ESTECH Co., Ltd.
Rm.1015, World Venture Center II,
426-5, Gasan-dong, Geumcheon-gu,
Seoul, 153-803, Korea

Testing and Certification Laboratory

Test Report for CE

Report Number	**ESTCE0904-016**			
Applicant	Company Name	Suprema Inc.		
	Address	16F Parkview Office Tower, Jeongja-dong, Bundang-gu,Seongnam, Gyeonggi, 463-863 Korea		
Product	Product type	RealScan-D		
	Model No.	RSD	Manufacturer	Suprema Inc.
	Serial No.	NONE	Country of origin	KOREA
Other	Receipt Date	16-Apr-09	Receipt Number	ESTC-09-00685
	Issued Date	22-Apr-09	Tested Date	2009-4-18 ~ 2009-4-20
Testing Location	ESTECH. Co., Ltd 58-1, Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea 97-1, Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea			
Standard	EMI Standard		EMS Standard	
	EN55022:2006+A1:2007 Class A		EN55024:1998+A1:2001+A2:2003 EN 61000-4-2:1995 +A1:1998 +A2:2001 EN 61000-4-3:2006+A1:2008 EN 61000-4-4:2004 EN 61000-4-5:2006 EN 61000-4-6:2007 EN 61000-4-11:2004	
Test Result	PASS			
Tested by	H.H.Lee / Senior Engineer	(Signature)		
Approved by	J.M. Yang / Engineering Manager	(Signature)		

ESTECH CO., LTD.
Rm. 1015 World Venture Center, 426-5 Gasan-dong, Geumcheon-gu,
Seoul, 153-803, Korea. Tel:82-2-867-3201, Fax:82-2-867-3204

* Note

o This is certified that the above mentioned products have been tested for the sample provided by client.
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Contents

1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and tested in accordance with the measurement procedures as indicated in this report ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab. assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test lab.

Corporation Name : ESTECH Co. Ltd.

Head Office : Head Office : Rm 1015, World Venture Center II, 426-5, Gasan-dong, Geumcheon-gu, Seoul, Korea (Safety & Telecom. Test Lab)

EMC Test Lab. : 58-1, Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1, Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Registration Information

Our Test lab has worked test lab system by ISO/IEC 17025:2005 and was registered the follows certification body

KCC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecom.

KOLAS : Granted Accreditation from Ministry of commerce, Industry & Energy for EMC, Safety and Telecom

EK : Granted Accreditation from Ministry of commerce, Industry & Energy for Safety

FCC : Filed Laboratory at Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference by Information Technology Equipment

2. Description of EUT

2.1 Summary of Equipment Under Test

¨ EUT Name : RealScan-D

¨ Model Number : RSD

¨ Serial Number : NONE

¨ Manufacturer : Suprema Inc.

¨ Country of origin : KOREA

¨ Power Rating : Supplied from PC USB Port

¨ X-tal : 18.432MHz, 30MHz

3. Measurement Condition

3.1 EUT Operation.

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

1. Check to normal mode operation

2. The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission.
3. Connect the EUT to pc usb port.
4. Install scanning program in the PC.
5. Put hand to Fingerprint system and check action availability from PC.

3.2 Cable Connecting

Start Equipment		End Equipment		Cable		Remark
Name	**I/O port**	**Name**	**I/O port**	**Length**	**Shielded**	
RealScan-D	USB	Personal Computer	USB	1.5	Shielded	
Personal Computer	USB	Mouse	USB	2.0	Shielded	
Personal Computer	USB	Keyboard	USB	2.0	Shielded	
Personal Computer	RGB	LCD Monitor	RGB	2.0	Shielded	
Personal Computer	USB	Printer	USB	2.0	Shielded	
Printer	POWER	Adapter	-	2.0	UnShielded	

3.3 EUT Configurations

Equipment Name	Model Name	S/N	Manufacturer	Remark (CE ID)
RealScan-D	RSD	NONE	Suprema Inc.	**E.U.T**
Personal Computer	DCGAF	HKKPHBX	Dell Inc.	
LCD Monitor	M1717AD	702SRXP36394	SERONICS	
Printer	MJC-5750	NA34BFFP313402V	SAMSUNG ELECTRONICS(SHANDONG)DIGITAL PRINTING Co.,Ltd.	
Adapter	PA8040WB	0703016326	Bestec Electronics(DongGuan) Co.,Ltd.	
Keyboard	SK-8115	NONE	YET FOUNDATE LTD	
Mouse	M-UAG96B	LZ747AL	Logitech	

4. Electromagnetic Interference Test

4.1 Measurement of radiated emission

The test setup was made according to EN55022:2006+A1:2007 Class A on an open test site, which allows a 10 m distance measurement. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

4.1.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESVS10	Rohde & Schwarz	838562/002	29-Jan-10
Spectrum Analyzer	R3273	ADVANTEST	110600592	9-Jun-09
Logbicon Antenna	VULB 9160	Schwarzbeck	3142	15-May-09
Amplifier	8447F	HP	2805A02972	26-Jun-09
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
Multi Device Controller	2090	EMCO	1535	-

