



**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	ESTCE1002-002			
Applicant	Company Name	Suprema Inc.		
	Address	16F Parkview Office Tower, Jeongja-dong, Bundang-gu, Seongnam, Gyeonggi, 463-863 Korea		
Product	Product type	RealScan-F		
	Model	RSF	Manufacturer	Suprema Inc.
	Serial No.	NONE	Country of origin	KOREA
Other	Receipt Date	28-Jan-10	Receipt Number	ESTC-10-00207
	Issued Date	2-Feb-10	Tested Date	2010-1-28~ 2010-1-30
Test Result	PASS			
Standard	EMI Standard		EMS Standard	
	EN 55022:2006+A1:2007 Class A EN 61000-3-2:2006 EN 61000-3-3:1995 +A1:2001+A2:2005		EN 55024:1998 +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	
Tested by	H.H. Lee / Senior Engineer 			
Approved by	J.M. Yang / Engineering Manager 			
<div>ESTECH CO., LTD</div> <div>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</div>				
* Note				
<div>- This is certified that the above mentioned products have been tested for the sample provided by client.</div> <div>- No part of this document may not be duplicated or reproduced by any means without the express written permission of Estech Co., Ltd.</div>				



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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. : 97-1, Hoeok-ri, Majang-myun, Ichion-city, Kyonggi-do, South 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-F
- " Model Number : RSF
- " Serial Number : NONE
- " Manufacturer : Suprema Inc.
- " Country of origin : KOREA
- " Power Rating : Input : 100-240 VAC~1.5 A, 50/60 Hz, Output :12 V \equiv 2.5 A
- " X-tail : 30.0 MHz, 18.432 MHz

2.2 General descriptions of EUT

- Scans various fingerprint images (1, 2, or 4 flats or 1 roll and palm).
- High-quality image scanning regardless of states of finger.
- Automatically segments when scanning flats, and detects slippage when scanning rolls.
- Prevents external light, halo effect, and ghost images.
- Full compliance with IDENT, US-VISIT, and DHS standards.
- User Interface
 - ① Buttons can be used to make scanning easier.
 - ② Scanning progress can be seen on the display.
 - ③ Emits beeps and voice instruction messages through the built-in speaker.
- Detachable cover protects the fingerprint scanning area.
- USB 2.0 transmits data and supplies power.
- For use only with UL Listed I.T.E computer
- Input Power : 12VDC / 2.5A



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 Notebook computer usb port.
- 4. Install scanning program in the Notebook computer.
- 5. Put hand to RealScan-F and check action availability from Notebook computer.

3.2 Cable Connecting

Start Equipment		End Equipment		Cable		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
RealScan-F	USB	Notebook Computer	USB	1.83	Shielded	
RealScan-F	line	FOOT S/W	line	2.0	Shielded	
RealScan-F	power	Adapter	-	1.5	Unshielded	
Notebook Computer	USB	PRINTER	USB	1.5	Shielded	
Notebook Computer	USB	MOUSE	USB	1.8	Shielded	
Notebook Computer	power	Adapter	-	2.0	Unshielded	

3.3 EUT Configurations

Equipment Name	Model Name	S/N	Manufacturer	Remark (CE ID)
RealScan-F	RSF	NONE	Suprema Inc.	E.U.T
ADAPTER	JPW128KA1200F03	NONE	BridgePower Corp.	
ADAPTER	Series PPP014L-SA	9215517102	Suzhou Li Shin Electronic Co., Ltd.	
Notebook Computer	Pavilion dv5	CNF9100JMW	Hewlett-Packard	
MOUSE	M-BJ58	NONE	Logitech	
PRINTER	K10299	NONE	Canon Inc.	
FOOT S/W	JUNIOR	NONE	LINEMASTER SWITCH CORP.	



3.4 Performance Criteria for EUT

Criterion	Monitoring method	Remark
A	Normal performance within the specification limits.	
B	Temporary degradation or loss of function or performance which is self-recoverable.	
C	Temporary degradation or loss of function or performance which requires operator intervention or system reset.	



4. Electromagnetic Interference Test

4.1 Measurement of radiated emission

Electric Field strength was measured in accordance with EN 55022:2006+A1:2007 Class A. The test setup was made according to EN 55022:2006+A1:2007 Class A on an open test site, which allows a 10 m distance measurement. The height of this table was 0.8 m. 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 setup.

