | 1.1 | QP | 100.0 | 0.00 | HORIZONTAL |
| 895.240000 | 40.10 | 31.1 | 47.0 | 6.9 | QP | 300.0 | 0.00 | HORIZONTAL |

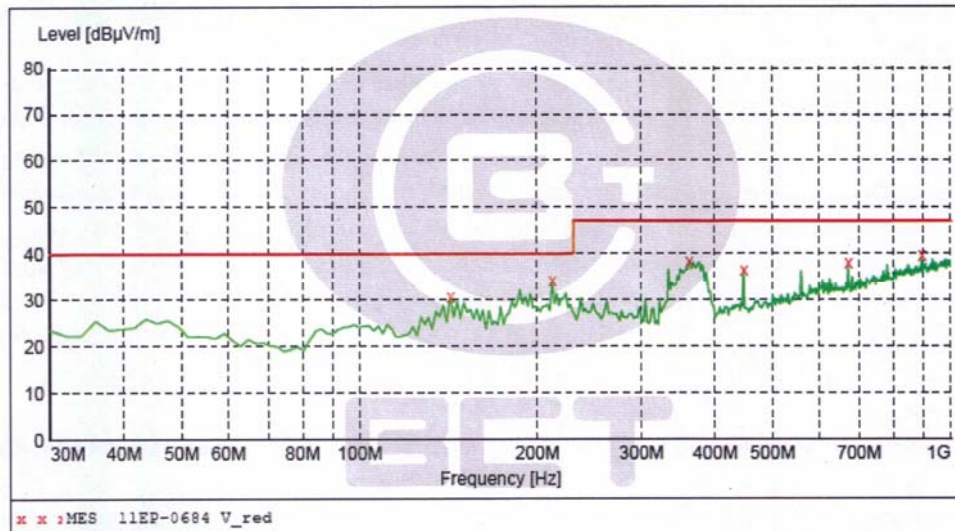


Radiated Emission Test Data

EUT: Fingerprint Access Control
M/N: H2i
Operating Condition: Normal operation
Test Site: 3m CHAMBER
Operator: Yang
Test Specification: AC 230V/50Hz for Adapter
Comment: Polarization: Vertical
Start of Test: 5/26/2011/ 14:34 Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

| Short Description: | | Field Strength | | | |
|--------------------|-----------|----------------|------------|-----------|--------------|
| Start | Stop | Detector | Meas. Time | IF Bandw. | Transducer |
| Frequency | Frequency | | | | |
| 30.0 MHz | 1.0 GHz | MaxPeak | Coupled | 100 kHz | VULB9163 NEW |



MEASUREMENT RESULT: "11EP-0684 V_red"

| 5/26/2011 14:34 | | | | | | | | | |
|-----------------|--------|--------|--------|--------|------|--------|---------|--------------|--|
| Frequency | Level | Transd | Limit | Margin | Det. | Height | Azimuth | Polarization | |
| MHz | dBμV/m | dB | dBμV/m | dB | | cm | deg | | |
| 142.520000 | 30.70 | 13.1 | 40.0 | 9.3 | QP | 100.0 | 0.00 | VERTICAL | |
| 212.360000 | 34.20 | 16.1 | 40.0 | 5.8 | QP | 100.0 | 0.00 | VERTICAL | |
| 361.740000 | 38.40 | 20.6 | 47.0 | 8.6 | QP | 100.0 | 0.00 | VERTICAL | |
| 447.100000 | 36.40 | 22.1 | 47.0 | 10.6 | QP | 100.0 | 0.00 | VERTICAL | |
| 672.140000 | 37.90 | 27.2 | 47.0 | 9.1 | QP | 100.0 | 0.00 | VERTICAL | |
| 895.240000 | 39.60 | 31.1 | 47.0 | 7.4 | QP | 100.0 | 0.00 | VERTICAL | |

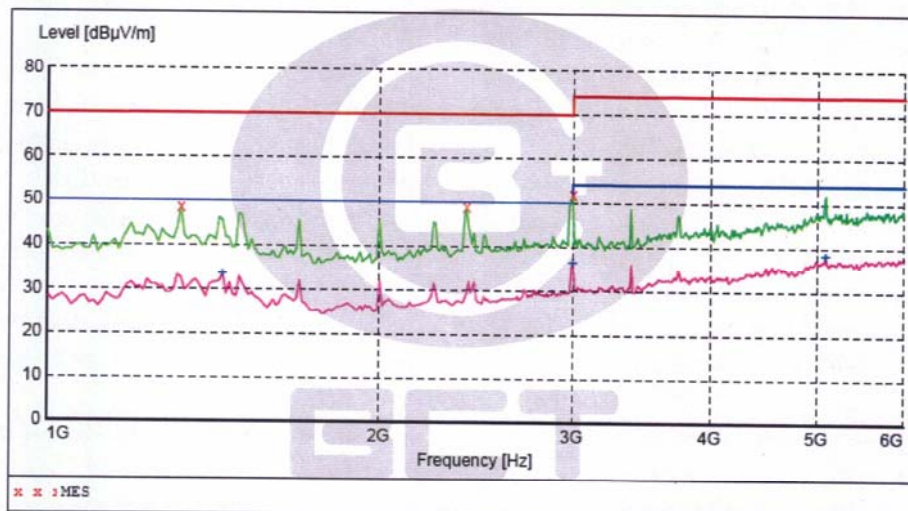


Radiated Emission Test Data of above 1GHz:

EUT: Fingerprint Access Control
M/N: H2i
Operating Condition: Normal operation
Test Site: 3m CHAMBER
Operator: Yang
Test Specification: AC 230V/50Hz for Adapter
Comment: Polarization: Horizontal
Start of Test: 5/26/2011/ 14:50 Tem:25°C Hum:50%

