SGS-CSTC Standards Technical Services(Shanghai)Co., Ltd.

No. 588 West Jindu Road, Songjiang District, Shanghai, China

Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5655
Tino. Pan@sgs.com

EMC TEST REPORT

Application No.: SHEMO10050058801

Applicant: Beijing StrongLink Technology Co., Ltd.

Equipment Under Test (EUT):

NOTE: The following samples submitted were identified on behalf of the client as

EUT Name: Mifare Module
Model No.: SL025B
Serial No.: Not supplied by client

Standards: EN 55022: 2006/A1:2007
EN 55024: 1998/A1:2001/A2:2003

Date of Receipt: May 25, 2010

Date of Test: May 28, 2010

Date of Issue: May 31, 2010

Test Result :	**PASS**

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.

Jim Xu
E&E Section Head
SGS-CSTC(Shanghai) Co., Ltd.

Liky Zhu
E&E Project Engineer
SGS-CSTC(Shanghai)Co.,Ltd

2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150K to 30MHz)	EN 55022: 2006/A1:2007	EN 55022: 2006/A1:2007	CLASS B	N/A Ψ
Radiated Emission 30MHz to 1000MHz	EN 55022: 2006/A1:2007	EN 55022: 2006/A1:2007	CLASS B	PASS
ESD	EN55024: 1998/A1:2001/A2:2003	IEC 61000-4-2 :2001	Contact ±4 kV Air ±8 kV	PASS
Radio frequency electromagnetic fields,80MHz to 1GHz	EN55024: 1998/A1:2001/A2:2003	IEC 61000-4-3: 2008	3V/m 80%, 1kHz, AM	PASS
Electrical Fast Transients (EFT) on AC	EN55024: 1998/A1:2001/A2:2003	IEC 61000-4-4:2004	AC ± 1.0kV	N/A
Surges on AC	EN55024: 1998/A1:2001/A2:2003	IEC 61000-4-5 :2005	±1kV D.M.† ±2kV C.M.†	N/A
Injected Currents on AC, 150kHz to 80MHz	EN 55024 1998/A1:2001/A2:2003	IEC 61000-4-6 :2006	3Vrms (emf), 80%, 1kHz Amp. Mod.	N/A
Power-frequency magnetic field immunity test	EN55024: 1998/A1:2001/A2:2003	IEC 61000-4-8:2001	1A/m (rms), 50Hz	N/A
Voltage Dips and Interruptions on AC	EN55024: 1998/A1:2001/A2:2003	IEC 61000-4-11 :2004	>95% UT* for 0.5per 30% UT* for 25per >95% UT* for 250per	N/A

Remark:

* U_T is the nominal supply voltage.

† D.M. – Differential Mode.

† C.M. – Common Mode.

Ψ N/A –Not Applicable

.

3 Contents

4 General Information

4.1 Client Information

Applicant:	Beijing StrongLink Technology Co., Ltd.
Address of Applicant:	RM 3-105, Building A, No.170 Beiyuan Road, Chaoyang District, Beijing 100101, China
Manufacturer:	Beijing StrongLink Technology Co., Ltd.
Address of Manufacturer:	RM 3-105, Building A, No.170 Beiyuan Road, Chaoyang District, Beijing 100101, China

4.2 General Description of E.U.T

EUT Name:	Mifare Module
Model No.:	SL025B
Serial No.:	Not supplied by client

4.3 Details of E.U.T.

Power Supply:	Working Voltage:4.4-12.0VDC Current:<80mA Output Power:<250mW
Power Cord:	N/A

4.4 Description of Support Units

Name / Function	Model No.	Remark
N/A	N/A	N/A

4.5 Standards Applicable for Testing

The customer requested EMC tests for Mifare Module.

The standards used were EN 55022: 2006/A1:2007 and EN 55024: 1998/A1:2001/A2:2003.

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

Standard		Status
EN 55022: 2006/A1:2007	Conducted Emissions on AC	×
EN 55022: 2006/A1:2007	Radiated Emission 30MHz to 1000MHz	√

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

Table 2: Tests carried out under EN 55024: 1998/A1:2001/A2:2003

Standard		Status
IEC 61000-4-2 :2001	Electrostatic discharge test	√
IEC 61000-4-3: 2008	Radio frequency electromagnetic fields test	√
IEC 61000-4-4:2004	Electrical fast transients/burst test	×
IEC 61000-4-5 :2005	Surges test	×
IEC 61000-4-6 :2006	Injected Currents test	×
IEC 61000-4-8 :2001	Power-frequency magnetic field immunity test	×
IEC 61000-4-11 :2004	Voltage dips and interruptions test	×

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

Note: The EUT does not contain any component which is susceptible from the magnetic field.

