

# VERIFICATION OF COMPLIANCE

● **Equipment** : PHOTOELECTRIC SENSOR SERIES  
**Model No.** : DXX-XXXXX(X=0-9,A-Z,a-z,blank,/ or -) \  
LC-XXXXXX(X=0-9,A-Z,a-z,blank,/ or -) \  
MXX-XXXXX(X=0-9,A-Z,a-z,blank,/ or -) \  
TR-XXXXX(X=0-9,A-Z,a-z,blank,/ or -)  
**Applicant** : DARICH TECHNOLOGY CO., LTD.  
No.180, Dalian 3rd St., Taoyuan Dist.,  
Taoyuan City 330, Taiwan (R.O.C.)



I HEREBY

DECLARE THAT :

The equipment is in accordance with the procedures are given in EUROPEAN COUNCIL DIRECTIVE 2014/30/EU. The equipment was **Passed** the test performed according to European Standard EN 61000-6-3:2007/A1:2011, EN 61000-3-2:2014, EN 61000-3-3:2013 and EN 61000-6-1:2007 (IEC 61000-4-2 Edition 2.0 2008-12, IEC 61000-4-3 Edition 3.2 2010-04, IEC 61000-4-4 Edition 3.0 2012-04, IEC 61000-4-5 Edition 3.0 2014-05, IEC 61000-4-6 Edition 4.0 2013-10, IEC 61000-4-8 Edition 2.0 2009-09, IEC 61000-4-11 Edition 2.0 2004-03).

The test was carried out on Apr. 18, 2016 at SPORTON INTERNATIONAL INC. LAB.

A handwritten signature in black ink, appearing to read 'Kero Kuo', written over a horizontal line.

**Kero Kuo**  
Assistant Manager



# CE EMC TEST REPORT

according to

**European Standard EN 61000-6-3:2007/A1:2011,  
EN 61000-3-2:2014, EN 61000-3-3:2013 and  
EN 61000-6-1:2007 (IEC 61000-4-2 Edition 2.0 2008-12,  
IEC 61000-4-3 Edition 3.2 2010-04, IEC 61000-4-4 Edition 3.0 2012-04,  
IEC 61000-4-5 Edition 3.0 2014-05, IEC 61000-4-6 Edition 4.0 2013-10,  
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Applicant : **DARICH TECHNOLOGY CO., LTD.**  
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## Statement

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
- This test report is only applicable to European Community.

***SPORTON International Inc.***

*No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan, R.O.C.*



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**Appendix A. TEST PHOTOS**

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# VERIFICATION OF COMPLIANCE

according to

**European Standard EN 61000-6-3:2007/A1:2011,  
EN 61000-3-2:2014, EN 61000-3-3:2013 and  
EN 61000-6-1:2007 (IEC 61000-4-2 Edition 2.0 2008-12,  
IEC 61000-4-3 Edition 3.2 2010-04, IEC 61000-4-4 Edition 3.0 2012-04,  
IEC 61000-4-5 Edition 3.0 2014-05, IEC 61000-4-6 Edition 4.0 2013-10,  
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The sample received on Apr. 12, 2016 and completely tested on **Apr. 18, 2016** at **SPORTON LAB International Inc. LAB.**

**Kero Kuo / Assistant Manager**

**SPORTON International Inc.**

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan, R.O.C.



# VERIFICATION OF COMPLIANCE

according to

**European Standard EN 61000-6-3:2007/A1:2011,  
EN 61000-3-2:2014, EN 61000-3-3:2013 and  
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IEC 61000-4-3 Edition 3.2 2010-04, IEC 61000-4-4 Edition 3.0 2012-04,  
IEC 61000-4-5 Edition 3.0 2014-05, IEC 61000-4-6 Edition 4.0 2013-10,  
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\_\_\_\_\_  
Kero Kuo / Assistant Manager

**SPORTON International Inc.**

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan, R.O.C.



## 1. General Description of Equipment under Test

### 1.1. Applicant

DARICH TECHNOLOGY CO., LTD.  
No.180, Dalian 3rd St., Taoyuan Dist.,  
Taoyuan City 330, Taiwan (R.O.C.)

### 1.2. Manufacturer

Same as 1.1

### 1.3. Basic Description of Equipment under Test

Equipment : PHOTOELECTRIC SENSOR SERIES  
Model No. : DXX-XXXXXX(X=0-9,A-Z,a-z,blank,/ or -) \  
LC-XXXXXX(X=0-9,A-Z,a-z,blank,/ or -) \  
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TR-XXXXXX(X=0-9,A-Z,a-z,blank,/ or -)  
Trade Name : DRH  
Power Supply Type : From DC 24V  
DC Cable : Non-Shielded, 2.0 m, 3 pin

### 1.4. Feature of Equipment under Test

Please refer to user manual.



## 2. Test Configuration of Equipment under Test

### 2.1. Test Manner

- a. The EUT has been associated with personal computer and peripherals pursuant to European Standard EN 61000-6-3 and EN 61000-6-1.
- b. The equipment under test were performed the following test modes:

Test Items	Description of test modes
<b>Radiated Emissions</b>	Mode 1. DC 24V
<b>EMS</b>	Mode 1. DC 24V

- c. Frequency range investigated: Radiation 30 MHz to 1,000 MHz.
- d. Frequency range investigated immunity test: CS 150 kHz to 80 MHz, RS 80 MHz to 2,700 MHz.



## 2.2. Description of Test System

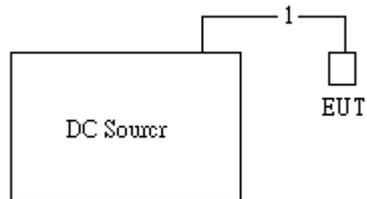
< For radiated emission below 1GHz >

No.	Peripheral	Manufacturer	Model Number	Cable / Spec. Description
<b>For Local</b>				
1	DC Source	Chroma	62050P-100-100	-

< EMS >

No.	Peripheral	Manufacturer	Model Number	Cable / Spec. Description
<b>For Local</b>				
1	DC Source	Twintex	TPS-6015	-

### 2.3. Connection Diagram of Test System for Radiated Emission



1. The power cables is connected from the EUT to the support unit 1.



### **3. Test Software**

The EUT operates continuous induction (LED lights).



## 4. General Information of Test

### 4.1. Test Facility

**<EMI>**

**Test Site : SPORTON INTERNATIONAL INC.**

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District,  
Taoyuan City, Taiwan, R.O.C.

TEL : 886-3-327-3456

FAX : 886-3-327-0973

Test Site No. : 10CH02-HY

**<EMS>**

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District,  
Taoyuan City, Taiwan, R.O.C.

TEL : 886-3-327-3456

FAX : 886-3-327-0973

### 4.2. Test Voltage

DC 24V

### 4.3. Measurement Procedure

EMI Test : European Standard EN 61000-6-3

Harmonics Test : European Standard EN 61000-3-2

Voltage Fluctuations Test : European Standard EN 61000-3-3

EMS Test : European Standard EN 61000-6-1

(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,

CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

### 4.4. Test in Compliance with

EMI Test : European Standard EN 61000-6-3

Harmonics Test : European Standard EN 61000-3-2

Voltage Fluctuations Test : European Standard EN 61000-3-3

EMS Test : European Standard EN 61000-6-1

(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,

CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

### 4.5. Frequency Range Investigated

a. Radiated emission test: from 30 MHz to 1,000 MHz

b. Radio frequency electromagnetic field immunity test: 80-2700 MHz

### 4.6. Test Distance

a. The test distance of radiated emission test from antenna to EUT is 10 M.

b. The test distance of radio frequency electromagnetic field immunity test from antenna to EUT is 3 M.



## **5. Conducted Emissions Measurement**

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 61000-6-3. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meter above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

### **5.1. Test Procedures**

- a. The EUT was warmed up for 15 minutes before testing started.
- b. The EUT was placed on a desk 0.8 meter height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meter from any other grounded conducting surface.
- c. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- d. Connect Telecommunication port to ISN (Impedance Stabilization Network).
- e. All the support units are connect to the other LISN.
- f. The LISN provides 50 ohm, coupling impedance for the measuring instrument.
- g. The CISPR states that a 50 ohm, 50 microhenry LISN should be used.
- h. Both sides of AC line were checked for maximum conducted interference.
- i. The frequency range from 150 kHz to 30 MHz was searched.
- j. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



## **5.2. Typical Test Setup Layout of DC Powerline Conducted Emissions**

- a. AMN is 80 cm from the EUT and at least 80 cm from other units and other metal planes.
- b. EUT is connected to one artificial mains network (AMN).
- c. All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.
- d. Rear of EUT to be flushed with rear of table top.
- e. Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.
- f. If cables, which hang closer than 40 cm to the horizontal metal ground plane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
- g. Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.
- h. Cables of hand operated devices, such as keyboards, mice, etc. shall be placed as for normal usage.

## **5.3. Typical Test Setup Layout of Disturbance at Telecommunication Ports**

- a. AMN and ISN are 80 cm from the EUT and at least 80 cm from other units and other metal planes.
- b. EUT is connected to one artificial mains network (AMN).
- c. All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.
- d. Rear of EUT to be flushed with rear of table top.
- e. Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.
- f. If cables, which hang closer than 40 cm to the horizontal metal ground plane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
- g. Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.
- h. Cables of hand operated devices, such as keyboards, mice, etc. shall be placed as for normal usage.



#### **5.4. Test Result of AC Powerline Conducted Emission**

The power supply of this EUT is DC voltage.

Conduction Powerline tests is not applicable for this EUT.



## **5.5. Test Result of Disturbance at Telecommunication Ports**

The EUT does not have the communication port.



## **6. Radiated Emission Measurement**

Radiated emissions from 30 MHz to 1,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in European Standard EN 61000-6-3. The EUT was placed on a nonmetallic stand, 0.8 meter above the ground plane. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

### **6.1. Test Procedures**

#### **For Below 1GHz**

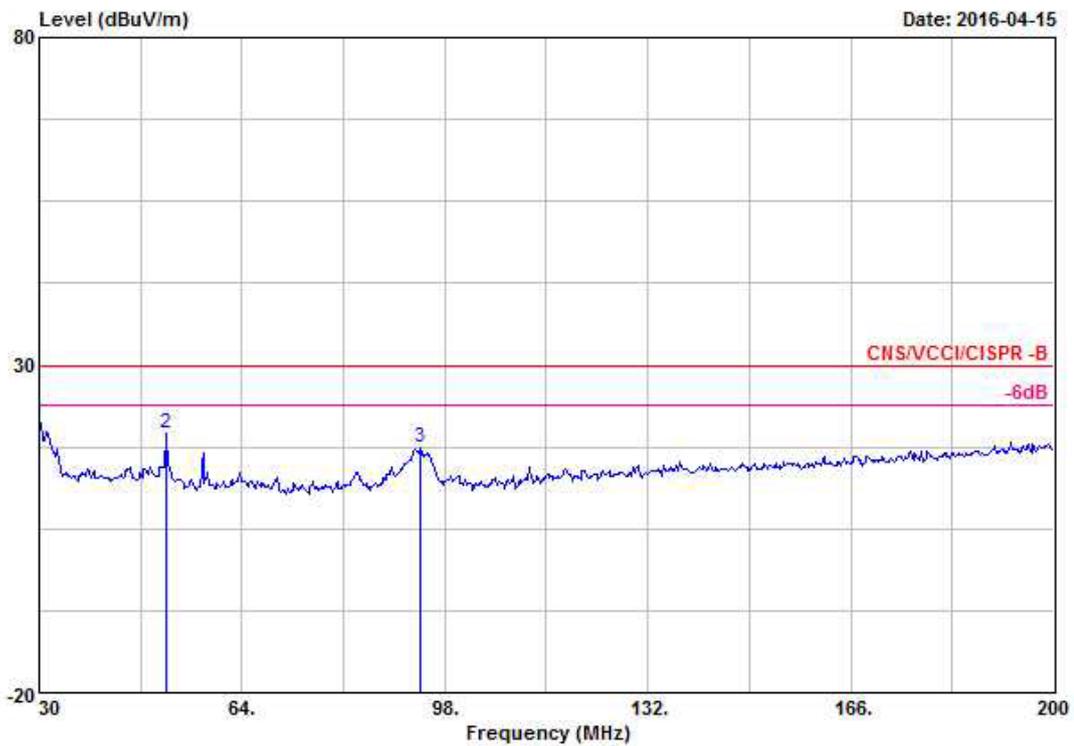
- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 10 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.