SWEEP TABLE: "test (1G-6G)"

| Short Description: | | Field Strength | | | |
|--------------------|-----------|----------------|------------|-----------|-------------|
| Start | Stop | Detector | Meas. Time | IF Bandw. | Transducer |
| Frequency | Frequency | | | | |
| 1.0 GHz | 6.0 GHz | MaxPeak | Coupled | 1 MHz | BBHA 9120 A |
| | | Average | | | |



MEASUREMENT RESULT:

| Frequency MHz | Level dBuV/m | Transd dB | Limit dBuV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|---------------|--------------|-----------|--------------|-----------|------|-----------|-------------|--------------|
| 1320.000000 | 48.60 | -11.4 | 70.0 | 21.4 | PK | 100.0 | 0.00 | HORIZONTAL |
| 2400.000000 | 49.00 | -7.6 | 70.0 | 21.0 | PK | 100.0 | 0.00 | HORIZONTAL |
| 3000.000000 | 51.60 | -5.9 | 70.0 | 18.4 | PK | 100.0 | 0.00 | HORIZONTAL |

MEASUREMENT RESULT:

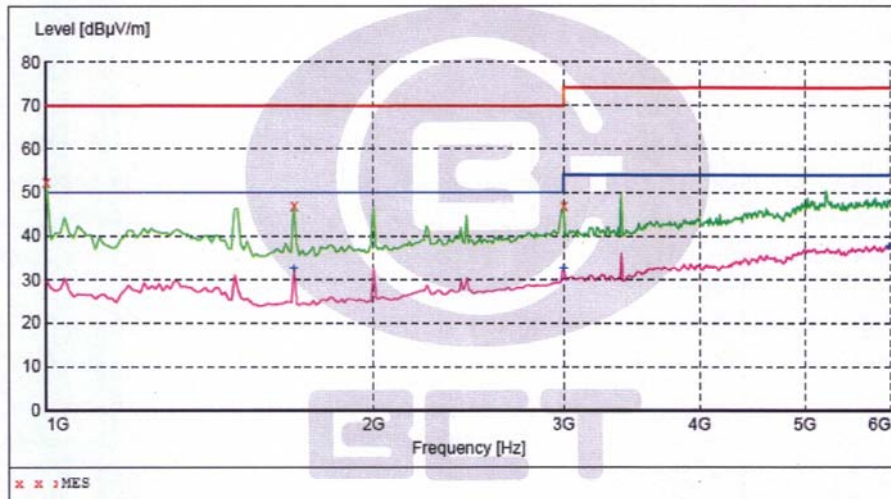
| Frequency MHz | Level dBuV/m | Transd dB | Limit dBuV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|---------------|--------------|-----------|--------------|-----------|------|-----------|-------------|--------------|
| 1440.000000 | 33.40 | -11.1 | 50.0 | 16.6 | AV | 100.0 | 0.00 | HORIZONTAL |
| 3000.000000 | 36.20 | -5.9 | 50.0 | 13.8 | AV | 100.0 | 0.00 | HORIZONTAL |
| 5090.000000 | 38.30 | 2.9 | 54.0 | 15.7 | AV | 100.0 | 0.00 | HORIZONTAL |



Radiated Emission Test Data of above 1GHz:

EUT: Fingerprint Access Control
M/N: H2i
Operating Condition: Normal operation
Test Site: 3m CHAMBER
Operator: Yang
Test Specification: AC 230V/50Hz for Adapter
Comment: Polarization: Vertical
Start of Test: 5/26/2011/ 14:52 Tem:25°C Hum:50%

SWEEP TABLE: "test (1G-6G)"
Short Description: Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.0 GHz 6.0 GHz MaxPeak Coupled 1 MHz BBHA 9120 A
Average



MEASUREMENT RESULT:

| Frequency MHz | Level dBuV/m | Transd dB | Limit dBuV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 1000.000000 | 52.50 | -12.8 | 70.0 | 17.5 | PK | 100.0 | 0.00 | VERTICAL |
| 1690.000000 | 47.00 | -10.7 | 70.0 | 23.0 | PK | 100.0 | 0.00 | VERTICAL |
| 3000.000000 | 46.90 | -5.9 | 70.0 | 23.1 | PK | 100.0 | 0.00 | VERTICAL |

MEASUREMENT RESULT:

| Frequency MHz | Level dBuV/m | Transd dB | Limit dBuV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 1690.000000 | 32.50 | -10.7 | 50.0 | 17.5 | AV | 100.0 | 0.00 | VERTICAL |
| 3000.000000 | 32.40 | -5.9 | 50.0 | 17.6 | AV | 100.0 | 0.00 | VERTICAL |
| 5980.000000 | 37.60 | 4.2 | 54.0 | 16.4 | AV | 100.0 | 0.00 | VERTICAL |



6 - HARMONIC CURRENT TEST (EN 61000-3-2)

6.1 Application of Harmonic Current Emission

Compliance to these standards ensures that tested equipment will not generate harmonic currents at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

6.2 Measurement Data

Note: For detailed test data, refer to the following pages:

| | |
|-------------------|---|
| Standard used: | EN/IEC 61000-3-2 A14 (2006+A2: 2009) Quasi-stationary - Equipment class A |
| Observation time: | 150s |
| E. U. T.: | Fingerprint Access Control |
| M/N | H2i |
| Operation Mode | Normal operation |

Note: The EUT's power is lower than 75W, this test isn't applicable.