4.1.2 Environmental conditions

Section	Temperature (°C)	Humidity (%)
Radiated emission	13	37
Test Place	Open site : 10m	

4.1.3 Test data

Test Date : 18-Apr-09

Frequency [MHz]	Reading [dBuV]	Position [V/H]	Height [m]	Correction Factor		Result Value [dBuV/m]		Margin [dB]
				Antenna [dB/m]	Cable etc. [dB]	Limit	Result	
37.32	13.60	V	1.0	11.35	0.94	40.0	25.89	14.11
70.83	14.10	V	1.0	9.64	1.30	40.0	25.03	14.97
132.09	11.60	V	1.0	12.14	1.83	40.0	25.58	14.42
175.25	18.60	H	4.0	11.48	2.19	40.0	32.27	7.73
215.75	15.40	V	1.0	10.21	2.48	40.0	28.10	11.90
228.86	9.70	V	1.0	10.67	2.59	40.0	22.96	17.04
260.94	9.70	H	4.0	11.74	2.86	47.0	24.29	22.71
318.70	13.70	H	3.2	13.34	3.39	47.0	30.43	16.57
326.08	10.70	V	1.0	13.50	3.46	47.0	27.66	19.34
393.00	11.40	V	1.0	14.98	3.95	47.0	30.33	16.67
480.06	10.40	H	1.5	16.87	4.59	47.0	31.86	15.14
541.76	7.60	V	1.0	18.03	5.16	47.0	30.79	16.21
619.75	7.90	V	1.0	19.69	5.54	47.0	33.13	13.87
770.33	5.10	V	1.0	21.94	6.84	47.0	33.88	13.12
Remark	*Result Value=Reading+Correction Factor *Correction Factor=Antenna factor+Cable loss							

◆ Setup for Radiated Test : 30 ~ 1000 MHz

[Front]

[Rear]

4.2 Conducted emission test

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to EN55022:2006+A1:2007 Class A. The test setup was made according to EN55022:2006+A1:2007 Class A in a shielded Room. The EUT was placed on a non-conductive table at least 80 above the ground plane. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m. The test receiver with Quasi peak detector.

4.2.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	NNLA8120A	Schwarzbeck	8120161	21-Feb-10
LISN	ESH3-Z5	Schwarzbeck	838979/010	21-Feb-10
TEST Receiver	ESPI7	Rohde & Schwarz	100185	27-Aug-09
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	10-Sep-09

4.2.2 Environmental conditions

Section	Temperature (°C)	Humidity (%)
Conducted emission	21	42
Test Place	shielded Room	