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Monitoring of EUT for All Immunity Test

Visual:

4.9 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

4.10 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 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. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

5 Equipments Used during Test

Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2009-06-04	2010-06-03
2	Antenna	SCHWARZBECK	VULB9168	9168-313	2009-06-04	2010-06-03
3	CONTROLLER	INNCO	CO200	474	/	/

Electrostatic Discharge Test

Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal. Due date
1	Electrostatic Discharge Simulator	KIKUSUI	KES4021	LL004261	2010-04-25	2011-04-24

Radio frequency electromagnetic fields Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2009-10-09	2010-10-08
2	amplifier	AR	30W1000B	0327284	--	--
3	amplifier	AR	30S1G3	0324978	--	--
4	power meter	Rohde & Schwarz	NRP	101641	2010-05-05	2011-05-04
5	Single generator	Rohde & Schwarz	SMR40	100555	2009-06-04	2010-06-03

General Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2003P	/	2009-10-15	2010-10-14
2	Digital Multimeter	FLUKE	17B	10560713	2009-09-16	2010-09-15
3	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2009-10-21	2010-10-20
4	Digital illuminance meter	TES electrical electronic Corp.	TES-1330A	050602219	2009-10-16	2010-10-15

6 Emission Test Results

6.1 Radiated Emissions (30MHz to 1GHz)

Test Requirement:	EN55022:2006
Test Method:	EN55022:2006
Test Date:	May 28, 2010
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Limit:	40.0 dBμV/m between 30MHz to 230MHz
	47.0 dBμV/m between 230MHz to 1GHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
	Quasi-Peak if maximised peak within 6dB of limit

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 21.0°C Humidity: 55% RH Atmospheric Pressure: 1012 mbar

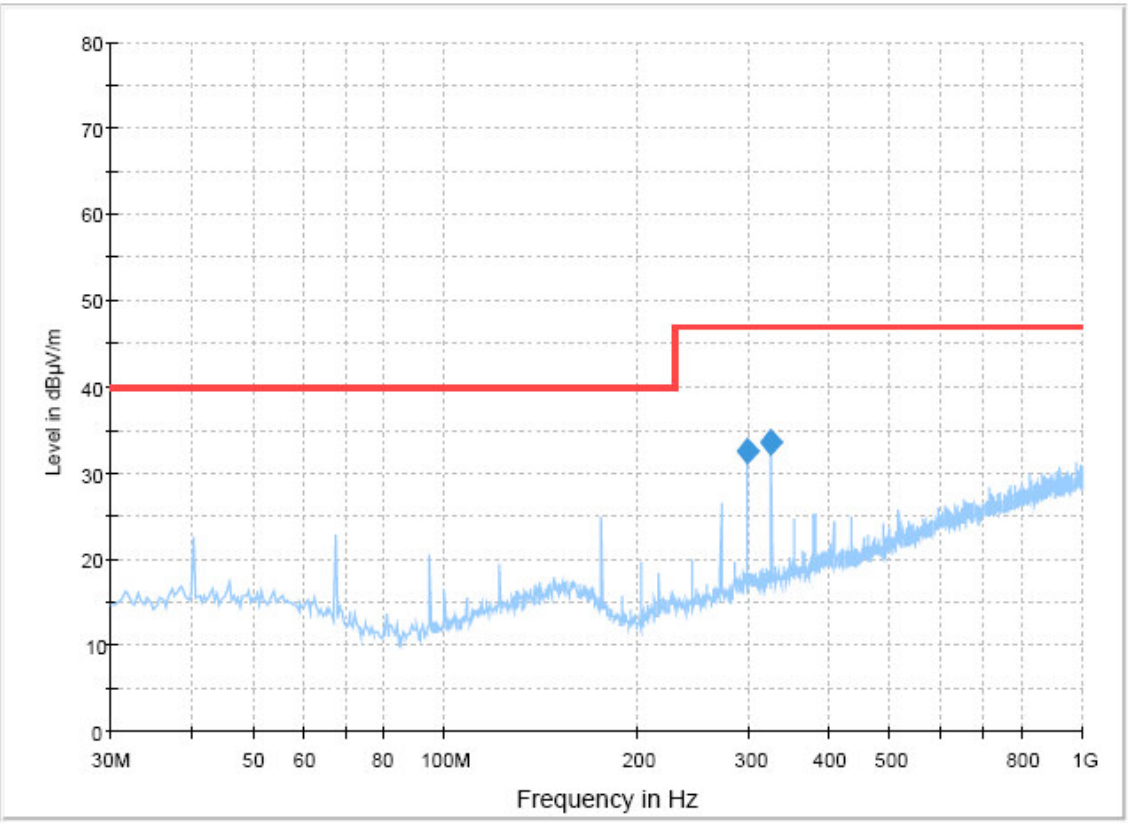
EUT Operation: Test EUT is in representative work