7 - VOLTAGE FLUCTUATIONS AND FLICKER TEST (EN 61000-3-3)

7.1 Application of Voltage Fluctuations and Flicker Test

Compliance to these standards ensures that tested equipment will not generate flickers and voltage change at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

7.2 Measurement Data

Note: For detailed test data, refer to the following pages:

| | |
|-------------------|--------------------------------|
| Standard used: | EN/IEC 61000-3-3 Flicker |
| Short time (Pst): | 10 min |
| Observation time: | 10 min (1 Flicker measurement) |
| Flickermeter: | 230V/50Hz |
| E. U. T.: | Fingerprint Access Control |
| M/N | H2i |
| Operation Mode | Normal operation |

7.3 Test Results

PASS

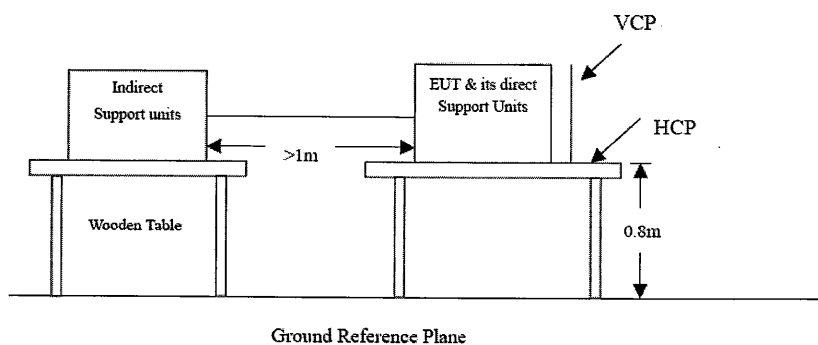
Maximum Flicker results

| | Pst | dc (%) | dmax (%) | d(t) > 3.3%(ms) |
|-----------|-------|--------|----------|-----------------|
| Limit | 1.000 | 3.300 | 4.000 | 500 |
| Reading 1 | 0.086 | 0.003 | 0.191 | 0 |



8- ELECTROSTATIC DISCHARGE IMMUNITY TEST (IEC 61000-4-2)

8.1 Block Diagram of Test Setup



8.2 Test Standard

EN55024: 1998+A2: 2003 (EN61000-4-2: 2009 Severity Level: 3 / Air Discharge: ± 8 KV Level: 2 / Contact Discharge: ± 4 KV)

8.3 Severity Levels and Performance Criterion

8.3.1 Severity level

| Level | Test Voltage Contact Discharge (KV) | Test Voltage Air Discharge (KV) |
|-------|--|------------------------------------|
| 1. | ± 2 | ± 2 |
| 2. | ± 4 | ± 4 |
| 3. | ± 6 | ± 8 |
| 4. | ± 8 | ± 15 |
| X | Special | Special |

8.3.2 Performance criterion : B

8.4 Operating Condition of EUT

8.4.1 Setup the EUT as shown on Section 8.1.

8.4.2 Turn on the power of all equipments.

8.4.3 Let the EUT work in measuring mode (Normal operation) and measure it.



8.5 Test Procedure

8.5.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

8.5.2 Contact Discharge:

All the procedure shall be same as Section 5.5.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.5.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

8.5.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.6 Test Results

PASS

Please refer to the following pages



| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~24 |
| Humidity (%RH) | 50~55 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

Table 1: Electrostatic Discharge Immunity (Air Discharge)

| IEC 61000-4-2 Test Points | Test Levels | | | | | | | | | |
|------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| | -2 kV | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV | -15 kV | +15 kV |
| Gap | A | A | A | A | A | A | A | A | / | / |
| LED | A | A | A | A | A | A | A | A | / | / |

Table 2: Electrostatic Discharge Immunity (Direct Contact)

| IEC 61000-4-2 Test Points | Test Levels | | | | | | | | | |
|------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| | -2 kV | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV | -15 kV | +15 kV |
| USB | A | A | A | A | / | / | / | / | / | / |
| DC port | A | A | A | A | / | / | / | / | / | / |

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

| IEC 61000-4-2 Test Points | Test Levels | | | | | | | | | |
|------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| | -2 kV | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV | -15 kV | +15 kV |
| Front Side | A | A | A | A | / | / | / | / | / | / |
| Back Side | A | A | A | A | / | / | / | / | / | / |
| Left Side | A | A | A | A | / | / | / | / | / | / |
| Right Side | A | A | A | A | / | / | / | / | / | / |

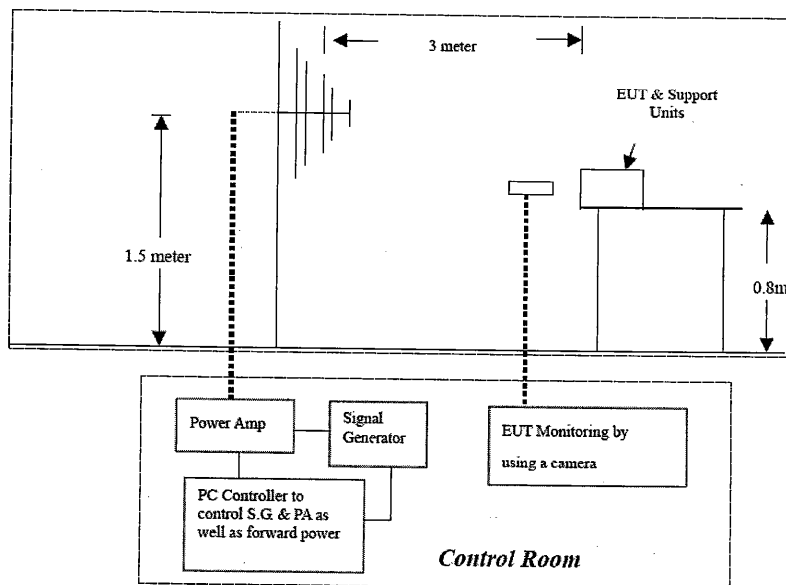
Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

| IEC 61000-4-2 Test Points | Test Levels | | | | | | | | | |
|------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| | -2 kV | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV | -15 kV | +15 kV |
| Front Side | A | A | A | A | / | / | / | / | / | / |
| Back Side | A | A | A | A | / | / | / | / | / | / |
| Left Side | A | A | A | A | / | / | / | / | / | / |
| Right Side | A | A | A | A | / | / | / | / | / | / |