4.2.3 Test data

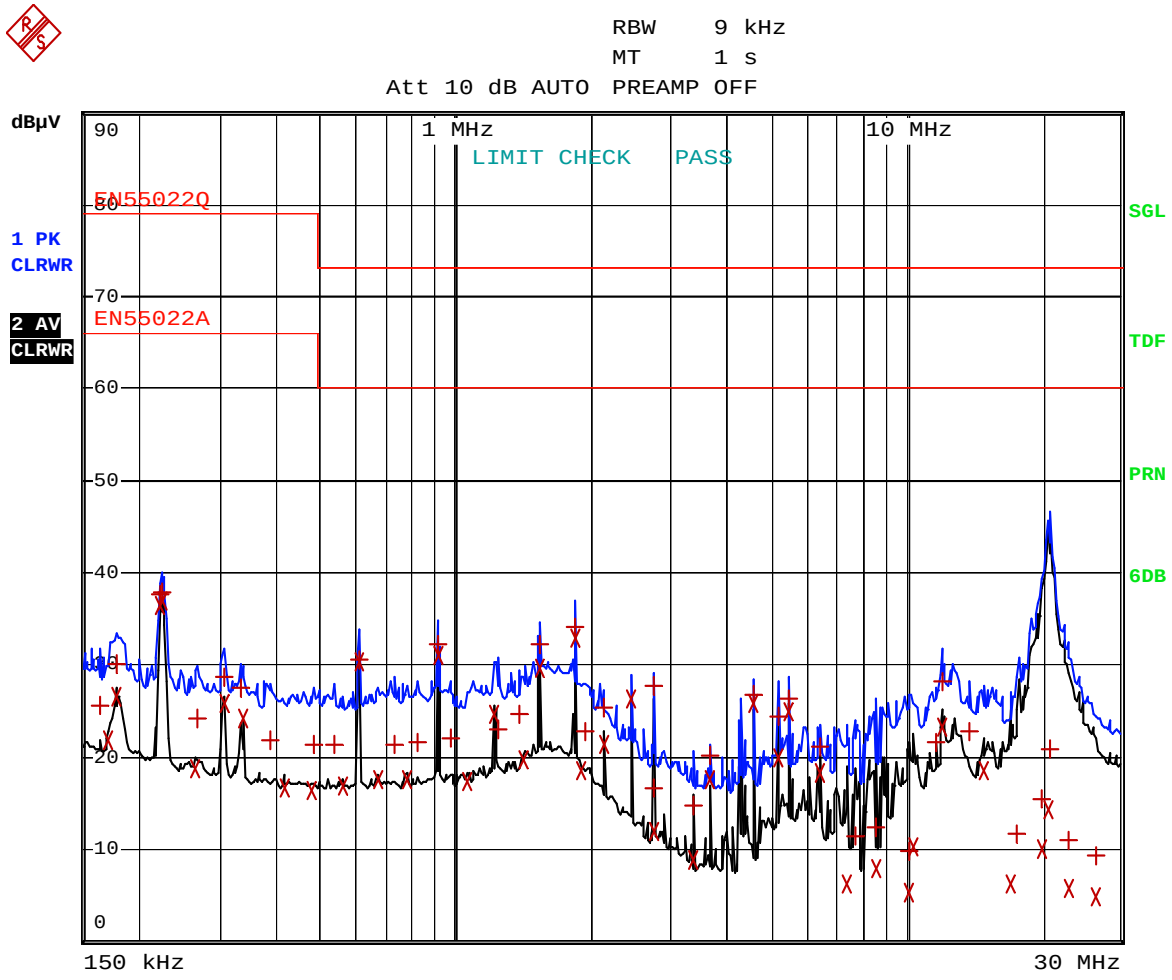
Test Date : 18-Apr-09

Frequency (MHz)	Correction Factor (dB)		Line (H/N)	Quasi-peak Value (dBuV)			Average Value (dBuV)		
	LISN	Cable etc.		Limit	Reading	Result	Limit	Reading	Result
0.18	0.10	0.23	H	79.0	30.22	30.55	66.0	26.64	26.97
0.22	0.10	0.23	H	79.0	38.02	38.35	66.0	37.02	37.35
0.23	0.09	0.23	N	79.0	37.14	37.46	66.0	35.66	35.98
0.31	0.09	0.23	N	79.0	31.25	31.57	66.0	29.94	30.26
0.34	0.10	0.25	H	79.0	27.50	27.85	66.0	24.15	24.50
0.62	0.10	0.38	H	73.0	30.53	31.01	60.0	30.39	30.87
0.92	0.11	0.47	N	73.0	33.50	34.08	60.0	32.50	33.08
1.23	0.12	0.49	N	73.0	30.20	30.81	60.0	29.11	29.72
1.53	0.14	0.46	H	73.0	32.20	32.80	60.0	29.72	30.32
1.84	0.15	0.43	H	73.0	34.18	34.76	60.0	32.84	33.42
20.57	0.80	1.15	N	73.0	30.84	32.79	60.0	23.25	25.20

Remark	H : Hot Line, N : Neutral Line *Result Value=Reading+Correction Factor *Correction Factor=LISN factor+Cable loss