6.2. Test Result of Radiated Emission for Below 1GHz

Test mode	Mode 1	Test Site No.	10CH02-HY
Test frequency	30 MHz ~ 1000 MHz	Test Engineer	Nicky
Temperature	22 °C	Relative Humidity	64 %
Note: 1. Emission level (dBμV/m) = 20 log Emission level (μV/m)			
2. Corrected Reading : Antenna Factor + Cable Loss + Read Level – Preamp Factor = Level			
■ The test was passed at the minimum margin that marked by the frame in the following data			

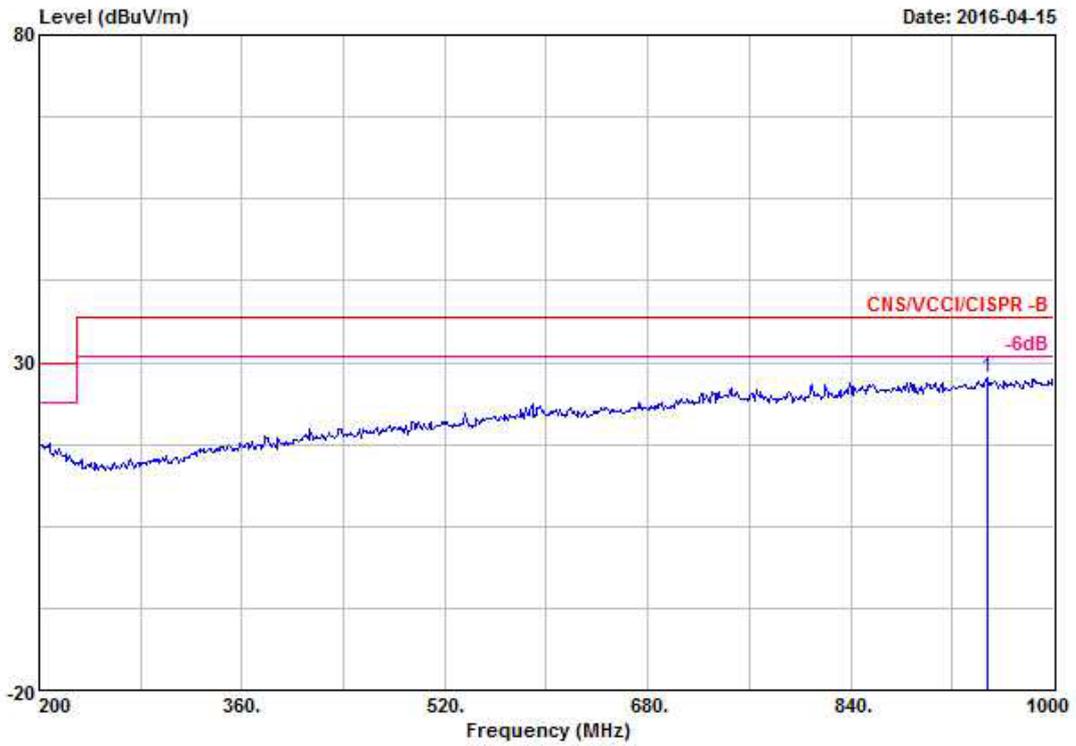
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	30.000	21.50	-8.50	30.00	33.49	28.26	1.60	14.67	Peak	100	40
2	51.420	19.50	-10.50	30.00	35.96	28.22	2.05	9.71	Peak	---	---
3	93.750	17.43	-12.57	30.00	33.43	28.08	2.82	9.26	Peak	---	---



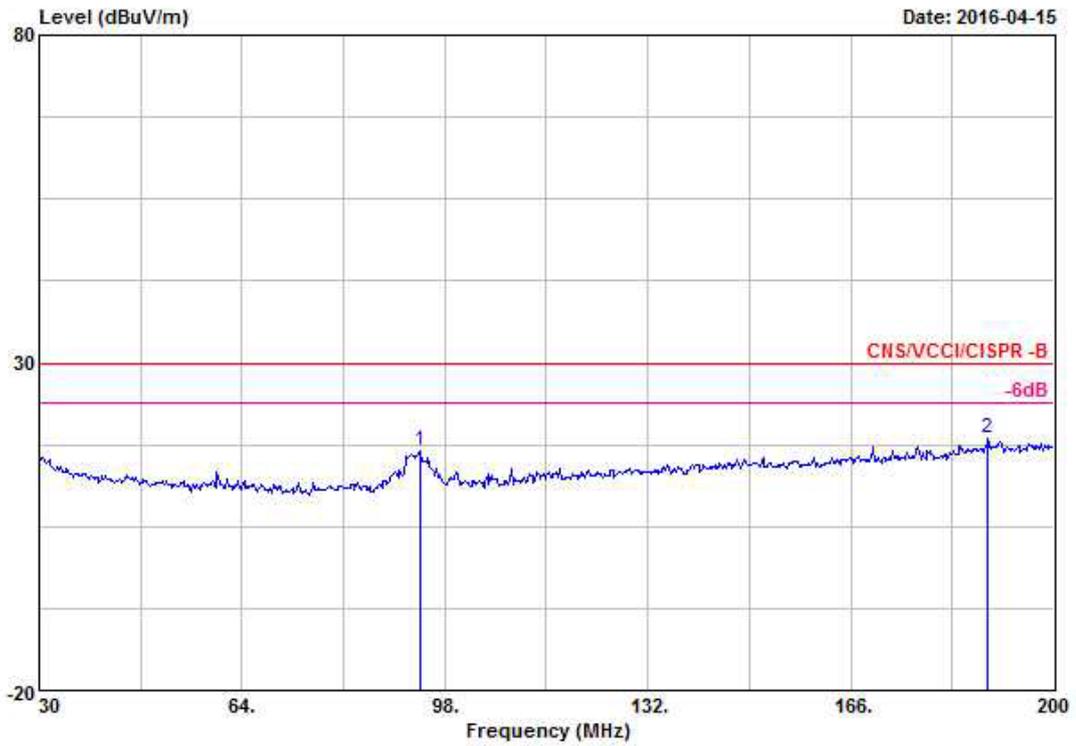
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	947.200	27.59	-9.41	37.00	26.13	27.47	6.95	21.98	Peak	---	---



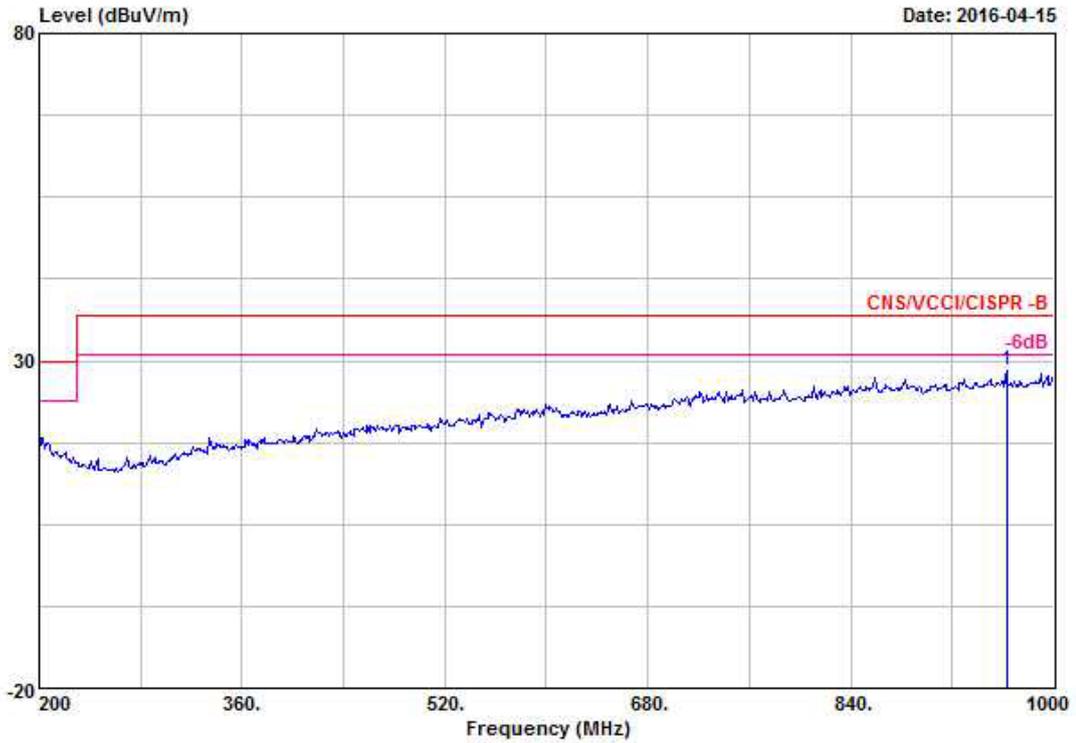
**Horizontal**



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	93.750	16.61	-13.39	30.00	32.61	28.08	2.82	9.26	Peak	---	---
2	188.950	18.38	-11.62	30.00	28.12	27.63	4.03	13.86	Peak	---	---



**Horizontal**



1 #	Freq MHz	Level dBuV/m	Over Limit dB	Limit Line dBuV/m	Read Level dBuV	Preamp Factor dB	CableAntenna Loss Factor dB	dB/m	Remark	Ant Pos cm	Table Pos deg
1 #	963.200	28.49	-8.51	37.00	26.82	27.41	6.98	22.10	Peak	---	---

## 7. Harmonic Current Emissions Measurement

### 7.1. Standard

- Standard : EN 61000-3-2

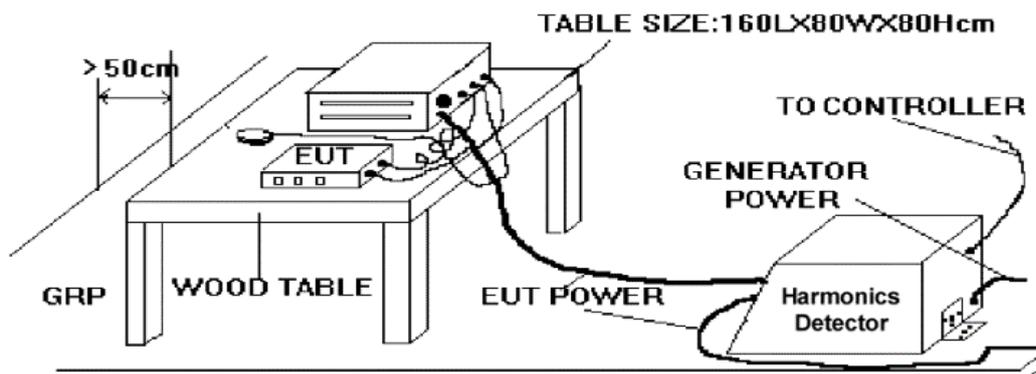
### 7.2. Test Procedure

The measured values of the harmonics components of the input current, including line current and neutral current, shall be compared with the limits given in Clause 7 of EN 61000-3-2.