9 - RF FIELD STRENGTH SUSCEPTIBILITY TEST (IEC 61000-4-3)

9.1 Block Diagram of Test



9.2 Test Standard

EN55024: 1998+A2: 2003 (EN61000-4-3: 2006+A1:2008, Severity Level: 2, 3V / m)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity Levels

| Level | Field Strength V/m |
|-------|--------------------|
| 1. | 1 |
| 2. | 3 |
| 3. | 10 |
| X | Special |

9.3.2 Performance Criterion: A



9.4 Operating Condition of EUT

- 9.4.1 Setup the EUT as shown on Section 9.1.
- 9.4.2 Turn on the power of all equipments.
- 9.4.3 Let the EUT work in measuring mode (Normal operation) and measure it..

9.5 Test Procedure

The EUT are placed on a table which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor its screen. All the scanning conditions are as following:

| Condition of Test | Remark |
|---------------------------|-------------------------|
| 1. Fielded Strength | 3V/m (Severity Level 2) |
| 2. Radiated Signal | Modulated |
| 3. Scanning Frequency | 80-1000MHz 1400-2700MHz |
| 4. Sweep time of radiated | 0.0015 Decade/s |
| 5. Dwell Time | 1 Sec. |

9.6 Test Results

PASS

Please refer to the following page.

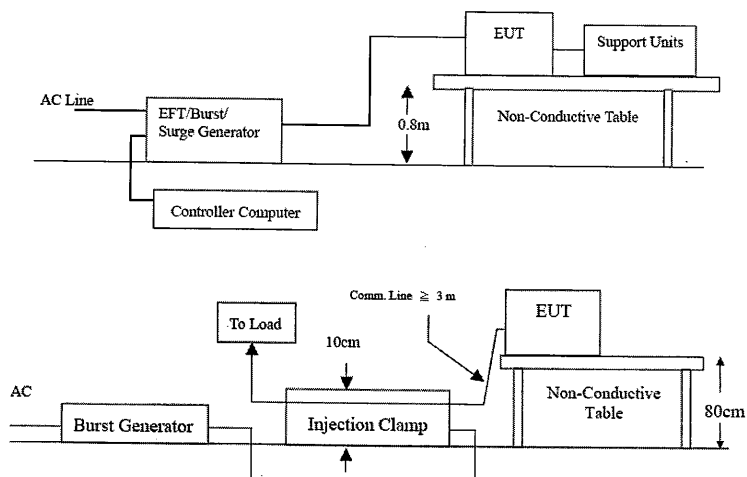
| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~24 |
| Humidity (%RH) | 50~55 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

| Frequency Range (MHz) | Front (3 V/m) | | Rear (3 V/m) | | Left Side (3 V/m) | | Right Side (3 V/m) | |
|-----------------------|---------------|------|--------------|------|-------------------|------|--------------------|------|
| | VERT | HORI | VERT | HORI | VERT | HORI | VERT | HORI |
| 80-1000 1400-2700 | A | A | A | A | A | A | A | A |



10 - ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (IEC 61000-4-4)

10.1 Block Diagram of Test Setup



10.2 Test Standard

EN55024: 1998+A2: 2003 (EN61000-4-4: 2004, Severity Level, Level 3: 2KV)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity level

| Open Circuit Output Test Voltage $\pm 10\%$ | | |
|---|-------------------------------------|---|
| Level | On Fingerprint Access Control Lines | On I/O (Input/Output) Signal data and control lines |
| 1. | 0.5 KV | 0.25 KV |
| 2. | 1 KV | 0.5 KV |
| 3. | 2 KV | 1 KV |
| 4. | 4 KV | 2 KV |
| X | Special | Special |

10.3.2 Performance criterion : B

10.4 Operating Condition of EUT

10.4.1 Setup the EUT as shown in Section 10.1.

10.4.2 Turn on the power of all equipments.

10.4.3 Let the EUT work in test mode (Normal operation) and measure it.



10.5 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

10.5.1 For input and output DC power ports:
It's unnecessary to test

10.5.2 For signal lines and control lines ports:
It's unnecessary to test.

10.5.3 For AC Input line ports:
The EUT is connected to the AC power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

10.6 Test Result

PASS

Please refer to the following page.