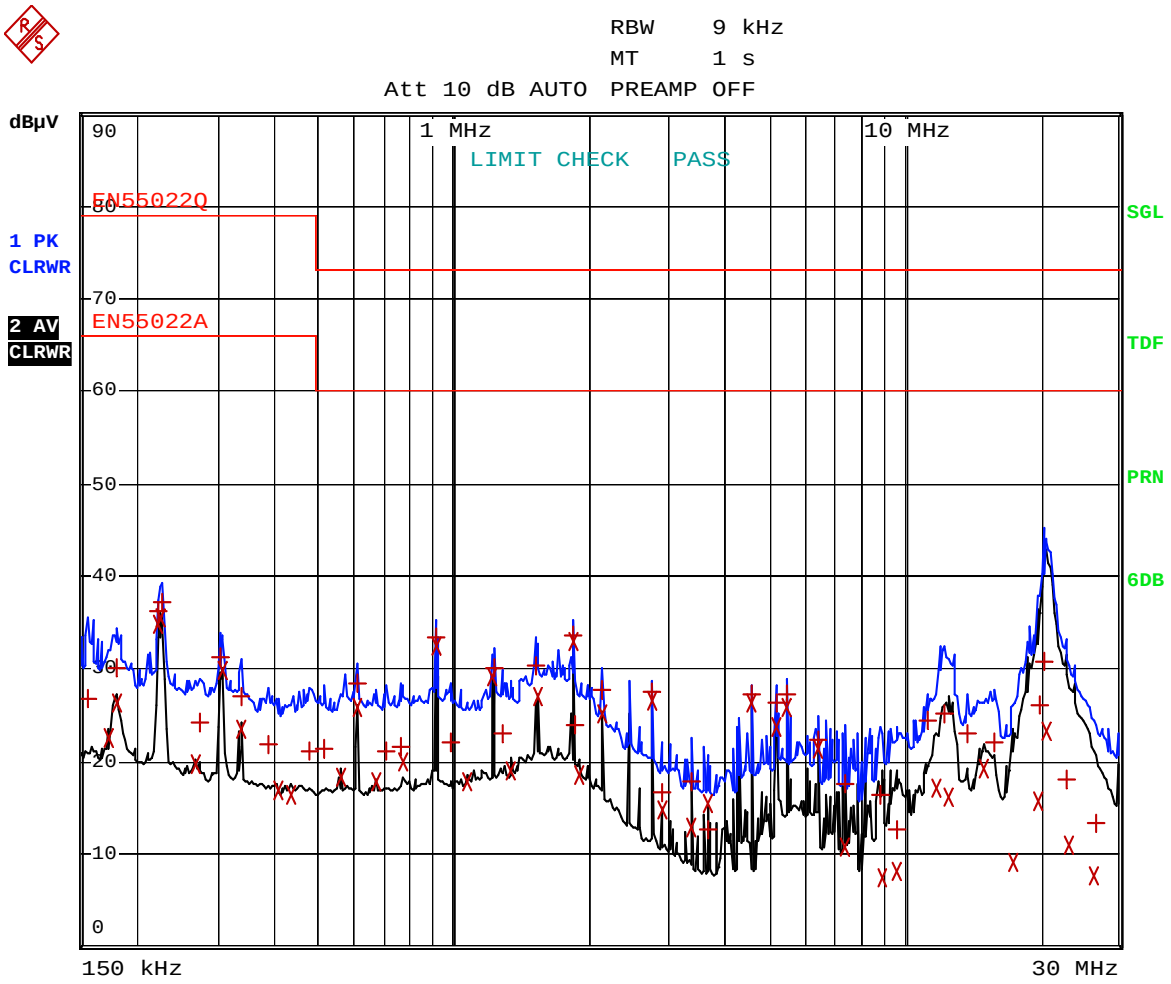
4.2.4 Spectral Diagram

◆ Hot Line



Comment: RSD-HOT
Date: 18.APR.2009 09:47:11

◆ NEUTRAL Line



Comment: RSD-NEUTRAL
Date: 18.APR.2009 09:52:07

◆ Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]

[Rear]

4.3 Limits concerning harmonic current test

The harmonics on AC Mains in the frequency from 0 to 2 kHz were measured in accordance to EN 61000-3-2:2006

The objective of this standard is to set limits for harmonic emissions of equipment within its scope, so that, with due allowance for the emissions from other equipment, compliance with the limits ensures that harmonic disturbance do not exceed the compatibility levels defined in EN61000-3-2.

For the purpose of harmonic current limitation, equipment is classified as follows.

Class A : - Balanced three-phase equipment;
- Household appliances excluding equipment identified as Class D;
- Tools excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Equipment not specified in one of the three other classes shall be considered as Class A equipment.