### 7.3. Test Equipment Settings

Harmonic Parameters	Setting
Line Voltage	230 V
Line Frequency	50 Hz
Device Class	-
Current Measurement Range	High
Measurement Delay	10.0 seconds
Test Duration	10.0 minutes
Class determination Pre-test Duration	10.0 seconds

### 7.4. Typical Test Setup Layout of Harmonic Current Emissions





## **7.5. Test Result of Harmonic Current Emissions**

The power supply of this EUT is DC voltage.  
Harmonics tests are not applicable for this EUT.

## 8. Voltage Fluctuations and Flicker Measurement

### 8.1. Standard

- Product Standard : EN 61000-3-3

### 8.2. Test Procedure

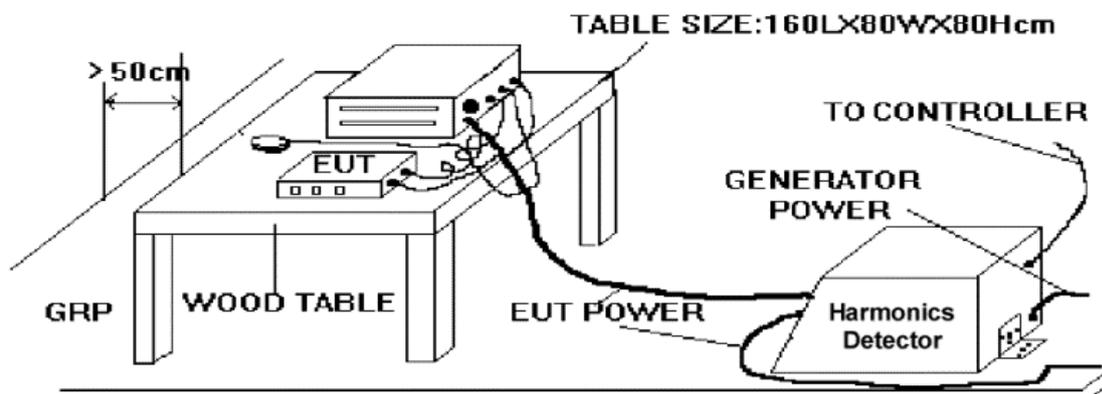
The equipment shall be tested under the conditions of **Clause 5**.

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of  $\pm 8\%$  is achieved during the whole assessment procedure.

### 8.3. Test Equipment Settings

Flicker Parameters	Setting
Line Voltage	230 V
Line Frequency	50 Hz
Measurement Delay	10.0 seconds
Pst Integration Time	10.0 minutes
Pst Integration Periods	1
Test Duration	10.0 minutes

### 8.4. Typical Test Setup Layout of Voltage Fluctuations and Flicker





## **8.5. Test Result of Voltage Fluctuation and Flicker**

The power supply of this EUT is DC voltage.

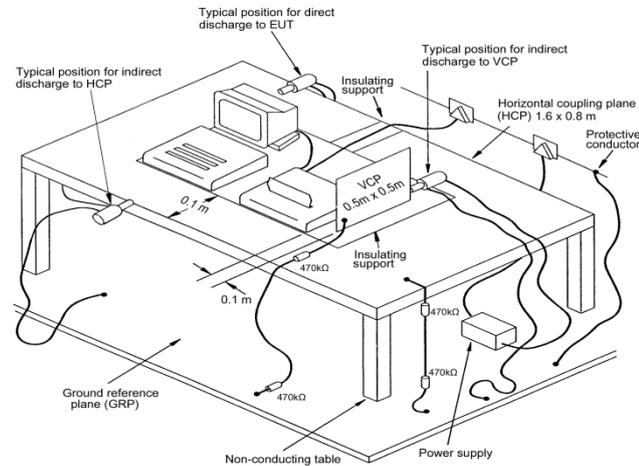
Voltage Fluctuations tests is not applicable for this EUT.



## 9. Electrostatic Discharge Immunity Measurement (ESD)

Test mode	Mode 1
Final Test Result	<b>PASS</b>
Pass Performance Criteria	<b>A</b> $\pm 2 / \pm 4 / \pm 8$ kV for air discharge
	<b>A</b> $\pm 2 / \pm 4$ kV for contact discharge
Required Performance Criteria	<b>B</b> $\pm 2 / \pm 4 / \pm 8$ kV for air discharge
	<b>B</b> $\pm 2 / \pm 4$ kV for contact discharge
Basic Standard	IEC 61000-4-2
Product Standard	EN 61000-6-1:2007
Level	3 for air discharge
	2 for contact discharge
Test Voltage	$\pm 2 / \pm 4 / \pm 8$ kV for air discharge
	$\pm 2 / \pm 4$ kV for contact discharge
Discharge Impedance	330 ohm / 150 pF
Temperature	23 °C
Relative Humidity	41 %
Atmospheric Pressure	101 kPa
Test Date	Apr. 18, 2016
Test Engineer	Easton
Observation	The test points, please refer to section 9.5.

## 9.1. Test Setup



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the following manner:

- a. CONTACT DISCHARGE to the conductive surfaces and to coupling plane;
- b. AIR DISCHARGE at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.



## **9.2. Test Setup for Tests Performed in Laboratory**

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the SPORTON EMC LAB., we provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1 m minimum was provided between the EUT and the wall of the Lab., and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2 m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resistor located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8 m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.



### **9.3.ESD Test Procedure**

- a. In the case of air discharge testing the climatic conditions shall be within the following ranges:
  - ambient temperature: 15 °C to 35 °C;
  - relative humidity : 30 % to 60 %;
  - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar).
- b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.
- c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.
- d. The test shall be performed with both air discharge and contact discharge. On preselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on air discharge. On preselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on contact discharge.
- e. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.
- f. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.
- g. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted:
  - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
  - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
  - The contact discharge test shall not be applied to such surfaces.
- h. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.



### 9.4. Test Severity Levels

#### 9.4.1. Contact Discharge

Level	Test Voltage (kV) of Contact discharge
1	±2
2	±4
3	±6
4	±8
X	Specified

Remark : "X" is an open level.

#### 9.4.2. Air Discharge

Level	Test Voltage (kV) of Air Discharge
1	±2
2	±4
3	±8
4	±15
X	Specified

Remark : "X" is an open level.



## 9.5. Test Points

### 9.5.1. Test Result of Air Discharge

Test Point	No. of Discharges	Air Discharge/Round Tip						Test Record
		+2kV	-2kV	+4kV	-4kV	+8kV	-8kV	
CASE	10	A	A	A	A	A	A	Normal
LED	10	A	A	A	A	A	A	Normal
Control Button	10	A	A	A	A	A	A	Normal
DC Input Jack	10	A	A	A	A	A	A	Normal

### 9.5.2. Test Result of Contact Discharge

#### Direct discharge

Test Points	No. of Discharges	Contact Discharge/Round Tip				Test Record
		+2kV	-2kV	+4kV	-4kV	
SCREW Ring	25	A	A	A	A	Normal

#### Indirect discharge to HCP and VCP

Test Point	No. of Discharges	Contact Discharge/Pointed Tip				Test Record
		+2kV	-2kV	+4kV	-4kV	
HCP (At Front)	10	A	A	A	A	Normal
HCP (At Left)	10	A	A	A	A	Normal
HCP (At Right)	10	A	A	A	A	Normal
HCP (At Rear)	10	A	A	A	A	Normal
VCP (At Front)	10	A	A	A	A	Normal
VCP (At Left)	10	A	A	A	A	Normal
VCP (At Right)	10	A	A	A	A	Normal
VCP (At Rear)	10	A	A	A	A	Normal

**10. Radio Frequency Electromagnetic Field Immunity Measurement (RS)**

<b>Test mode</b>	Mode 1
<b>Final Test Result</b>	<b>PASS</b>
<b>Pass Performance Criteria</b>	A
<b>Required Performance Criteria</b>	A
<b>Basic Standard</b>	IEC 61000-4-3
<b>Product Standard</b>	EN 61000-6-1:2007
<b>Level</b>	1 / 2 / 2
<b>Frequency Range</b>	80-1000 MHz, 1400-2700 MHz
<b>Field Strength</b>	3 V/m (unmodulated, r.m.s) 80% AM (1 kHz) – for 80-1000 MHz 3 V/m (unmodulated, r.m.s) 80% AM (1 kHz) – for 1400-2000 MHz 1 V/m (unmodulated, r.m.s) 80% AM (1 kHz) – for 2000-2700 MHz
<b>Temperature</b>	23 °C
<b>Relative Humidity</b>	41 %
<b>Atmospheric Pressure</b>	101 kPa
<b>Test Date</b>	Apr. 18, 2016
<b>Test Engineer</b>	Easton



### 10.1. Test Record

Frequency Band: 80-1000 MHz

Sides of the EUT have been exposed to the field	Antenna positioned	Test field strength Level	Test field strength (V/m)	Test Record
Front	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)
Left	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)
Back	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)
Right	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)

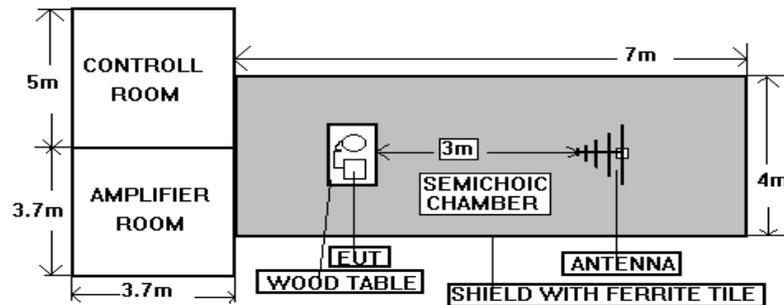
1400-2000 MHz

Sides of the EUT have been exposed to the field	Antenna positioned	Test field strength Level	Test field strength (V/m)	Test Record
Front	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)
Left	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)
Back	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)
Right	Vertical	2	3	Normal (No influencing)
	Horizontally	2	3	Normal (No influencing)

2000-2700 MHz

Sides of the EUT have been exposed to the field	Antenna positioned	Test field strength Level	Test field strength (V/m)	Test Record
Front	Vertical	1	1	Normal (No influencing)
	Horizontally	1	1	Normal (No influencing)
Left	Vertical	1	1	Normal (No influencing)
	Horizontally	1	1	Normal (No influencing)
Back	Vertical	1	1	Normal (No influencing)
	Horizontally	1	1	Normal (No influencing)
Right	Vertical	1	1	Normal (No influencing)
	Horizontally	1	1	Normal (No influencing)

## 10.2. Test Setup



**NOTE :** The SPORTON 7m x 4m x 4m semi-anechoic chamber is compliance with the sixteen point's uniform field requirement as stated in IEC 61000-4-3 Section 6.2.