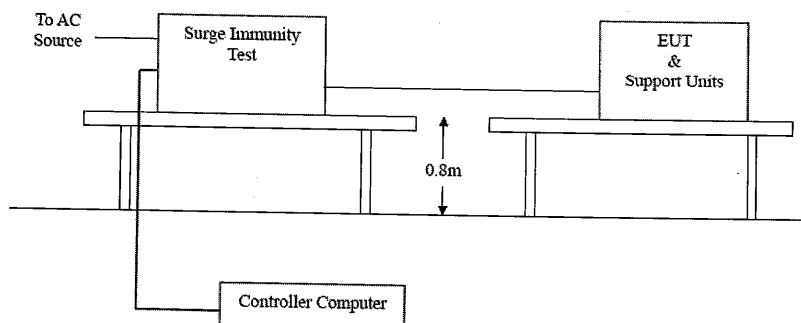
| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~24 |
| Humidity (%RH) | 50~55 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

| IEC 61000-4-4 Test Points | | Test Levels (kV) | | | | | | | |
|------------------------------|-------------|------------------|------|------|------|------|------|------|------|
| | | +0.5 | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| AC Power Supply | L1 | A | A | A | A | / | / | / | / |
| | L2 | A | A | A | A | / | / | / | / |
| | Earth | A | A | A | A | / | / | / | / |
| Power Line of EUT | L1+L2 | A | A | A | A | / | / | / | / |
| | L1 + Earth | A | A | A | A | / | / | / | / |
| | L2 + Earth | A | A | A | A | / | / | / | / |
| | L1+L2+Earth | A | A | A | A | / | / | / | / |
| Telecommunication Port | | A | A | / | / | / | / | / | / |



11 - SURGE IMMUNITY TEST (IEC 61000-4-5)

11.1 Block Diagram of Test Setup



11.2 Test Standard

EN55024: 1998+A2: 2003 (EN61000-4-5: 2006 Severity Level: Line to Line, Level 2: 1KV, Line to Earth, Level 3: 2KV)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

| Severity Level | Open-Circuit Test Voltage KV |
|----------------|---------------------------------|
| 1 | 0.5 |
| 2 | 1.0 |
| 3 | 2.0 |
| 4 | 4.0 |
| * | Special |

11.3.2 Performance criterion: B

11.4 Operating Condition of EUT

11.4.1 Setup the EUT as shown in Section 11.1.

11.4.2. Turn on the power of all equipments.

11.4.3. Let the EUT work in test mode (Normal operation) and measure it.

11.5 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.1.
- 2) For AC port coupling mode, provide a 1 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.



11.6 Test Result

PASS

Please refer to the following page.

| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~24 |
| Humidity (%RH) | 50~55 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

Table 1: Surge Power Supply (AC Power Supply)

| Level | Voltage | Poll | Path | Pass | Fail |
|-------|---------|------|-----------------|------|------|
| 1 | 0.5kV | ± | L-N | A | / |
| 2 | 1kV | ± | L-N | A | / |
| 3 | 2kV | ± | L-PE, N-PE | A | / |
| 4 | 4kV | ± | L-N, L-PE, N-PE | / | / |

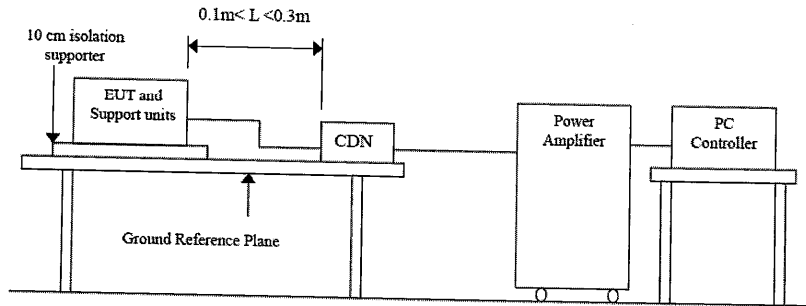
Table 2: Surge Telecommunication Port

| Level | Voltage | Poll | Path | Pass | Fail |
|-------|---------|------|----------|------|------|
| 1 | 1.0kV | ± | Line-ged | A | / |



12 - CONDUCTED SUSCEPTIBILITY TEST (IEC 61000-4-6)

12.1 Block Diagram of Test Setup



12.2 Test Standard

EN55024: 1998+A2: 2003 (EN61000-4-6: 2008, Severity Level 2: 3V (rms)).(0.15MHz ~ 80MHz)

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

| Level | Field Strength V(rms) |
|-------|-----------------------|
| 1. | 1 |
| 2. | 3 |
| 3. | 10 |
| X | Special |

12.3.2 Performance criterion: A

12.4 Operating Condition of EUT

12.4.1 Setup the EUT as shown in Section 12.1.

12.4.2 Turn on the power of all equipments.

12.4.3 Let the EUT work in test mode (Normal operation) and measure it.



12.5 Test Procedure

12.5.1 For signal lines and control lines ports:
It's unnecessary to test.

12.5.2 For AC Input line ports:

- 1) Set up the EUT, CDN and test generators as shown on Section 12.1.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling network) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.6 Test Results

PASS

Please refer to the following page.

Frequency Range (MHz): 0.15~80MHz

Modulation: Amplitude 80%, 1kHz sinewave

Severity Level: 3Vr.m.s.

| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~24 |
| Humidity (%RH) | 50~55 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

| Level | Voltage Level (e.m.f.) U_0 | Pass | Fail |
|-------|---------------------------------|------|------|
| 1 | 1 | / | / |
| 2 | 3 | A | / |
| 3 | 10 | / | / |
| X | Special | / | / |