Class B : - Portable tools;
- Arc welding equipment which is not professional equipment.

Class C : - Lighting equipment.

Class D : Equipment having a specified power less than or equal to 600 W, of the following types:
- Personal computers and personal computer monitors;
- Television receivers.

4.3.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Test System	PHF555	HAEFELY	08419-11	7-Dec-09
Upgrade test system	PHF X	HAEFELY	151336	-

4.3.2 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)

◆ Setup Figure

N/A

4.3.3 Test data

Test Date :

***It does not need to test this requirement,**
because the input power of the EUT is supplied from PC

4.4 Limits Concerning Voltage Fluctuations & Flicker test

The voltage fluctuations on AC mains in the frequency range from 0 to 2 kHz were measured in accordance to EN61000-3-3:1995+A1:2001+A2:2005

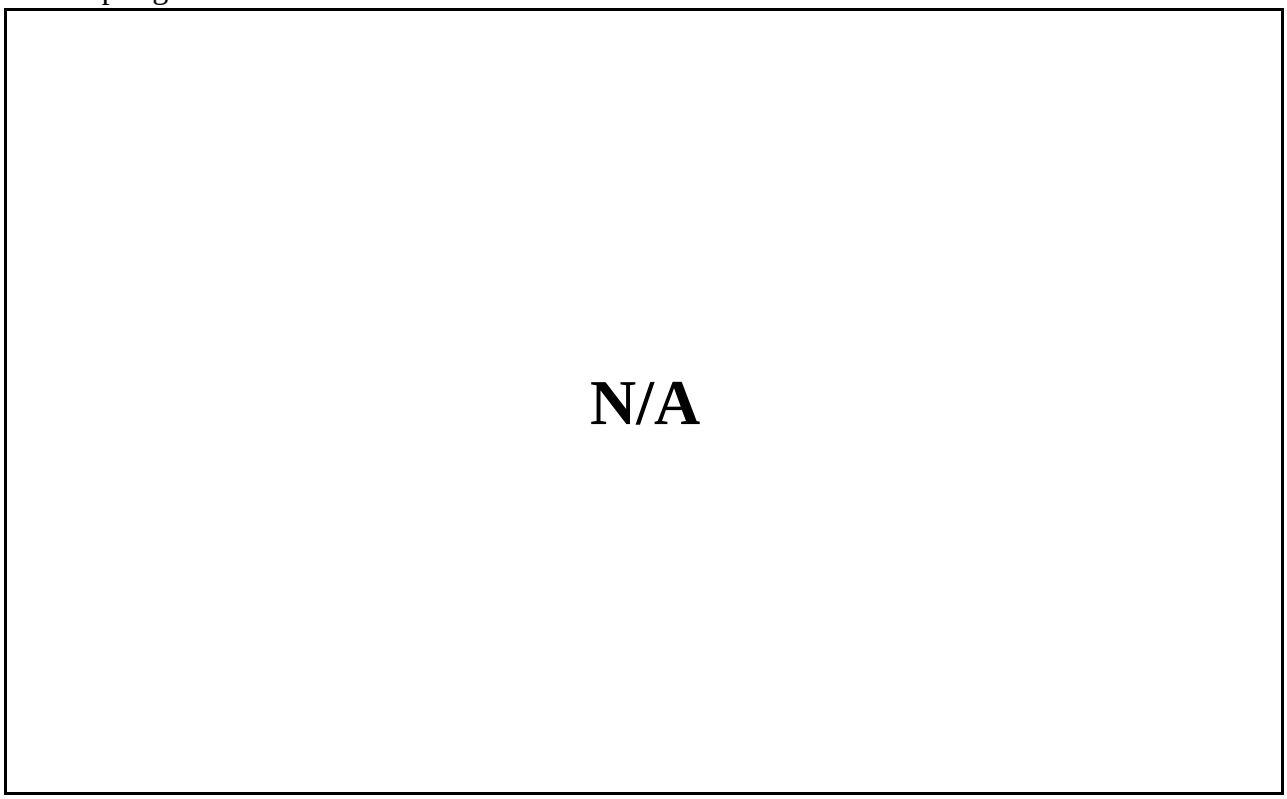
4.4.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Test System	PHF555	HAEFELY	08419-11	7-Dec-09
Upgrade test system	PHF X	HAEFELY	151336	-