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.



**10.3. Test Procedure**

- a. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.
- b. The bilog antenna which is enabling the complete frequency range of 80-1000MHz, 1400-2700MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.
- c. The test is normally performed with the generating antenna facing each of four sides of the EUT. The polarization of the field generated by the broadband (bilog) antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.
- d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency(ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
- e. At each of the above conditions, the frequency range is swept 80-1000MHz, 1400-2700MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of  $1.5 \cdot 10^{-3}$  decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

**10.4. Test Severity Levels**

Frequency Band : 80-1000MHz, 1400-2700MHz

Level	Test field strength (V/m)
1	1
2	3
3	10
X	Specified

Remark : "X" is an open class.



### 11. Electrical Fast Transient/Burst Immunity Measurement (EFT/BURST)

Test mode	Mode 1
Final Test Result	<b>PASS</b>
Pass Performance Criteria	A
Required Performance Criteria	B
Basic Standard	IEC 61000-4-4
Product Standard	EN 61000-6-1:2007
Level	on DC input power ports – 1
Test Voltage	on DC input power ports -- $\pm 0.5$ kV
Impulse wave shape	5/50 ns (Tr/Th)
Impulse frequency	5 kHz
Test Repetition Rate	1 time / minute
Temperature	23 °C
Relative Humidity	41 %
Atmospheric Pressure	101 kPa
Test Date	Apr. 18, 2016
Test Engineer	Easton

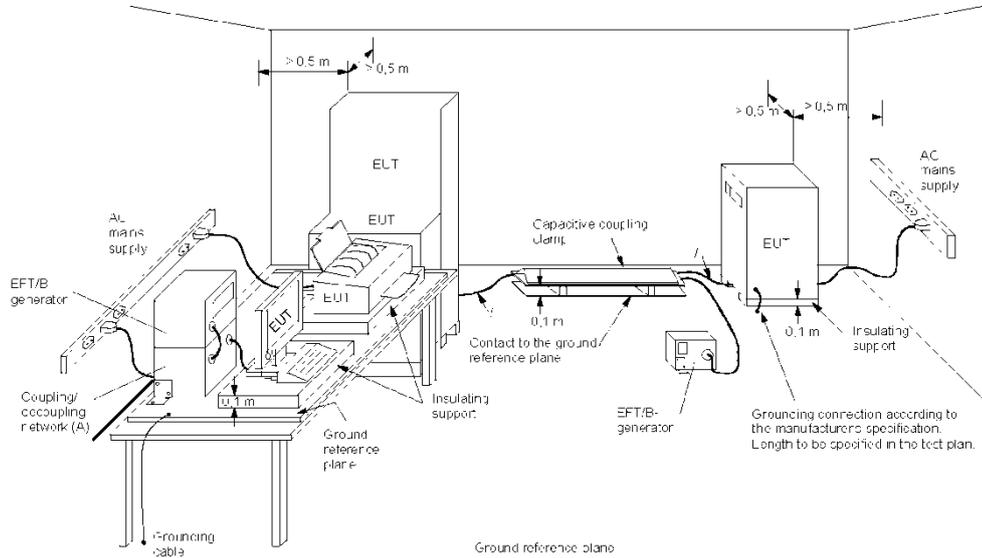
#### 11.1. Test Record

■ on DC Input power ports:

Test Location	Polarity	Test Level	Voltage (Peak)	Test Record
+ / -	+	1	0.5 kV	Normal (No influencing)
	-	1	0.5 kV	Normal (No influencing)

Remark : PE = Earth reference

## 11.2. Test setup



IEC 901/04

### Key

- f length between clamp and the EUT to be tested (should be  $0.5\text{ m} \pm 0.05\text{ m}$ )
- (A) location for supply line coupling
- (B) location for signal lines coupling

The EUT was placed on a ground reference plane and was insulated from it by an insulating support about 0.1 m thick. If the EUT is table-top equipment, it was located approximately 0.8 m above the GRP. The GRP was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. It shall project beyond the EUT by at least 0.1 m on all sides and connected to the protective earth. In the SPORTON EMC LAB., We provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system. The EUT was arranged and connected according to its functional requirements. The minimum distance between the EUT and other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. using the coupling clamp, the minimum distance between the coupling plates and all other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. The length of the signal and power lines between the coupling device and the EUT was 1 m or less.



### **11.3. Test on Power Line**

- a. The EFT/B-generator was located on the GRP. The length from the EFT/B-generator to the EUT as not exceeds 1 m.
- b. The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.

### **11.4. Test on Communication Lines**

- a. The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP.
- b. The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.

### **11.5. Test Procedure**

- a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
  - ambient temperature: 15 °C to 35 °C;
  - relative humidity : 45 % to 75 %;
  - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar).
- b. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.
- c. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.
- d. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :
  - Normal performance within the specification limits.
  - Temporary degradation or loss of function or performance which is self-recoverable.
  - Temporary degradation or loss of function or performance which requires operator intervention or system reset.
  - Degradation or loss of function which is not recoverable due to damage of equipment (components).



### 11.6. Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test :

Open circuit output test voltage $\pm 10\%$		
Level	On Input power ports	On signal port and telecommunication ports
1	0.5 kV	0.25 kV
2	1.0 kV	0.50 kV
3	2.0 kV	1.00 kV
4	4.0 kV	2.00 kV
X	Specified	Specified

Remark : " X " is an open level.  
The level is subject to negotiation between the user and the manufacturer or is specified by the manufacturer.



## **12. Surge Immunity Measurement**

The power supply is From DC Source.

Surge Immunity tests is not applicable for this EUT.



### 13. Conducted Disturbances Induced by Radio-Frequency Field Immunity Measurement (CS)

Test mode	Mode 1
Final Test Result	<b>PASS</b>
Pass Performance Criteria	A
Required Performance Criteria	A
Basic Standard	IEC 61000-4-6
Product Standard	EN 61000-6-1:2007
Level	2
Test Voltage	3 V (unmodulated, r.m.s), 80% AM (1 kHz)
Frequency Range	0.15 MHz to 80 MHz
Test Port	on DC Input Power Port
Dwell time	2.9 seconds
Frequency step size	1 %
Coupling mode	CDN M016 M2 for DC Input Power Port
Temperature	23 °C
Relative Humidity	41 %
Atmospheric Pressure	101 kPa
Test Date	Apr. 18, 2016
Test Engineer	Easton

#### 13.1. Test Record

Test Port	Test field strength level	Test field strength (V rms)	Test Record
DC Input power port	2	3	Normal (No influencing)



**13.2. Test Severity Levels**

Level	Voltage Level (EMF)
1	1 V rms
2	3 V rms
3	10 V rms
x	Specified

Remark : " X " is an open level.  
This level can be specified in the product specification.

**13.3. Operating Condition**

Full system

**13.4. Test Procedure**

- a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
- b. This test method test can be performed without using a sell shielded enclosure. This is because the disturbance levels applied and the geometry of the setups are not likely to radiated a high amount of energy, especially at the lower frequencies. If under certain circumstances the radiated energy is too high, a shielded enclosure has to be used.
- c. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
- d. The frequency range is swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
- e. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency(ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
- f. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.
- g. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.
- h. The use of special exercising programs is recommended.
- i. Testing shall be performed according to a Test Plan, which shall be included in the test report.



- j. It may be necessary to carry out some investigatory testing in order to establish some aspects of the test plan.

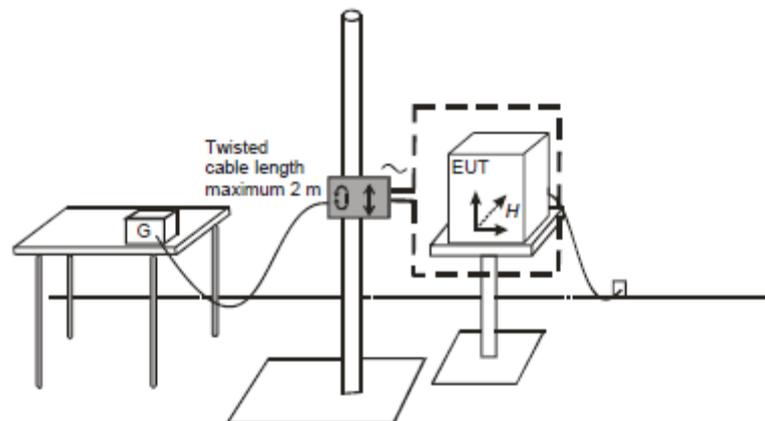
## 14. Power Frequency Magnetic Field immunity Measurement (PFMF)

<b>Test mode</b>	Mode 1
<b>Final Test Result</b>	<b>PASS</b>
<b>Pass Performance Criteria</b>	A
<b>Required Performance Criteria</b>	A
<b>Basic Standard</b>	IEC 61000-4-8
<b>Product Standard</b>	EN 61000-6-1:2007
<b>Temperature</b>	23 °C
<b>Relative Humidity</b>	41 %
<b>Atmospheric Pressure</b>	101 kPa
<b>Test Date</b>	Apr. 18, 2016
<b>Test Engineer</b>	Easton
<b>Observation</b>	Please refer to section 14.1

### 14.1. Test Record

Power Frequency Magnetic Field	Testing duration	Coil Orientation	Test Record
50/60Hz, 3A/m	1.0 Min	X-axis	Normal (No influencing)
50/60Hz, 3A/m	1.0 Min	Y-axis	Normal (No influencing)
50/60Hz, 3A/m	1.0 Min	Z-axis	Normal (No influencing)

### 14.2. Test Setup



EUT : Equipment under test    G : Test Generator



## **15. Voltage Dips and Voltage Interruptions Immunity Measurement (DIP)**

The power supply is From DC Source.

DIP Immunity tests is not applicable for this EUT.