4.1.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESPI	Rohde & Schwarz	100005	15-Jan-11
Spectrum Analyzer	R3273	ADVANTEST	110600592	4-Jun-10
Logbicon Antenna	VULB 9160	Schwarzbeck	3142	13-May-10
Amplifier	8447F	HP	2805A02972	24-Jun-10

4.1.2 Environmental conditions

Section	Temperature (°C)	Humidity (%)
Radiated emission	5	40
Test Place	Open site : 10 m	



4.1.3 Test data

Test Date 28-Jan-10

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	
43.95	10.70	V	1.0	11.81	0.96	40.0	23.46	16.54
76.17	10.00	H	4.0	9.43	1.33	40.0	20.76	19.24
110.54	13.10	H	4.0	10.35	1.61	40.0	25.06	14.94
143.98	14.40	V	1.0	12.61	2.00	40.0	29.00	11.00
196.63	18.80	V	1.0	10.78	2.31	40.0	31.90	8.10
229.02	10.00	H	4.0	10.47	2.52	40.0	22.99	17.01
236.94	11.80	H	4.0	10.80	2.59	47.0	25.19	21.81
276.72	11.60	V	1.0	12.17	2.99	47.0	26.76	20.24
344.04	10.10	H	3.7	13.99	3.59	47.0	27.68	19.32
393.21	11.40	H	3.4	14.95	3.85	47.0	30.20	16.80
416.15	15.70	V	1.0	15.46	3.98	47.0	35.14	11.86
442.35	8.70	H	2.6	16.43	4.42	47.0	29.55	17.45
721.78	3.00	H	1.6	21.40	6.57	47.0	30.97	16.03
904.02	1.00	H	1.0	23.46	7.77	47.0	32.23	14.77
Remark	*Result Value=Reading+Correction Factor *Correction Factor=Antenna factor+Cable loss							



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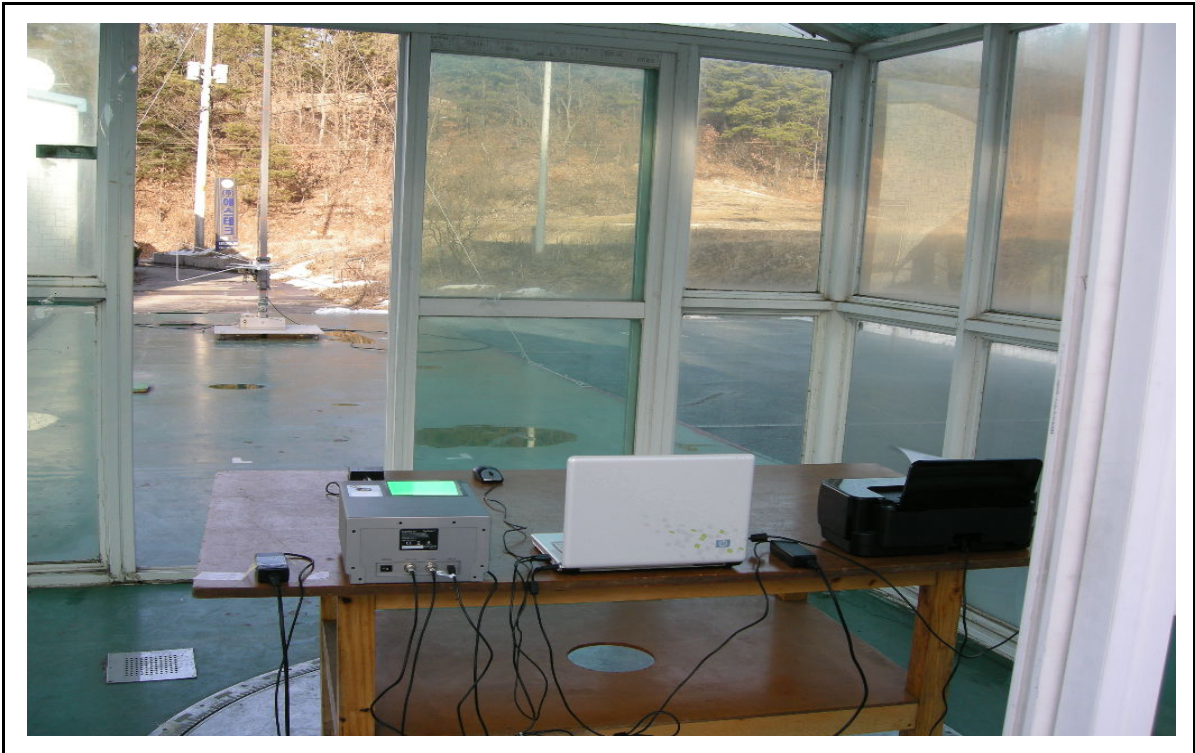
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◆ Setup for Radiated Test

[Front]



[Rear]





4.2 Conducted emission test

The continuous disturbance voltage of AC Mains was measured in accordance to EN 55022:2006+A1:2007 Class A. The test setup was made according to EN 55022:2006+A1:2007 Class A in a shielded Room. The EUT was placed on a non-conductive table at least 0.8 m above the ground plane. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. 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 1.0 m. 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	Rohde & Schwarz	838979/010	21-Feb-10
TEST Receiver	ESPI7	Rohde & Schwarz	100185	24-Aug-10
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	9-Sep-10