4.4.2 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)

◆ Setup Figure



4.4.3 Test data

Test Date :

***It does not need to test this requirement,**
because the input power of the EUT is supplied from PC

5. Electromagnetic Susceptibility Test

5.1 Electromagnetic Discharge test

5.1.1 Test Standard

- Standard :EN 61000-4-2:1995 +A1:1998 +A2:2001
- Performance criteria for alarm device : Criterion B
- Energy storage capacitance : 150pF (±10%)
- Discharge resistance : 330 ohm (±10%)
- Charging resistance : 50 Mohm (50 ~100Mohm)
- Tolerance of the output voltage indication : ± 5%
- Polarity of the output voltage : Positive(+) and Negative(-)
- Holding time : at least 5s
- Discharge, Mode of operation : Single discharge
- Interval discharge time : At least 1s
- Repetition time : At least 200 discharges. 100 each at negative and positive polarity of four test points (a minimum of 50 discharges of each point)

  · At least 50 indirect discharge(contact) to the center of the front edge of the horizontal coupling plane

  · At least 200 indirect discharges shall be applied in the indirect mode use of the vertical conducting plane.

5.1.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
ESD Simulater	NSG438	Schaffner	601	26-Jun-09

5.1.3 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
22	43	101.5

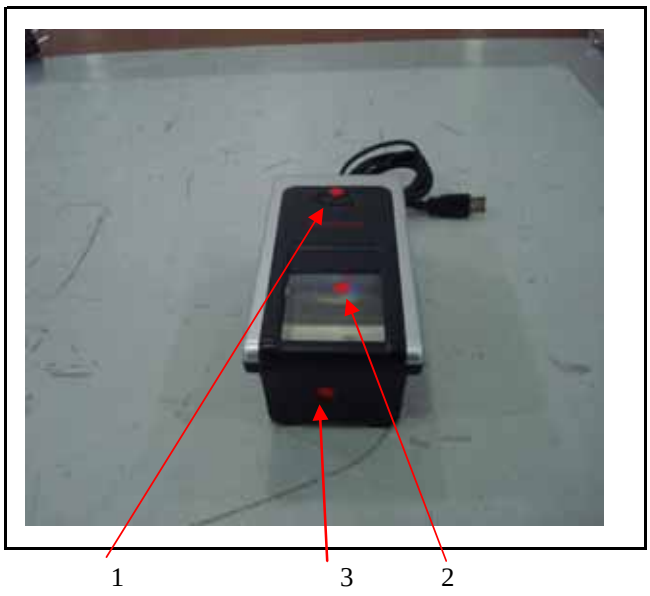
5.1.4 Test data

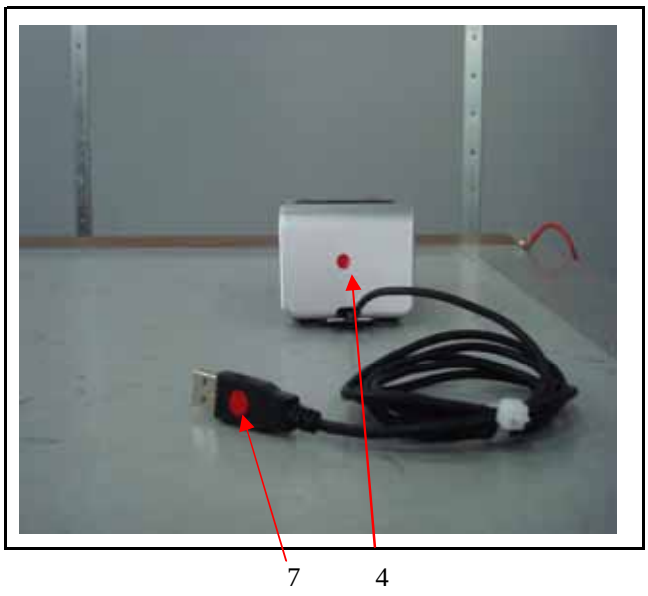
Test Date : 18-Apr-09

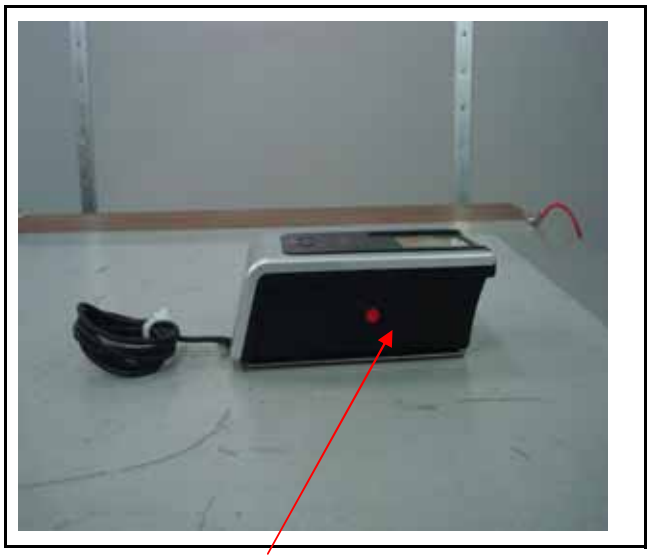
Point	Test Method	Test Voltage (+/-)	Criterion	Result	Remark
HCP	Horzontal Coupling	2,4kV	B	A	
VCP	Vertical Coupling	2,4kV	B	A	
1	Air discharge	2,4,8kV	B	A	
2	Air discharge	2,4,8kV	B	A	
3	Air discharge	2,4,8kV	B	A	
4	Air discharge	2,4,8kV	B	A	
5	Air discharge	2,4,8kV	B	A	
6	Air discharge	2,4,7kV	B	A	
7	Air discharge	2,4,8kV	B	A	
Remark	RED LINE:Air discharge BLUE LINE:Contact discharge				

◆ Setup Figure

◆ Test Point







1 The button part

2 The top glass part

3 The center case part

4 The top case part

5 The left side

6 The right side

7 The USB port

HCP: Indirect Discharge

VCP : Indirect Discharge

5.2 Radiated Electromagnetic Fields test

5.2.1 Test Standard

- EN 61000-4-3:2006+A1:2008
- Criterion standard : A
- Frequency Range : 80 MHz ~ 1000MHz
- Test Angle : 0°, 90°, 180°, 270°
- Sweep Capability : 1.5×10^{-3} decade/s
- Step Size : 1% of Fundamental
- Antenna Polarity : Horizontally/Vertically
- Measurement Distance : 3m
- Modulation : AM 80% with 1kHz sine wave
- Dwell time : 3 seconds
- Field Strength:3V/m

5.2.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Hybrid Log Periodic Antenna	LPDA-0803	TDK	130243	N/A
Amplifier	250W1000AM1	Amplifier Research	311841	4-Jun-09
Signal Generator	8648C	HP	3623A03549	11-Jul-09
Power Sensor	URV5-Z2	Rohde & Schwarz	100592	15-Oct-09
Power Meter	NRVD	Rohde & Schwarz	DE25524	15-Oct-09
System Interface	SI-300-2	TDK	41610	N/A