## 16. List of Measuring Equipment Used

### Radiation Emission Below 1GHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
10m Semi Anechoic Chamber	TDK	SAC-10M	10CH02-HY	30 MHz ~ 1 GHz 10m,3m	Oct. 13, 2015	Radiation (10CH02-HY)
Amplifier	AGILENT	8447D	2944A10828	100 KHz ~ 1.3 GHz	Feb. 15, 2016	Radiation (10CH02-HY)
Amplifier	AGILENT	8447D	2944A10827	100 KHz ~ 1.3 GHz	Jan. 27, 2016	Radiation (10CH02-HY)
Receiver	R&S	ESI	838496/008	20 Hz ~ 7 GHz	Sep. 01, 2015	Radiation (10CH02-HY)
Receiver	KEYSIGNT	N9038A	MY54130031	20 Hz ~ 8.4 GHz	Apr. 14, 2016	Radiation (10CH02-HY)
Biconical Antenna	Schwarzbeck	VHBB 9124	287	30 MHz ~ 200 MHz	Aug. 01, 2015	Radiation (10CH02-HY)
Log Antenna	Schwarzbeck	VUSLP 9111	207	200 MHz ~ 1 GHz	Aug. 01, 2015	Radiation (10CH02-HY)
Turn Table	EM Electronics	EM 1000	060546	0 -360 degree	NCR	Radiation (10CH02-HY)
Antenna Mast	HD	MA240	240/664	1 m - 4 m	NCR	Radiation (10CH02-HY)
Antenna Mast	HD	MA240	240/667	1 m - 4 m	NCR	Radiation (10CH02-HY)
RF Cable-R10m	Jye Bao	RG142	CB027-INSIDE	30 MHz ~ 1 GHz	Jan. 01, 2016	Radiation (10CH02-HY)
RF Cable-R10m	MTJ	RG223/U + RG8/U	CB026-DOOR	30 MHz ~ 1 GHz	Jan. 01, 2016	Radiation (10CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

NCR: NO CALIBRATION REQUEST.



**EMS**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
ESD Simulator	KEYTEK	MZ-15/EC	0302234	Air: 0 ~15kV Contact: 0 ~ 8kV	Oct. 26, 2015	ESD
RS immunity Test system	ROHDE& SCHWARZ	RSF	RS-01	80M~3GHz	Apr. 21, 2015	RS
Amplifier	AMPLIFIER& RESEARCH	250W 1000AM	0332909	80MHz ~ 1GHz	Mar. 16, 2016	RS
Amplifier	AMPLIFIER& RESEARCH	30S1G3	312505	800M~3GHz	Oct. 14, 2015	RS
DUAL DIRECTIONAL COUPLER	AMPLIFIER& RESEARCH	DC6180A	312453	0.08 ~ 1GHz	Oct. 14, 2015	RS
DUAL DIRECTIONAL COUPLER	AMPLIFIER& RESEARCH	DC7144A	312782	0.8 ~ 4.2GHz	Oct. 14, 2015	RS
INTEGRATED MEASUREMENT SYSTEM	ROHDE& SCHWARZ	IMS	100007	9kHz ~ 3GHz	May 08, 2015	RS
NRP-Z91 POWER SENSOR 6GHZ	ROHDE& SCHWARZ	NRP-Z91 1168.8004.02	100095	9kHz ~ 3GHz	May 08, 2015	RS
Antenna	FRANKONIA	BTA-L	02002L	26MHz ~ 1GHz	May 05, 2015	RS
Antenna	AR	AT4002A	312601	800MHz ~ 5GHz	May 05, 2015	RS
Probe	ETS-LINDGREN	HI-6005	00052473	0.1MHz ~ 5GHz	Nov. 18, 2015	RS
EFT Generator	TESEQ	FTM3425	0180	0 ~ 4kV	Jan. 18, 2016	EFT
Conducted Immunity Test System	TESEQ	NSG4070	34293	9kHz ~ 1GHz	Aug. 23, 2015	CS
Attenuator	BIRD	100-SA-MFB-06	0232	150kHz ~ 230MHz	Aug. 25, 2015	CS
Coupling/Decoupling Network	SCHAFFNER	CDN M016	16676	150kHz ~ 230MHz	Jul. 03, 2015	CS
Magnetic field Immunity Loop	FCC (KEYTEK)	F-1000-4-8-G-125A	05004	30A//CONTINUOUS 100A/2Hrs 230A/30SEC	Dec. 30, 2015	PFMF
Magnetic Generator	FCC (KEYTEK)	F-1000-4-8/9/10-L-1M	03004	30A//CONTINUOUS 100A/2Hrs 230A/30SEC	Dec. 30, 2015	PFMF

Note: Calibration Interval of instruments listed above is one year.



## 17. Uncertainty of Test Site

### Emission Test Measurement Uncertainty

Test Items	Test Site No.	Uncertainty	Remark
Radiated Emissions below 1GHz	10CH02-HY	± 2.8dB	Confidence levels of 95%

### Immunity Test Measurement Uncertainty

#### ◆ ESD Immunity (IEC 61000-4-2)

#### Negative Discharge Current

From Standard			
2kV	First Peak Current	Current at 30ns	Current at 60ns
Nominal	7.5	4	2
Min	6.75	2.8	1.4
Max	8.25	5.2	2.6
Tolerance in %	10%	30%	30%

From calibration certificate					
Measured First Peak Current	1st Peak Worst case. +5%	Measured Current at 30ns	30ns Worst case. +5%	Measured Current at 60ns	60ns Worst case. -5%
7.48	7.85	4.2	4.41	2.01	2.11
	6.75		2.8		1.4
	8.25		5.2		2.6

From Standard			
4kV	First Peak Current	Current at 30ns	Current at 60ns
Nominal	15	8	4
Min	13.5	5.6	2.8
Max	16.5	10.4	5.2
Tolerance in %	10%	30%	30%

First Peak Current	1st Peak Worst case. +5%	Measured Current at 30ns	30ns Worst case. +5%	Measured Current at 60ns	60ns Worst case. +5%
15.12	15.88	8.03	8.43	3.68	3.86
	13.5		5.6		2.8
	16.5		10.4		5.2

From Standard			
6kV	First Peak Current	Current at 30ns	Current at 60ns
Nominal	22.5	12	6
Min	20.25	8.4	4.2
Max	24.75	15.6	7.8
Tolerance in %	10%	30%	30%

First Peak Current	1st Peak Worst case. -5%	Measured Current at 30ns	30ns Worst case. +5%	Measured Current at 60ns	60ns Worst case. +5%
22.78	23.92	12.37	12.99	5.45	5.72
	20.25		8.4		4.2
	24.75		15.6		7.8



**Negative Discharge Current**

From Standard			
8kV	First Peak Current	Current at 30ns	Current at 60ns
Nominal	30	16	8
Min	27	11.2	5.6
Max	33	20.8	10.4
Tolerance in %	10%	30%	30%

From calibration Certificate					
First Peak Current	1st Peak Worst case. +5%	Measured Current at 30ns	30ns Worst case. +5%	Measured Current at 60ns	60ns Worst case. +5%
30.26	31.77	16.13	16.94	7.39	7.76
	27		11.2		5.6
	33		20.8		10.4

**Negative Discharge Voltage**

Standard Parameters			
Indicated Voltage.	Tolerance.	Max.	Min.
kV	%	kV	kV
2	10	2.20	1.80
4	10	4.40	3.60
6	10	6.60	5.40
8	10	8.80	7.20
15	10	16.50	13.50

Measured Values
kV
2.05
4.027
5.955
7.916
14.839

**Negative Rise Time**

Standard Parameters	
T max.	1ns
T min	0.7ns

Measured Values			
Indicated Voltage.	Measured Rise Time.	Worst Case max. +6%	Worst Case min. -6%
2kV	0.851	0.902	0.799
4kV	0.780	0.827	0.733
6kV	0.750	0.795	0.705
8kV	0.772	0.818	0.726

**It has been demonstrated that the ESD generator meets the specified requirements in the standard with at least a 95% confidence**



◆ **RF Radiated Immunity (IEC 61000-4-3)**

Symbol	Source of Uncertainty	Value	Probability distribution	Divisor	$u_i(y)$
$F_{SM}$	Felds Strength monitor	1.5	Normal 2	2.000	0.75
$FS_{AW}$	Field Strength acceptability window	0.50	Rectangular	1.732	0.29
PAH	Power Amplifier Harmonics	0.50	Rectangular	1.732	0.29
$R_S$	Measurement System Repeatability	0.50	normal 1	1.000	0.50
$R_{EUT}$	Repeatability of EUT	0.00	normal 1	1.000	0.00
$u_c(F_S)$	Combined Standard Uncertainty	-	normal	-	0.83
$U(F_S)$	<b>Expanded Uncertainty</b>	-	<b>normal k= 2</b>		<b>1.66</b>

Specified Level (V/m)	Test level (V/m)
For 1 Volts	1.25
For 3 Volts	3.33
For 10 Volts	11.22

◆ **EFT/BURST Immunity (IEC 61000-4-4)**

**Voltage Output**

Standard Parameters				Measured Values
Indicated Voltage.	Tolerance.	Max.	Min.	
kV	%	kV	kV	kV
0.5	10	0.55	0.45	0.489
1	10	1.1	0.9	1.006
2	10	2.2	1.8	2.016
4	10	4.4	3.6	3.830
- 0.5	10	- 0.55	- 0.45	- 0.489
- 1	10	- 1.1	- 0.9	- 0.972
- 2	10	- 2.2	- 1.8	- 1.961
- 4	10	- 4.4	- 3.6	- 3.770



**Spike frequency**

Standard Parameters					Measured Values
Indicated Voltage.		Tolerance.	Max.	Min.	
kV	kHz	%	kHz	kHz	kHz
0.5	5	10	5.5	4.5	5.00
1	5	10	5.5	4.5	4.98
2	5	10	5.5	4.5	4.98
4	2.5	10	2.75	2.25	2.49
4	5	10	5.5	4.5	5.01

**Burst width**

Standard Parameters					Measured Values
Indicated Voltage.		Tolerance.	Max.	Min.	
kV	ms	%	ms	ms	ms
0.5	15	20	18	12	14.97
1	15	20	18	12	14.94
2	15	20	18	12	14.91
4	15	20	18	12	14.95

**Burst period**

Standard Parameters					Measured Values
Indicated Voltage.		Tolerance.	Max.	Min.	
kV	ms	%	ms	ms	ms
0.5	300	20	360	240	299.7
1	300	20	360	240	300.5
2	300	20	360	240	299.2
4	300	20	360	240	300.2

**It has been demonstrated that the EFT/BURST generator meets the specified requirements in the standard with at least a 95% confidence**



**◆ RF Conducted Immunity (IEC 61000-4-6)**

Symbol	Source of Uncertainty	Value	Probability distribution	Divisor	$u_i(y)$
$S_A$	Spectrum Analyzer	1.50	Rectangular	1.732	0.87
$C_C$	Current coil Calibration	1.00	normal 2	2.000	0.50
$M$	Mismatch	-0.5	U-shaped	1.414	-0.35
$M$	Mismatch	-0.3	U-shaped	1.414	-0.35
$R_S$	Measurement System Repeatability	0.50	normal 1	1.000	0.50
$R_{EUT}$	Repeatability of EUT	0.00	normal 1	1.000	0.00
$u_c(F_S)$	Combined Standard Uncertainty	-	normal	-	1.57
$U(F_S)$	<b>Expanded Uncertainty</b>	-	<b>normal k= 2</b>		<b>3.14</b>

Specified Level (V)	Test level (V)
For 1 Volts	1.30
For 3 Volts	3.88
For 10 Volts	12.15

**◆ Magnetic Field Immunity (IEC 61000-4-8)**

**Current output**

Standard Parameters					Measured Values	
Magnetic Field Strength	Output Current	Tolerance.	Max.	Min.		
A/m	A	%	A	A		
1	6	5	6.3	3.8		A
3	50	5	52.5	47.5		6.1
10	180	5	189	171	49.0	
					188.0	