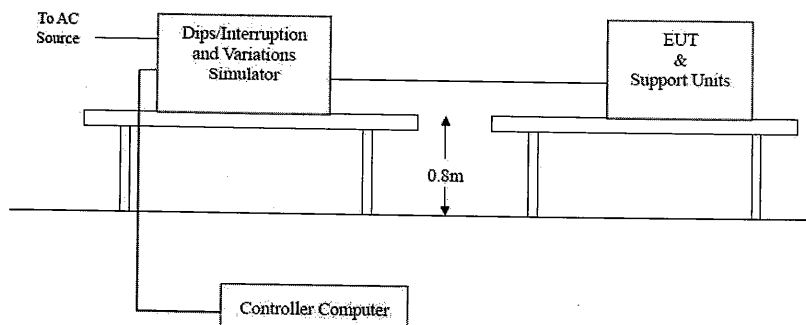
LAN Port

| Level | Voltage Level (e.m.f.) U_0 | Pass | Fail |
|-------|---------------------------------|------|------|
| 1 | 1 | / | / |
| 2 | 3 | A | / |
| 3 | 10 | / | / |
| X | Special | / | / |



13 - Voltage Dips, Short Interruptions Immunity Tests (IEC 61000-4-11)

13.1 Block Diagram of Test Setup



13.2 Test Standard

EN55024: 1998+A2: 2003, EN61000-6-2: 2005 (EN61000-4-11: 2004)

13.3 Severity Levels and Performance Criterion

13.3.1 Severity level

| Test Level %UT | Voltage dip and short interruptions %UT | Duration (in period) |
|-------------------|--|-------------------------|
| 0 | 100 | 0.5 |
| 70 | 30 | 1 |
| | | 5 |
| | | 10 |
| 0 | 100 | 25 |
| | | 50 |
| | | * |

13.3.2 Performance criterion : B&C

13.4 EUT Configuration

The configuration of EUT is listed in Section 13.1.

13.5 Operating Condition of EUT

13.5.1 Turn on the power of all equipments.

13.5.2 Let the EUT work in test mode (Normal operation) and measure it.

13.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 13.1.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.



13.7 Test Result

PASS

Please refer to the following page.

| | |
|------------------------------|----------------------------|
| Temperature (°C) | 22~24 |
| Humidity (%RH) | 50~55 |
| Barometric Pressure (mbar) | 950~1000 |
| EUT | Fingerprint Access Control |
| M/N | H2i |
| Operating Mode | Normal operation |

| Level | U2 | td | Phase Angle | N | Pass | Fail |
|-------|------|--------|--------------|---|------|------|
| 1 | >95% | 10ms | 0/90/180/270 | 3 | B | / |
| 2 | 30% | 500ms | 0/90/180/270 | 3 | C | / |
| 3 | >95% | 5000ms | 0/90/180/270 | 3 | C | / |

Note:

- A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.
- B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.
- C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.



14 - TEST RESULTS

The following tests were performed on the **FINGERTEC WORLDWIDE SDN BHD**'s product; model: **H2i**; the actual test results are contained within the Test Data section of this report.

14.1 IEC 61000-4-2 Electrostatic Discharge Immunity Test Configuration

The EUT was subjected to the electrostatic discharge tests required by EN 55024 and all lower levels specified in IEC 61000-4-2.

The EUT continued to perform as intended during and after the application of the ESD. Test setup photographs presented in Appendix C.

14.2 IEC 61000-4-3 Radiated Susceptibility Test Configuration

The EUT was subjected to a 3-volt/meter, 80% Amplitude, 1 kHz Sine wave field as required by EN 55024 and all lower levels specified in IEC 61000-4-3.

The EUT continued to perform as intended during and after the application of the electromagnetic field. Test setup photographs presented in Appendix C.

14.3 IEC 61000-4-4 Electrical Fast Transient/Burst Immunity Test Configuration

The EUT was subjected to the electrical fast transient tests required by EN 55024 and all lower levels specified in IEC 61000-4-4.

The EUT continued to perform as intended during and after the application of the EFT/B. Test setup photographs presented in Appendix C.

14.4 IEC 61000-4-5 Surge Immunity Test Configuration

The EUT was subjected to the Surge Immunity tests required by EN 55024 and all lower levels specified in IEC 61000-4-5.

The EUT continued to perform as intended during and after the application of the Surge Immunity Test. Test setup photographs presented in Appendix C.

14.5 IEC 61000-4-6 Conducted Susceptibility Test Configuration

The EUT was subjected to the Conducted Susceptibility tests required by EN 55024 and all lower levels specified in IEC 61000-4-6.

The EUT continued to perform as intended during and after the application of the Conducted Susceptibility Test. Test setup photographs presented in Appendix C.

14.6 IEC 61000-4-11 Voltage Dips, Short Interruptions Immunity Tests Configuration

The EUT was subjected to the Voltage Dips/Interruptions tests required by EN 55024 and all lower levels specified in IEC 61000-4-11.

The EUT continued to perform as intended during and after the application of the Voltage Dips/Interruptions Test. Test setup photographs presented in Appendix C.



APPENDIX A - PRODUCT LABELING

CE Marking Label Specification

Specification: Text is Black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.