6.1.2 Test Result and Partial Measurement Data

Pass

An initial pre-scan was performed in the SAC using the receiver in peak detection mode. The EUT was measured peak emissions from the EUT were detected within 6dB of the class B limit line.

Horizontal :



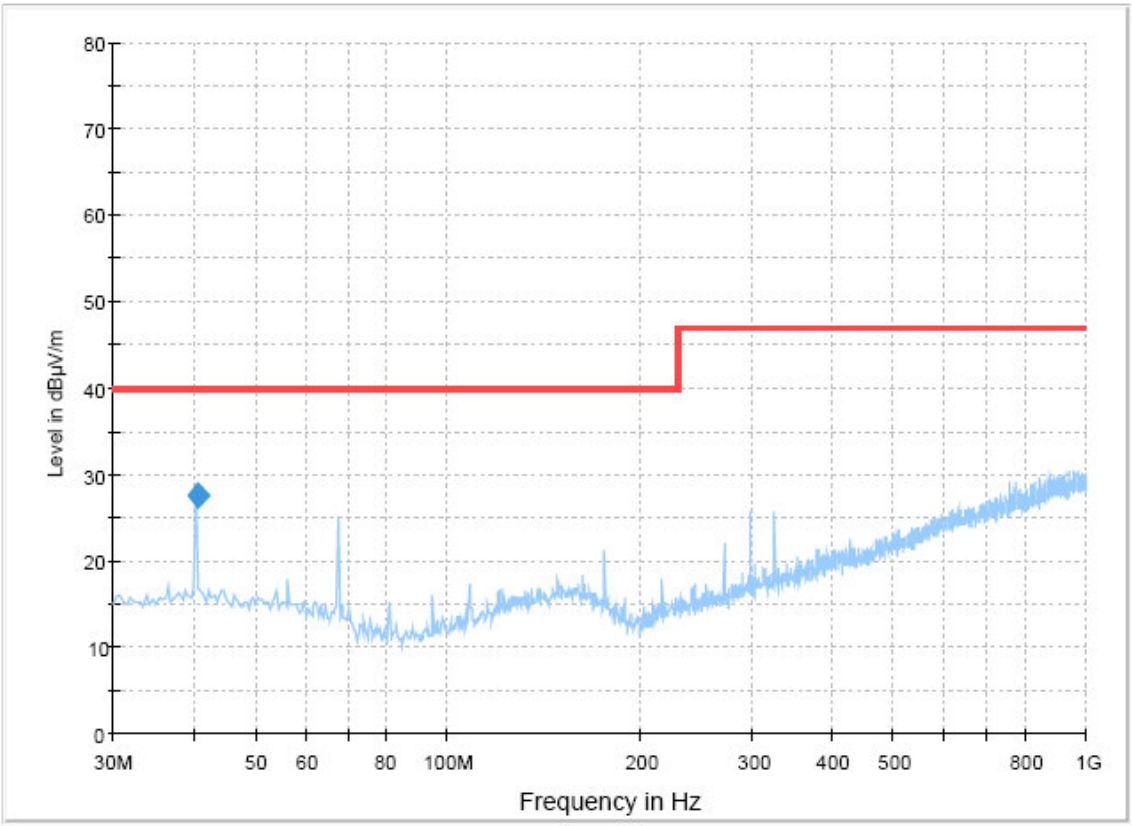
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
298.358560	32.5	1000.000	120.000	100.0	H	138.0	-7.6	14.50
325.483200	33.6	1000.000	120.000	100.0	H	160.0	-7.0	13.40

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dBµV/m)	Comment
298.358560	47.00	
325.483200	47.00	

Vertical :



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
40.689120	27.6	1000.000	120.000	100.0	V	192.0	-8.9	12.40