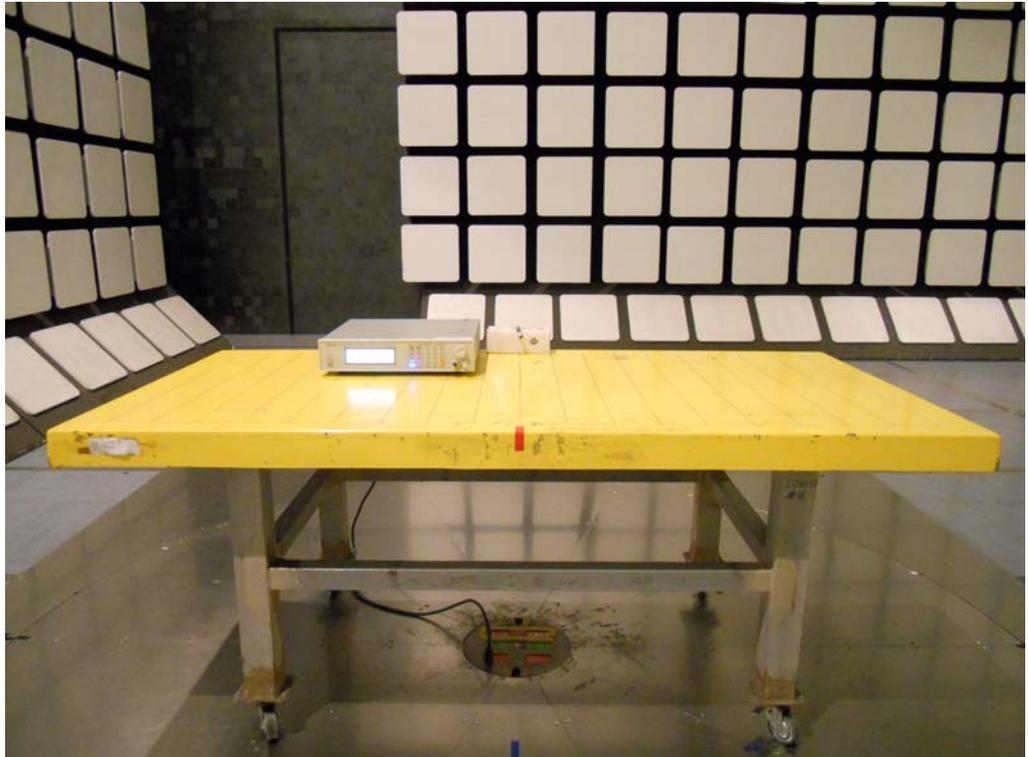
**It has been demonstrated that the Magnetic generator meets the specified requirements in the standard with at least a 95% confidence**

## Appendix A. Test Photos

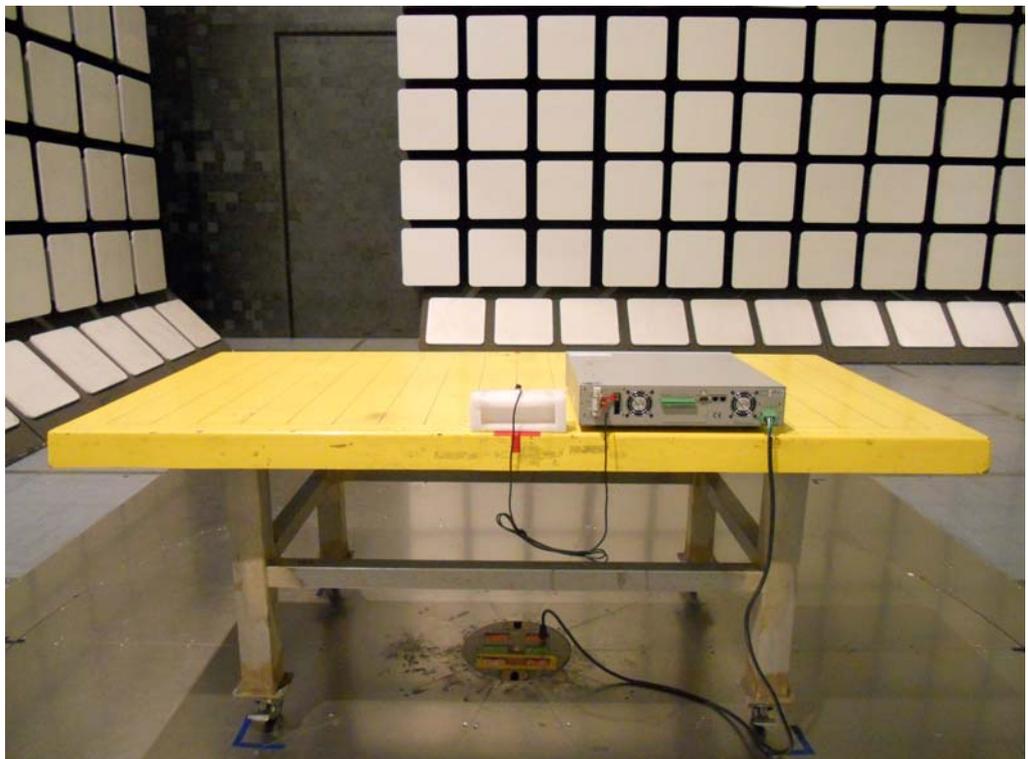
### 1. Photographs of Radiated Emissions Test Configuration