5.2.3 Environmental Conditions

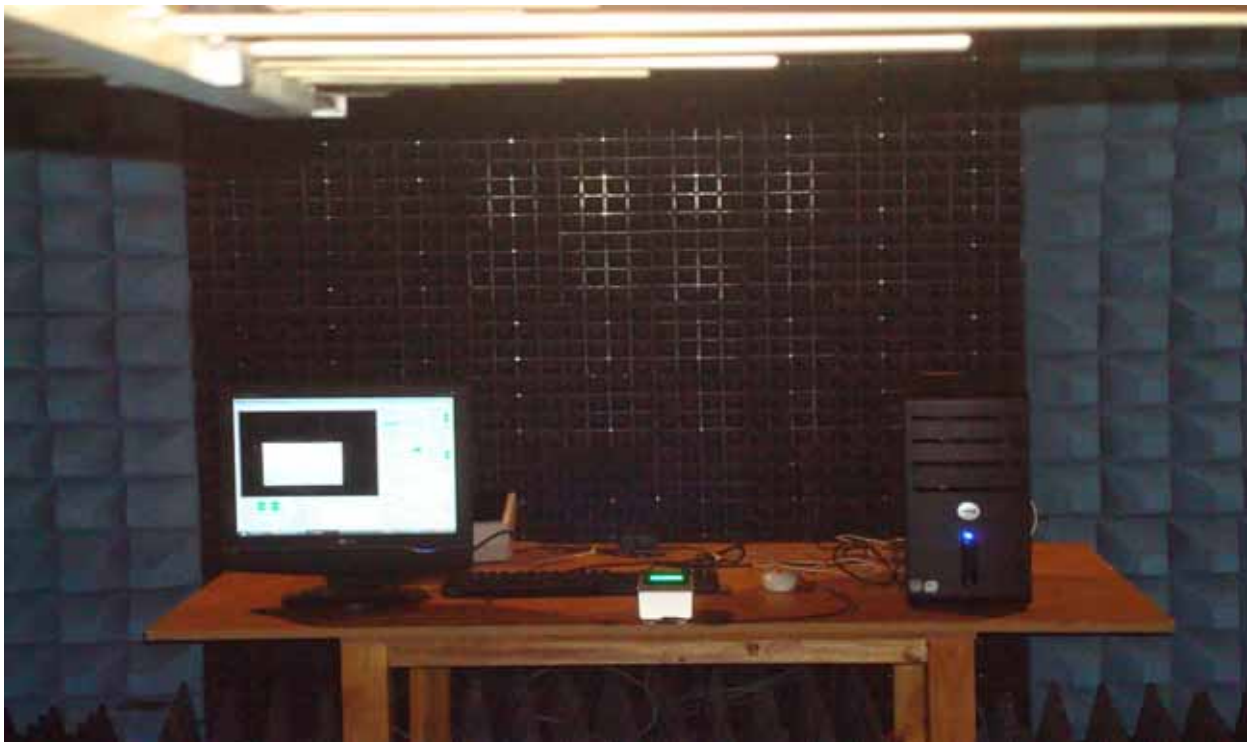
Temperature (°C)	Humidity (%)	Pressure (kPa)
21	40	101.6

5.2.4 Test data

Test Date : 18-Apr-09

Range of Frequency (MHz)	Position	Polarity	Electromagnetic Intensity (V/m)	Criterion	Result
80MHz ~ 1 GHz	Front side	H	3	A	A
		V	3	A	A
	Right side	H	3	A	A
		V	3	A	A
	Left side	H	3	A	A
		V	3	A	A
	Rear side	H	3	A	A
		V	3	A	A
Reference	H : Horizontality, V : Verticality *Frequecy range:80MHz to 1GHz				

◆ Setup Figure



5.3 Electrical Fast Transients/Burst test

5.3.1 Test Standard

- Standard : EN 61000-4-4:2004
- Performance appraisal standard : B
- Test voltage : AC power : ±1kV , other port : ±0.5kV
- Polarity : Positive(+), Negative(-)
- Repetition Frequency : 5kHz
- Duration Time : 60s

5.3.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Burst Generator	BEST EMC V2.7	SCHAFFNER	200220-033SC	30-Mar-10

5.3.3 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
21	41	101.6

5.3.4 Test data

Test Date : 20-Apr-09

Tested Point		Test Voltage	Duration Time (s)	Criterion	Result	Remark
Input AC	L1	±1kV	60s	B	A	
	L2	±1kV	60s	B	A	
	PE	±1kV	60s	B	A	
	L1 + L2	±1kV	60s	B	A	
	L1 + PE	±1kV	60s	B	A	
	L2 + PE	±1kV	60s	B	A	
	L1 + L2 +PE	±1kV	60s	B	A	
Reference		L1: Line, L2: Neutral, PE: Protective earth (Ground)				

◆ Setup Figure

5.4 Surge Test

5.4.1 Test Standard

- Standard : EN 61000-4-5::2006
- Performance appraisal standard : B
- Test voltage AC : line-earth : ±2kV, line-line : ±1kV,
  Telecom. & signal : Line-earth : ±1kV, DC port :±0.5kV
- Polarity : Positive(+), Negative(-)
- Repetition rate:max 1/min.
- Number of tests:at least five positive and five negative at the selected points.
- Phase shifting:in a range between 0 to 360 versus the a.c. line phase angle.

5.4.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Surge Generator	BEST EMC V2.7	SHAFFNER	200220-033SC	30-Mar-10

5.4.3 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
22	40	101.5

5.4.4 Test data

Test Date : 20-Apr-09

Tested Point		Test Voltage	Criterion	Result	Remark
Input AC	L1 - L2	±1kV	B	A	
	L1 - PE	±2kV	B	A	
	L2 - PE	±2kV	B	A	
Reference		L1: Line, L2: Neutral, PE: Protective earth (Ground)			

◆ Setup Figure

5.5 Conducted Disturbance test

5.5.1 Test Standard

- Standard : EN 61000-4-6:2007
- Performance appraisal standard : A
- Frequency Range : 0.15~80 MHz
- Field Strength : 3.0V
- Modulation : AM 80% with 1kHz sine wave
- Dwell time : 3 seconds
- Sweep Capability : 1.5×10^{-3} decade/s
- Step Size : 1% of Fundamental