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dBµV/m)	Comment
40.689120	40.00	

7 Immunity Test Results

7.1 Performance Criteria Description in Clause 7 of EN55024

Performance Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

7.2 ESD

Test Requirement:	EN55024:1998/A1:2001/A2:2003	
Test Method:	IEC 61000-4-2: 2001	
Test Date:	May 28, 2010	
Discharge Impedance:	330 Ω / 150 pF	
Discharge Voltage:	Air Discharge:	±8 kV
	Contact Discharge:	±4 kV
	HCP:	±4 kV
	VCP:	±4 kV
Polarity:	Positive & Negative	
Number of Discharge:	Minimum 50 times at each test point for Contact and VCP Discharge;Minimum 10 times at each test point for Air Discharge	
Discharge Mode:	Single Discharge	
Discharge Period:	1 second minimum	

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 20.0 °C Humidity: 42% RH Atmospheric Pressure: 1004 mbar

EUT Operation: Test EUT is the in representative work.

7.2.2 Direct Application Test Results

Observations: Test Point:

1. All insulated enclosure & seams around EUT.
2. All touchable metal material of EUT

Direct Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Points**	**Contact Discharge**	**Air Discharge**
8	+/-	1	N/A	B
4	+/-	2	B	N/A

Indirect Application Test Results

Observations: Test Point: 1. All sides.

Indirect Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Point**	**Horizontal Coupling**	**Vertical Coupling**
4	+/-	1	B	B

Results:

N/A: Not applicable (not required in the standard or floor moutned the EUT)

7.3 Radio Frequency Electromagnetic Fields Test (80MHz to 1GHz)

Test Requirement: EN55024:1998/A1:2001/A2:2003

Test Method: IEC 61000-4-3: 2008

Test Date: May 28, 2010

Frequency Range: 80MHz to 1GHz

Test level: 3V/m on enclosure

Modulation: 80%, 1kHz Amplitude Modulation

Criteria: Performance criteria A

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.0°C Humidity: 55% RH Atmospheric Pressure: 1015 mbar

EUT Operation: Test EUT is the in representative work.