For radiated emissions below 1GHz

Front view



Rear view



## 2. Photographs of ESD Immunity Test Configuration

Front view



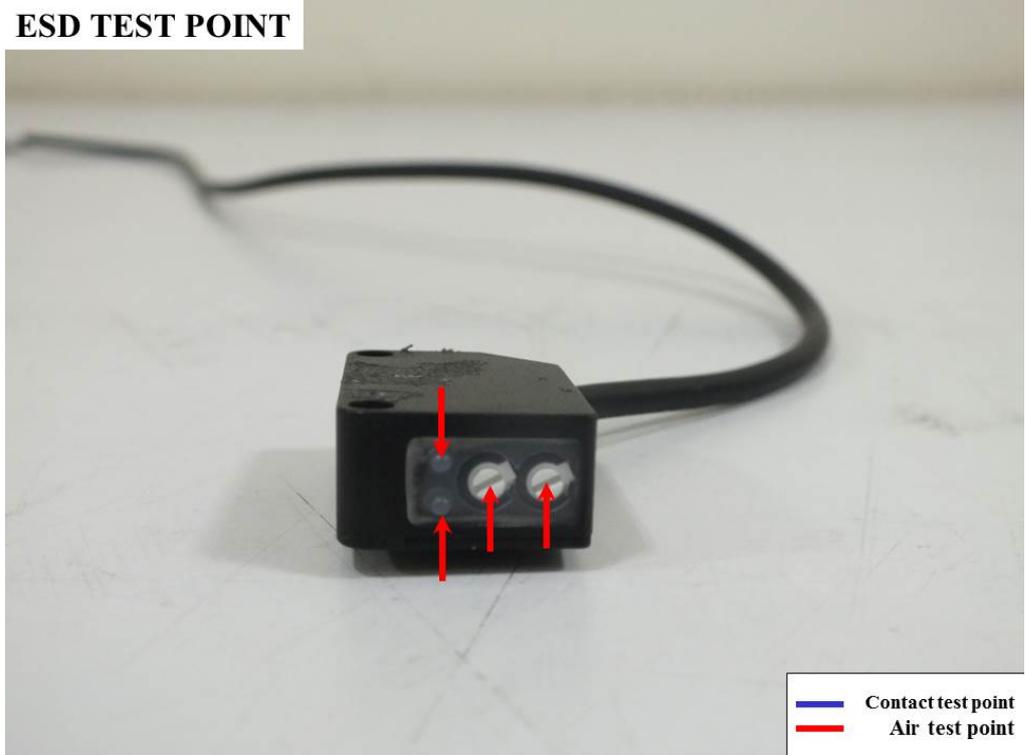
Rear view



Test Points

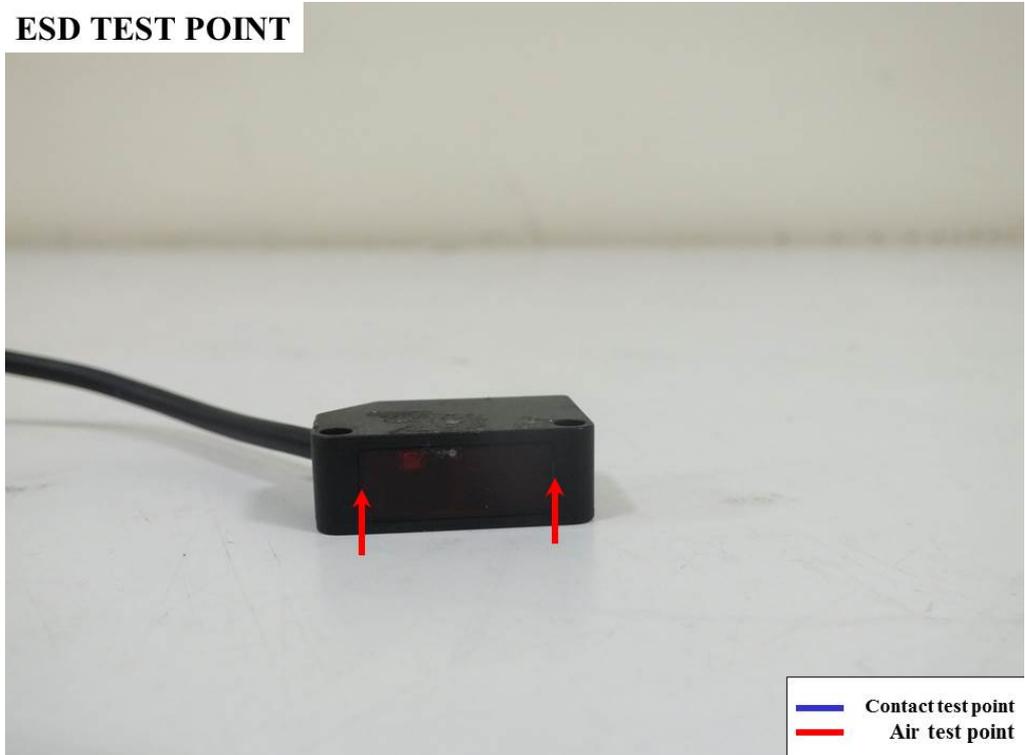
ESD TEST POINT

— Contact test point  
— Air test point



ESD TEST POINT

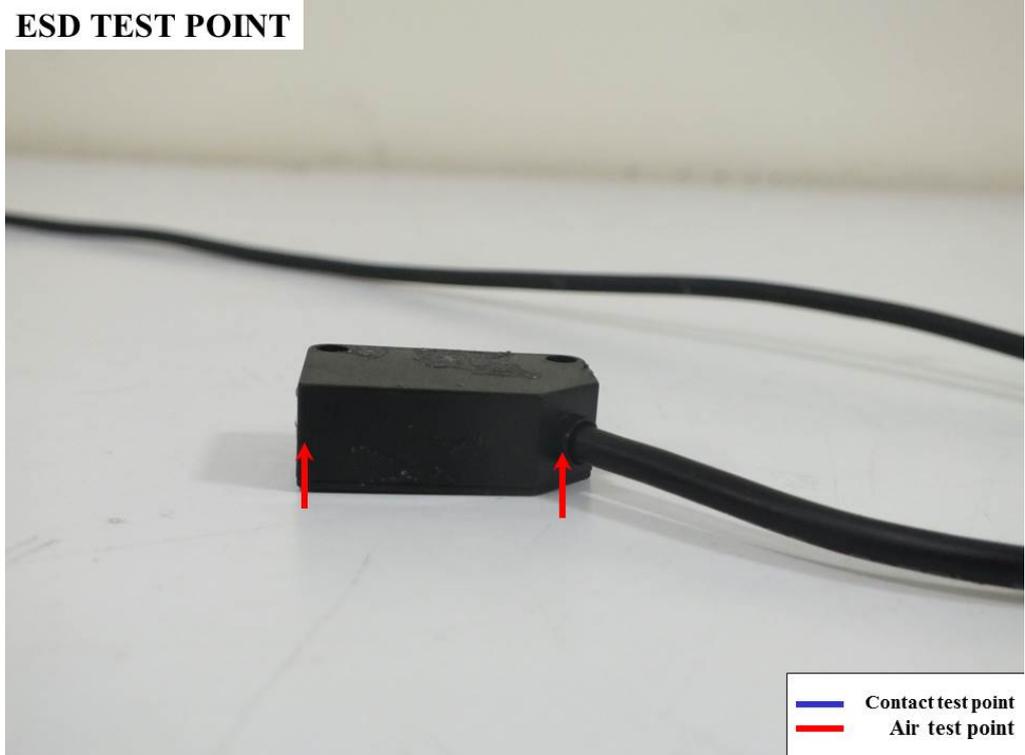
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— Air test point