Proposed Label Location on EUT

EUT Rear View/Proposed CE Marking Location





APPENDIX B - EUT PHOTOGRAPHS

EUT – Whole View



EUT – Front View



EUT – Rear View





EUT – Side View



EUT – Open View

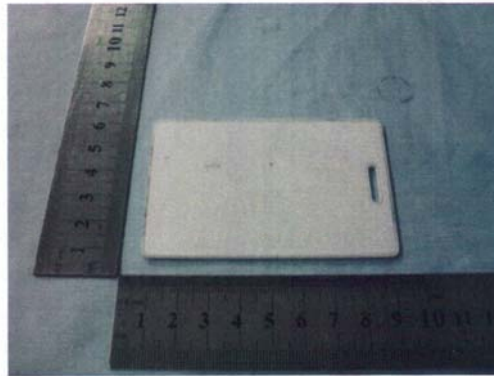


EUT – Card View

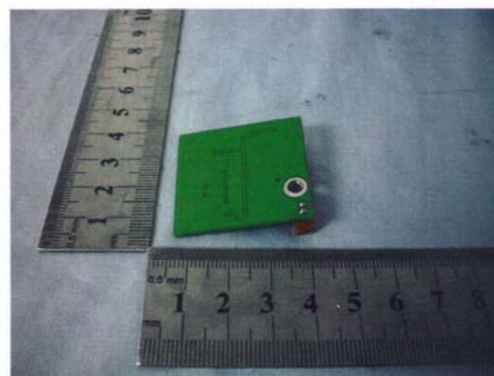
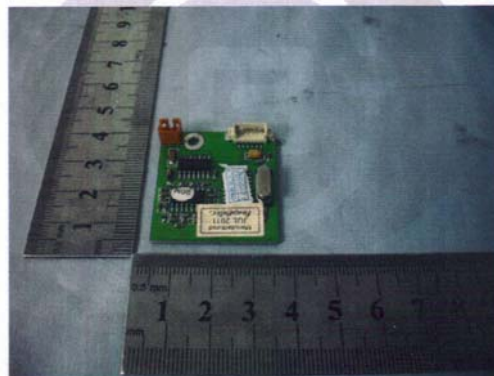




EUT – Card View

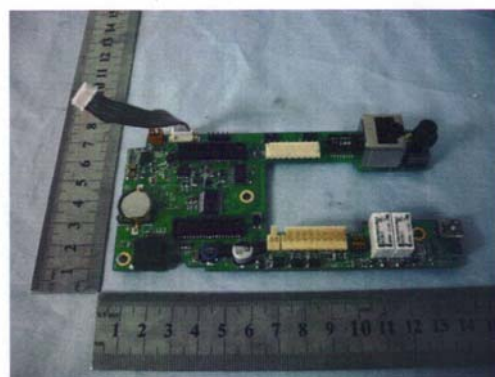
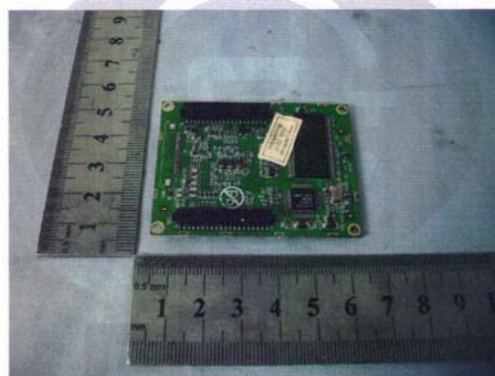
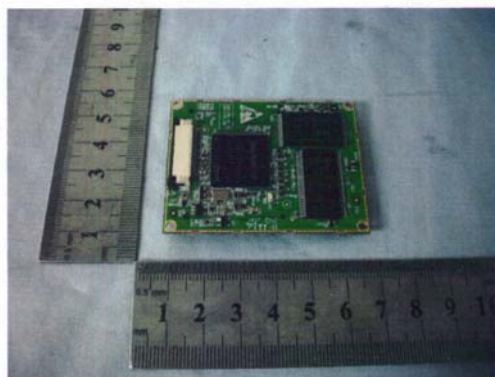


EUT – PCB View



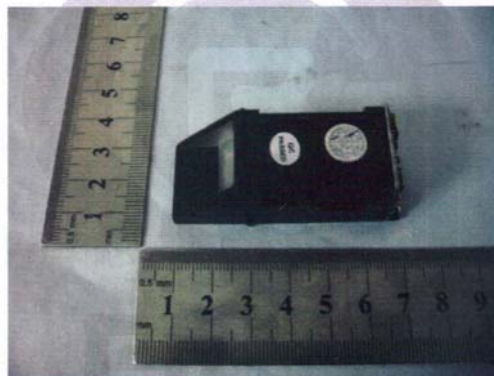
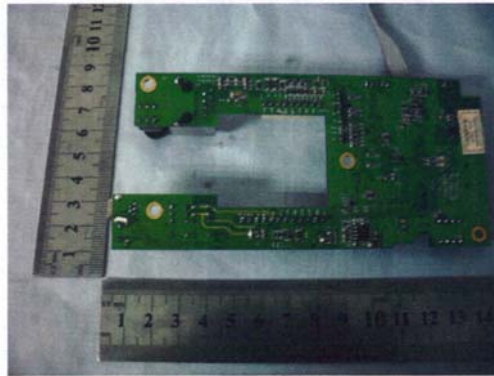


EUT – PCB View



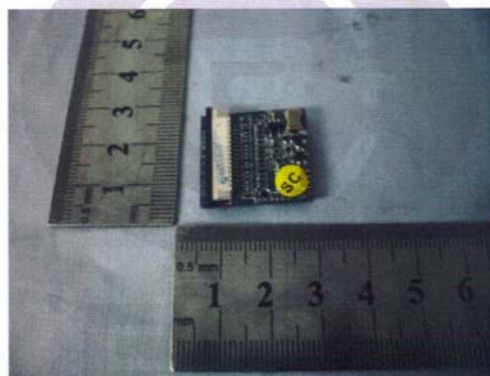
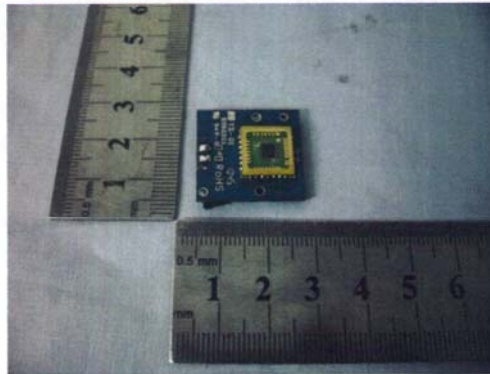