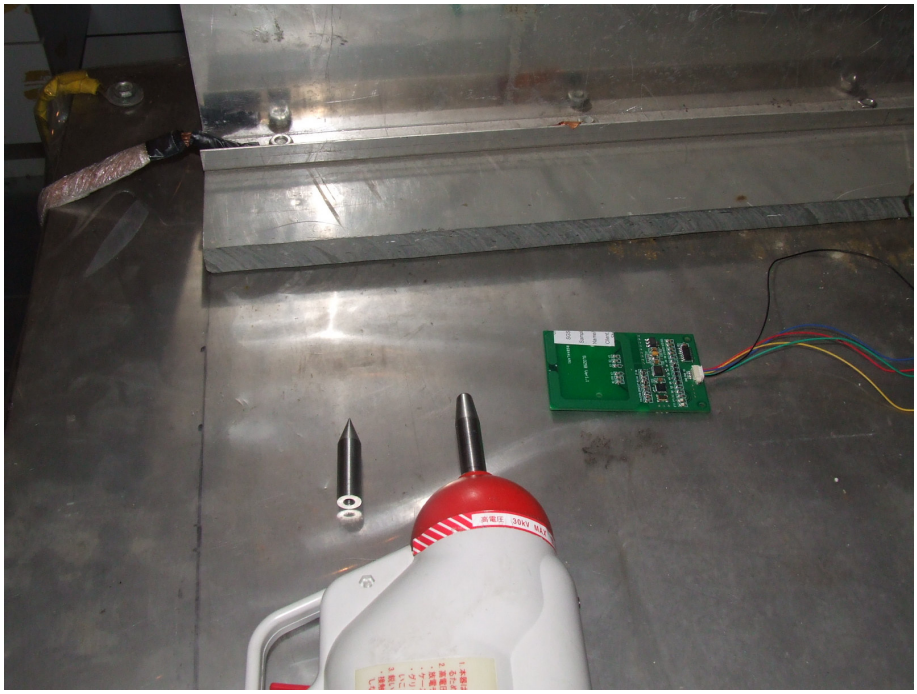
7.3.2 Test Results

Pass

8 Photographs

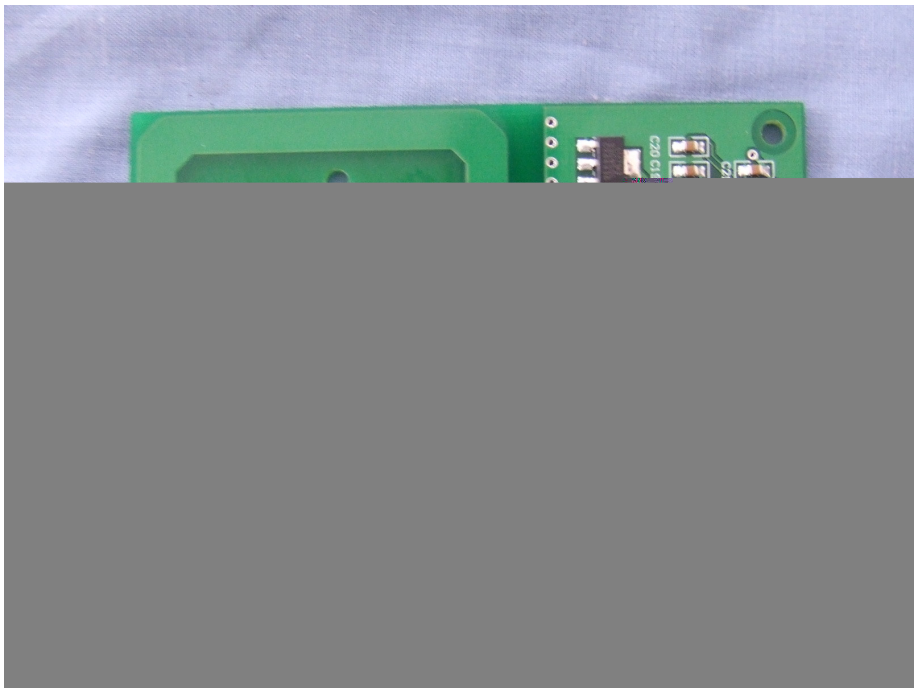
8.1 Radiated Emission Test Setup

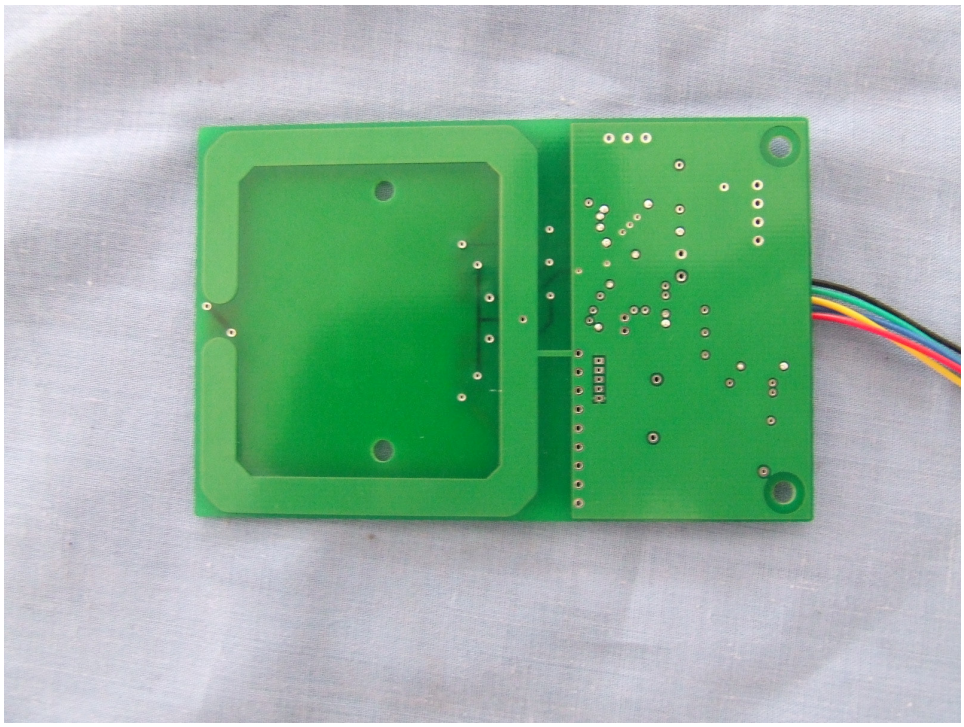
8.2 ESD Test Setup



8.3 Radio Frequency Electromagnetic Fields Test Setup

8.4 EUT Constructional Details





THE END OF REPORT