Test Points

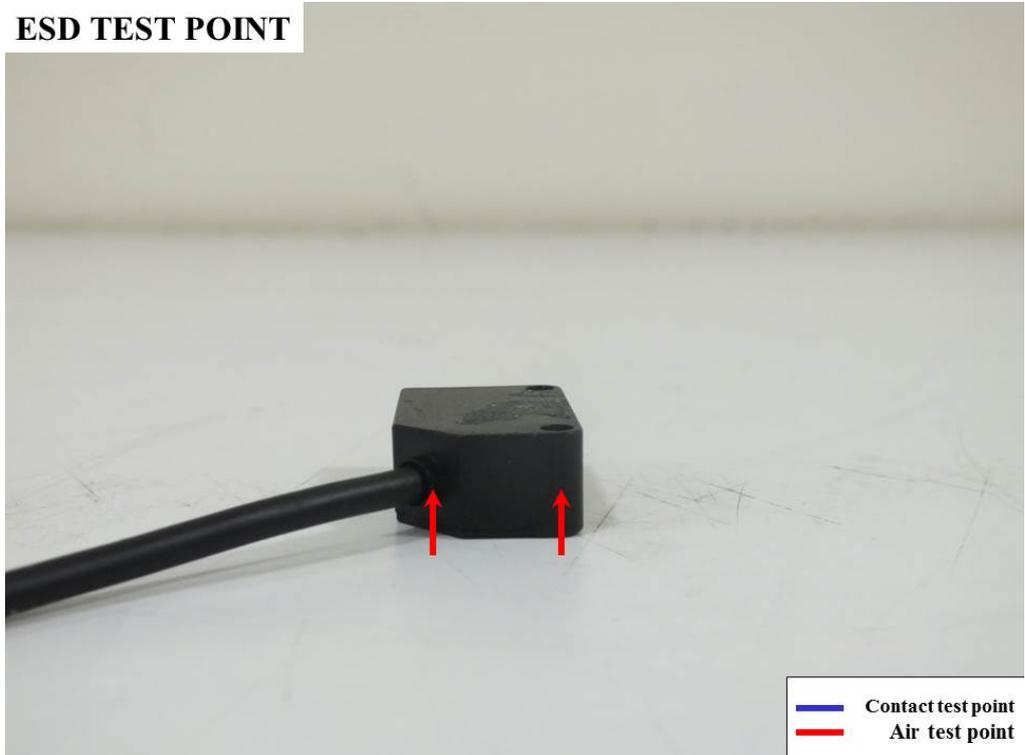
ESD TEST POINT

— Contact test point  
— Air test point



ESD TEST POINT

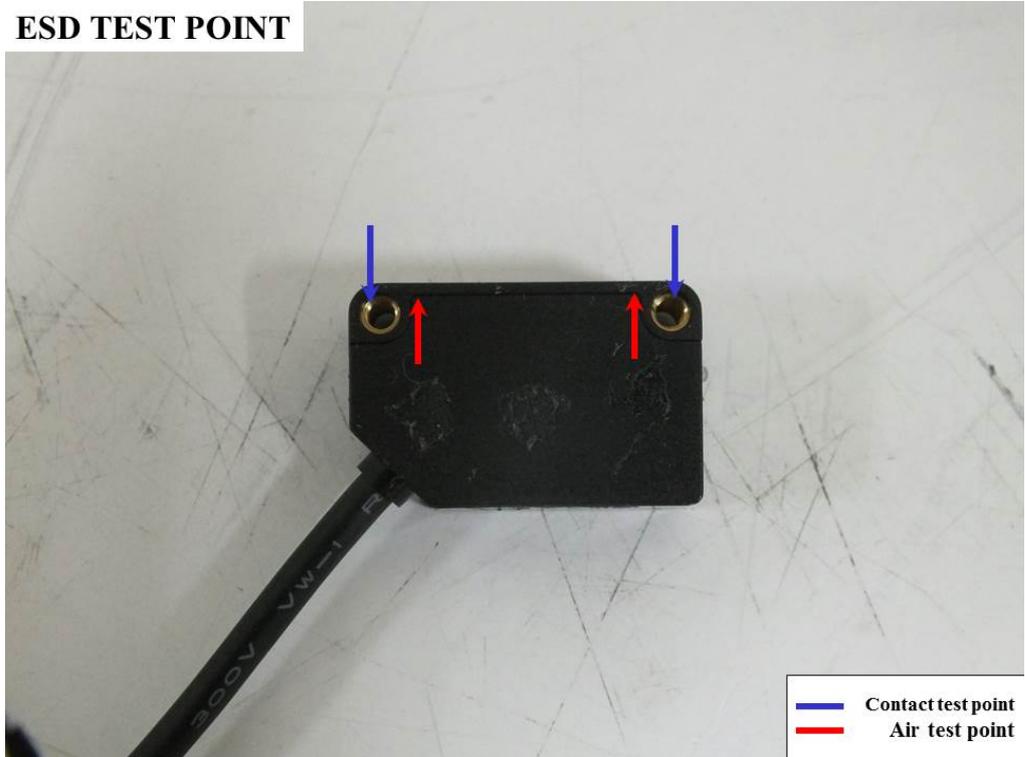
— Contact test point  
— Air test point



Test Points

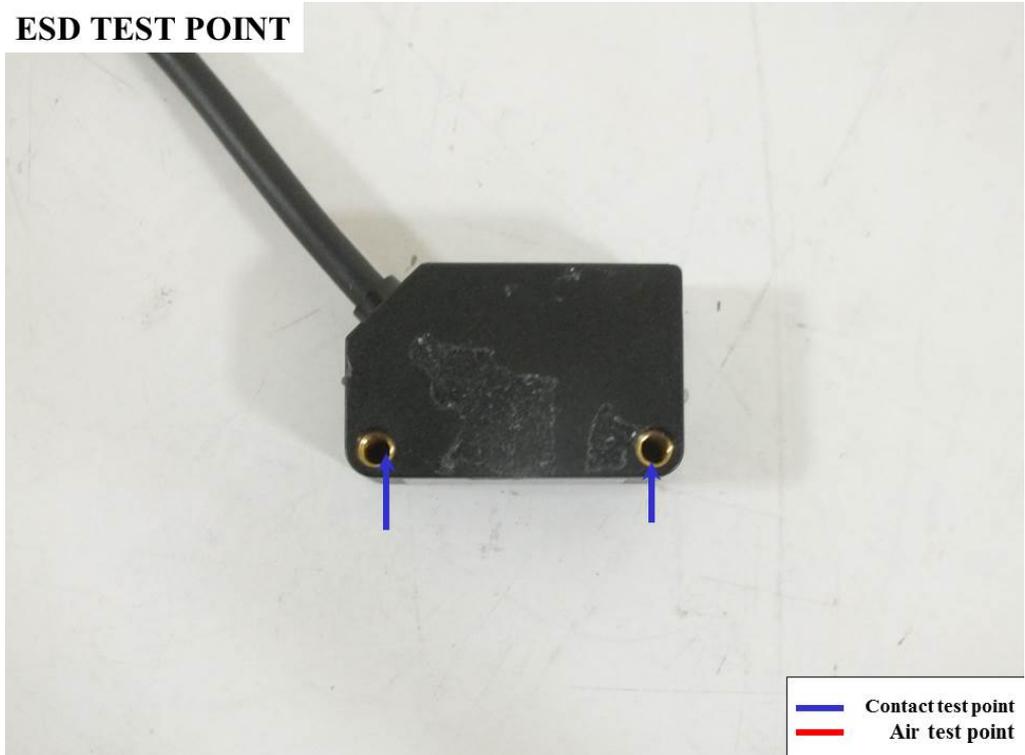
ESD TEST POINT

— Contact test point  
— Air test point



ESD TEST POINT

— Contact test point  
— Air test point

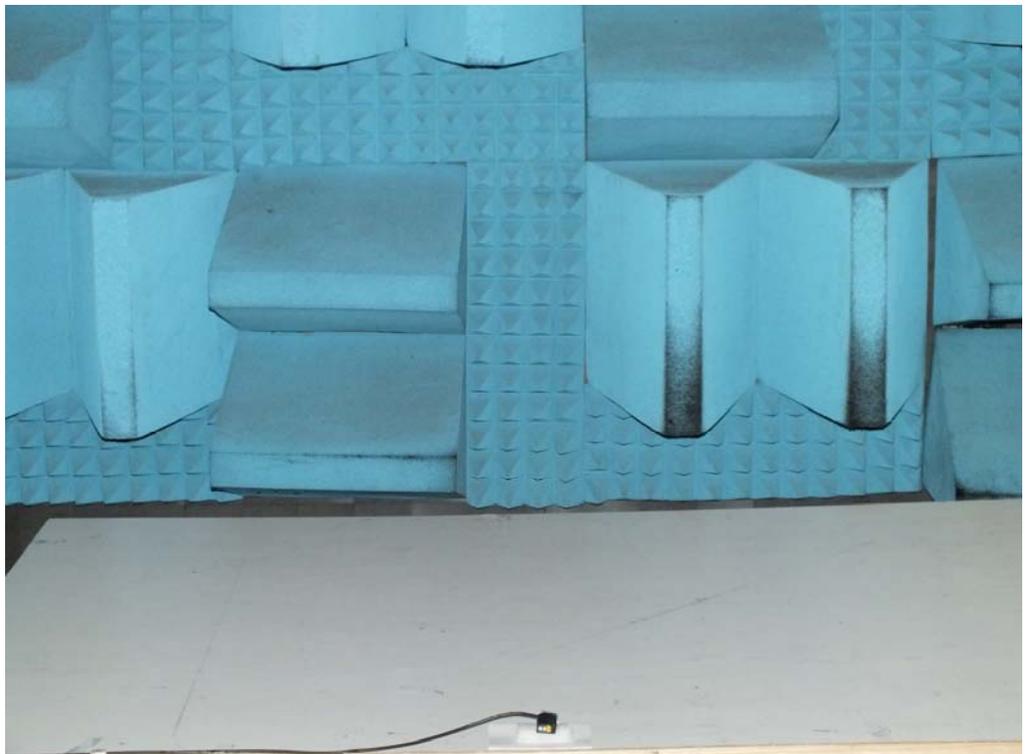


### 3. Photographs of RS Immunity Test Configuration

**Front view**



**Rear view**

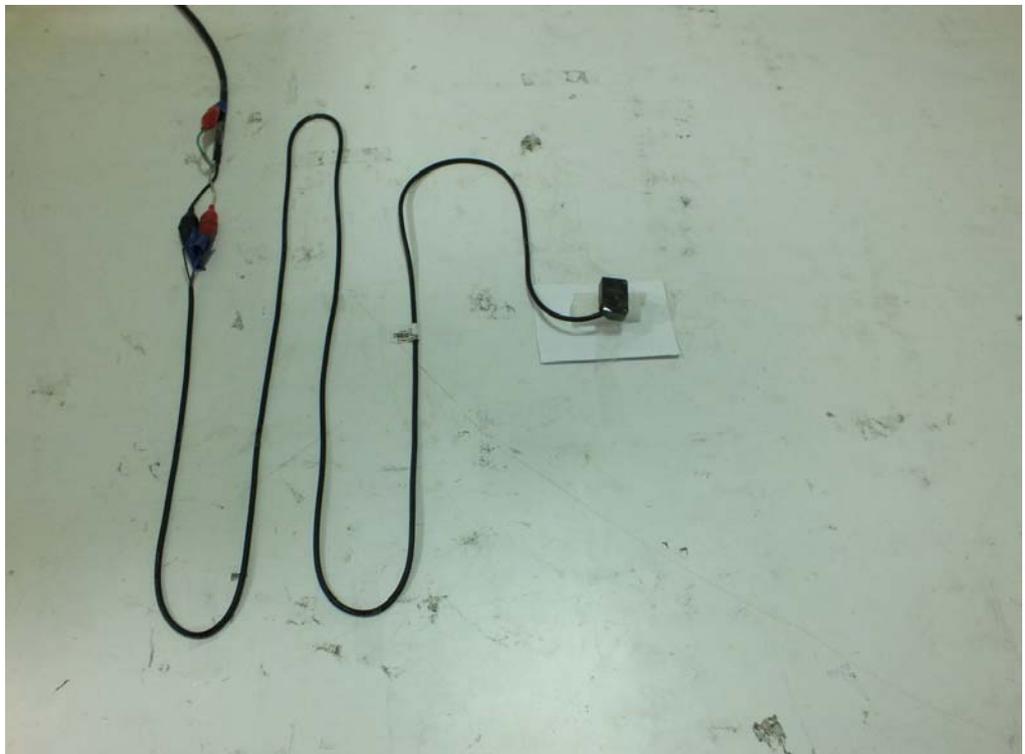


#### 4. Photographs of EFT Test Configuration

Front view

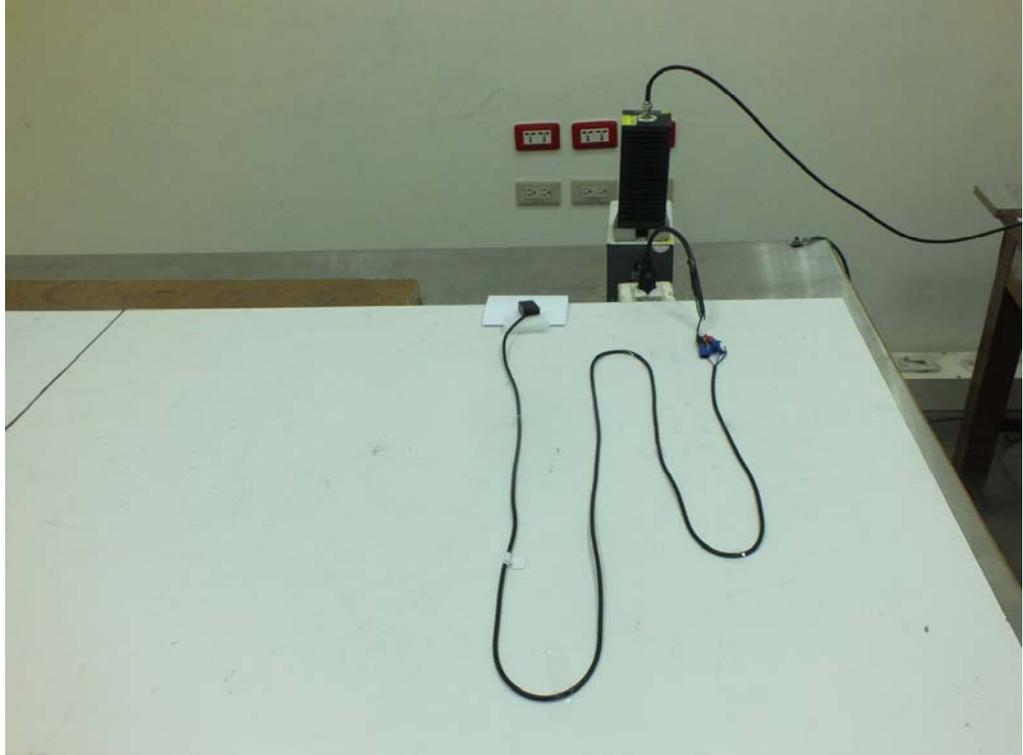


Rear view

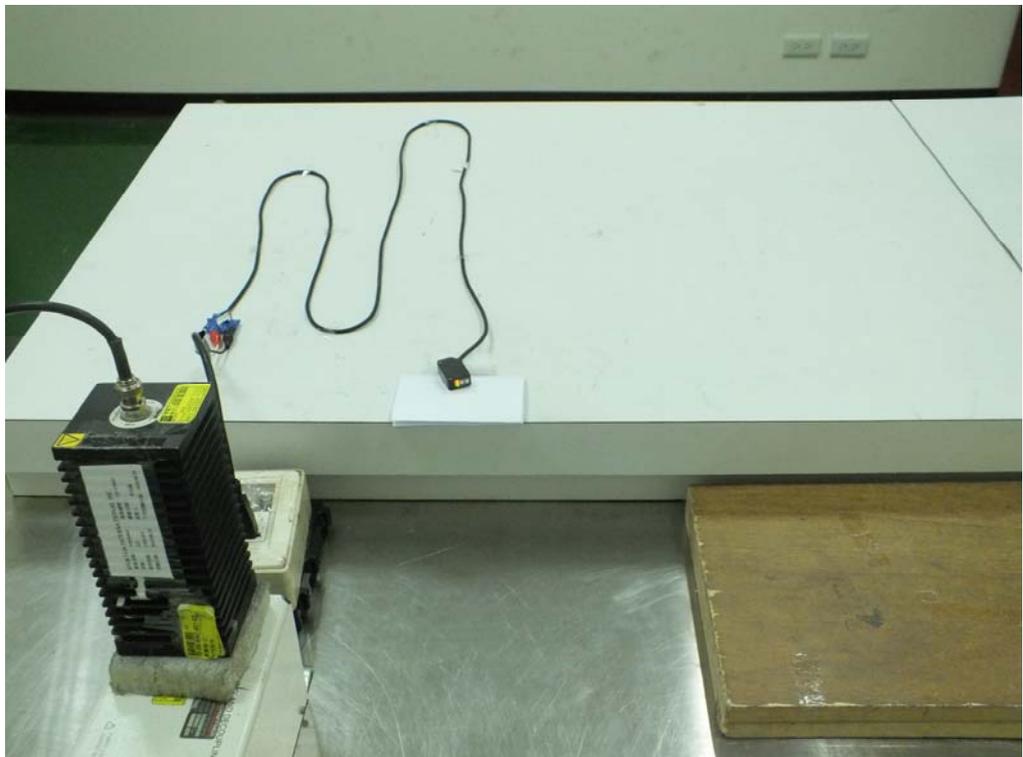


## 5. Photographs of CS Immunity Test Configuration

Front view



Rear view

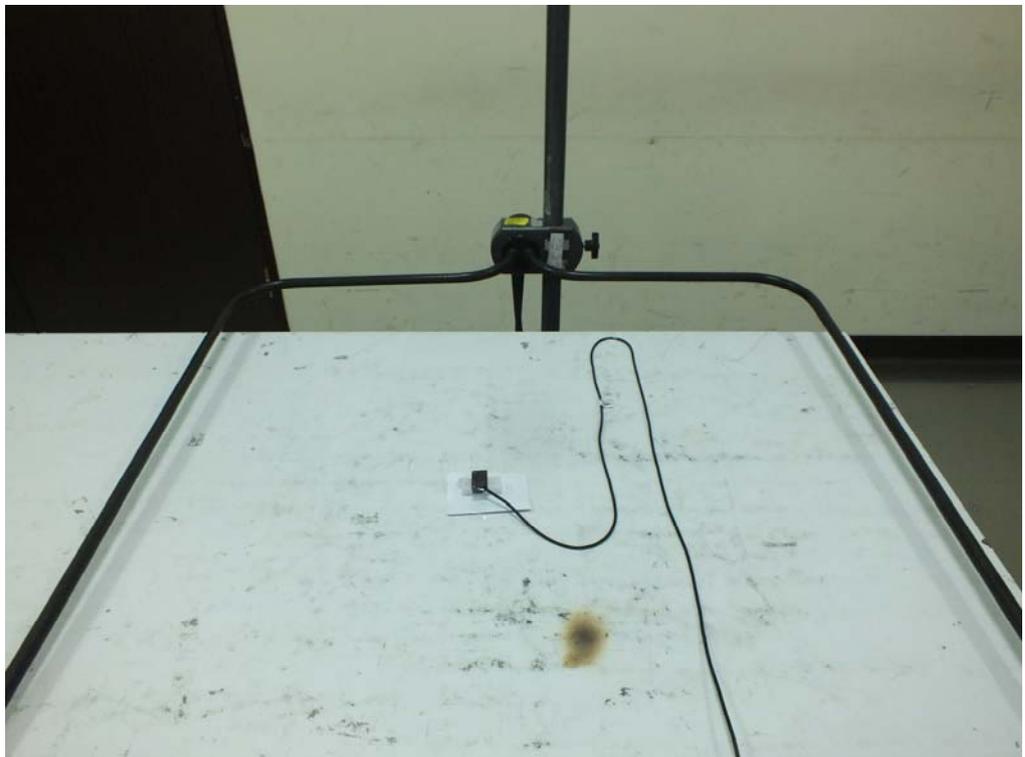


## 6. Power Frequency Magnetic Field immunity Measurement (PFMF)

Front view



Rear view



## APPENDIX B. Photographs of EUT