5.5.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Amplifier	75A250AM1	Amplifier Research	312197	4-Jun-09
Signal Generator	8648C	HP	3623A03549	11-Jul-09
Power Sensor	URV5-Z2	R&S	100592	15-Oct-09
Power Meter	NRVD	R&S	DE25524	15-Oct-09
ATTENUATOR	50FH-006-300-2	Amplifier Research	NONE	N/A
System Interface	SI-300-2	TDK	41610	N/A
CDN	FCC-801-M3-32A	FCC	99129	7-Apr-10

5.5.3 Environmental Conditions

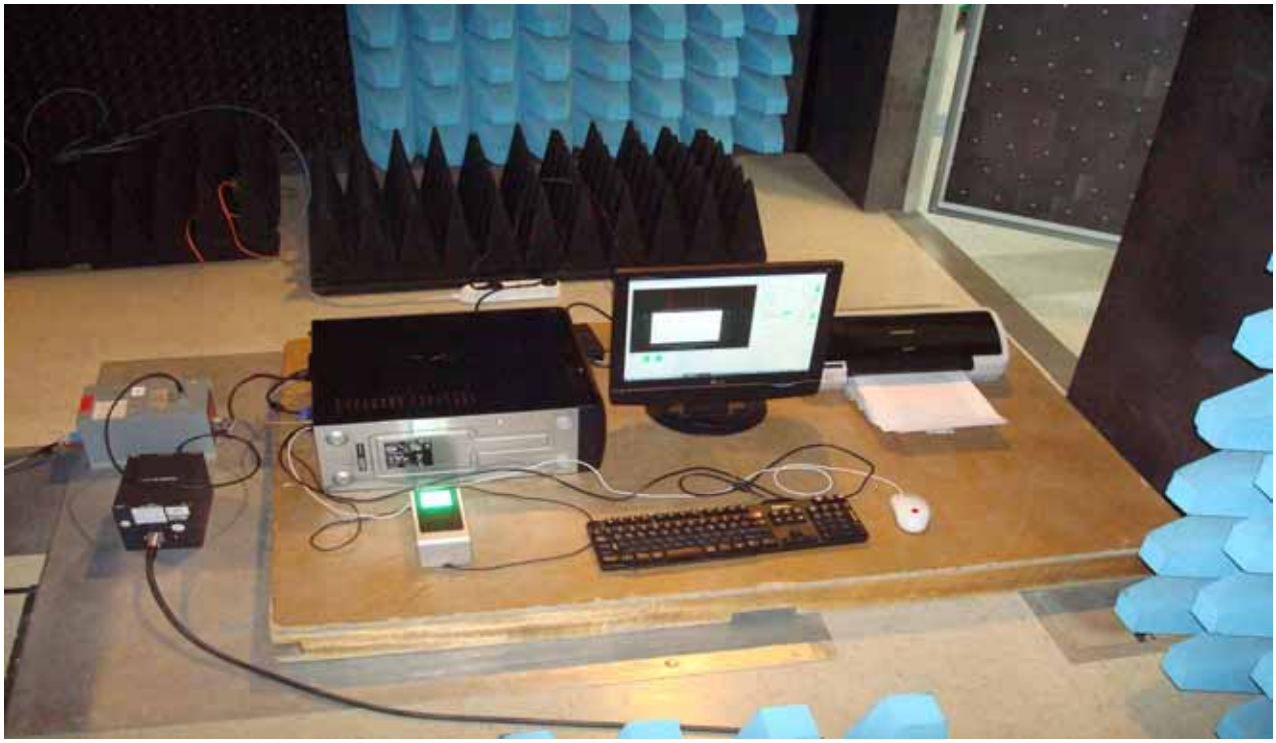
Temperature (°C)	Humidity (%)	Pressure (kPa)
21	40	101.6

5.5.4 Test data

Test Date : 20-Apr-09

Freq [MHz]	Level [V]	Tested point	Criterion	Result	Remark
0.15~80	3	Mains(M3)	A	A	

◆ Setup Figure



5.6 Voltage Dips and Interruptions test

5.6.1 Test Standard

- Standard : EN 61000-4-11:2004
- Performance appraisal standard and test level
  >95% 250 cycles : C , >95% 0.5cycles : B, 30% 25 cycles : C
- Number of pulses : 3 at each level
- Recovery time between pulses : 10 seconds

5.6.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Dip Generator	BEST EMC V2.7	SCHAFFNER	200220-033SC	27-Mar-09
Test System	PHF555	HAEFELY	08419-11	7-Dec-09
Upgrade test system	PHF X	HAEFELY	151336	N/A

5.6.3 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
22	41	101.5

5.6.4 Test data

Test Date : 20-Apr-09

Test level	Duration Cycles	Criterion	Result	Remark
95%	0.5	B	A	
30%	25	C	A	
95%	250	C	C	
Reference	Testing voltage: 230 Va.c./ 50 Hz The power of the EUT is supplied from PC .			

◆ Setup Figure

6. EUT Photographs

[Front]

[Rear]

[Inside]