EUT – PCB View





EUT – PCB View



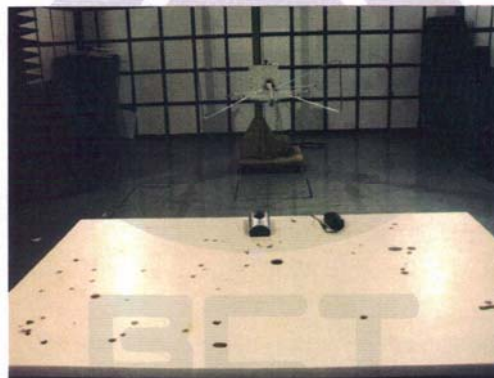


APPENDIX C - TEST SETUP PHOTOGRAPHS

Conducted Emission



Radiated Emission

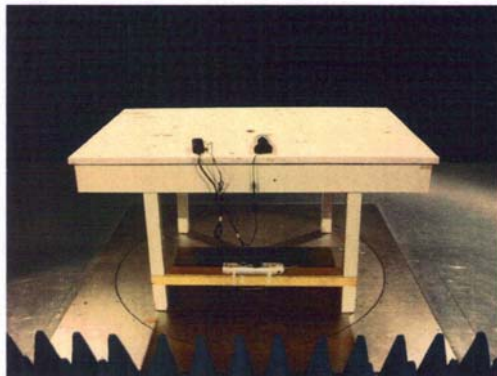


Electrostatic Discharge Immunity Test (IEC 61000-4-2)





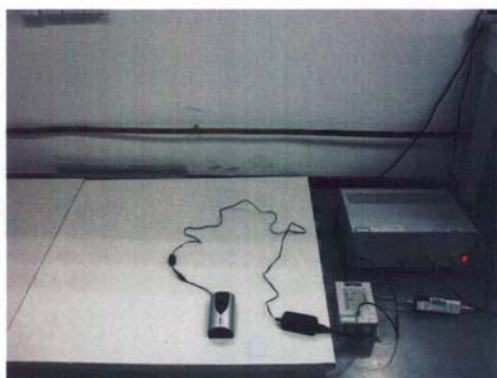
Radiated Susceptibility Test (IEC 61000-4-3)



Electrical Fast Transient/Burst Immunity Test (IEC 61000-4-4/5/11)



Conducted Susceptibility Test (IEC 61000-4-6)





APPENDIX D - BONTEK ACCREDITATION CERTIFICATES



China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L3923)

China National Accreditation Service for Conformity Assessment has accredited

Shenzhen Bontek Electronic Technology Co., Ltd.

1/F, Block East H-3, OCT Eastern Ind. Zone,

Qiaocheng East Road, Nanshan District, Shenzhen, China

to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.

Date of Issue: 2009-02-27
Date of Expiry: 2012-02-26
Date of Initial Accreditation: 2009-02-27



Signed on behalf of China National Accreditation Service
for Conformity Assessment

China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CAC) to operate the national accreditation systems for conformity assessment (CNAS) as the signatories to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC-MRA), and the signatories to Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC-MRA).



Certificate

of

Appointment

No. UA 50203122-0001

The Applicant

**Bontek Compliance Testing
Laboratory Ltd**
1/F, Block East H-3, OCT Eastern
Industrial Zone, Qiaocheng East Rd.
Nanshan, Shenzhen, Guangdong
P.R. China

has been authorized to carry out EMC tests
by order and under supervision of TÜV Rheinland according to
EN55011, EN55012, EN55013, EN55014-1, EN55014-2, EN55015, EN55020
CISPR11, CISPR12, CISPR13, CISPR14-1, CISPR14-2, CISPR15, EN55022
EN55024, EN55025, CISPR20, CISPR22, CISPR24, CISPR25
EN/IEC61000-3-2/-3, EN/IEC61000-4-2/-4/-5/-6/-8/-11
EN/IEC61547, EN/IEC62040-2, EN/IEC61000-6-1
EN/IEC61000-6-2, EN/IEC61000-6-3, EN/IEC61000-6-4
EN/IEC60601-1-2, EN/IEC61326-1, EN/IEC61326-x(x=2,3,4, or 5)

An assessment of the laboratory was conducted according to the "Procedures and
Conditions for Appointments of EMC Test Laboratories" with reference to
EN ISO/IEC 17025 by a TÜV Rheinland auditor.

Audit Report No. 17010783-002

This certificate is valid until the next scheduled audit or up to 18 months,
at the discretion of TÜV Rheinland.

Date of issue: 06.05.2011

TÜV Rheinland/CCIC (Qingdao) Co., Ltd.
18 Hong Kong Middle Road, Qingdao 266071, P.R.China
Tel: +86-532-8578-1778
Fax: +86-532-8578-1079 <http://www.chn.tuv.com>

Certification Body

Shawn Peng





Shenzhen Bontek Electronic Technology Co., Ltd.

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

March 20, 2008

Registration Number: 338263

Bontek Compliance Testing Laboratory Ltd
1/F, Block East H-3, OCT Eastern Ind. Zone,
Qiaocheng East Road, Nanshan,
Shenzhen, 518055
China

Attention: Tony Wu

Re: Measurement facility located at Hua Qiao Cheng East Ind. Area, Shenzhen, China
Anechoic chamber (3 meter)
Date of Listing: March 20, 2008

Dear Sir or Madam:

Your request for registration of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC rules. The information has, therefore, been placed on file and the name of your organization added to the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Katie Hawkins
Electronics Engineer