4.2.2 Environmental conditions

Section	Temperature (°C)	Humidity (%)
Conducted emission	20	34
Test Place	shielded Room	

4.2.3 Test data

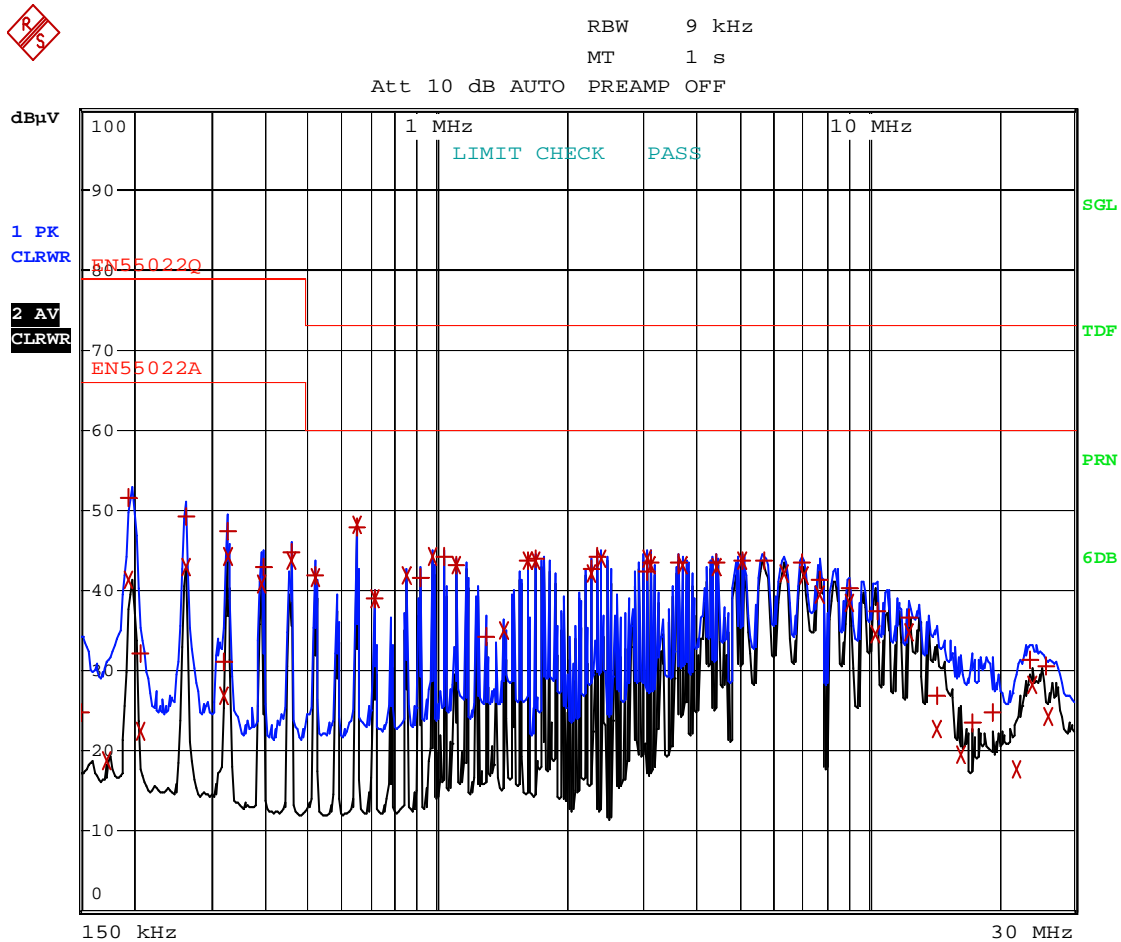
Test Date 28-Jan-10

Frequency (MHz)	Correction Factor (dB)		Line (H/N)	Quasi-peak Value (dBuV)			Average Value (dBuV)		
	LISN	Cable etc.		Limit	Reading	Result	Limit	Reading	Result
0.19	0.10	0.23	H	79.0	51.50	51.83	66.0	41.34	41.67
0.20	0.09	0.23	N	79.0	32.98	33.30	66.0	22.95	23.27
0.26	0.10	0.23	H	79.0	49.27	49.60	66.0	42.91	43.24
0.33	0.10	0.25	H	79.0	47.47	47.82	66.0	44.33	44.68
0.39	0.09	0.29	N	79.0	43.09	43.48	66.0	40.57	40.96
0.46	0.10	0.33	H	79.0	44.66	45.09	66.0	43.76	44.19
0.52	0.10	0.36	H	73.0	41.96	42.42	60.0	41.63	42.09
0.65	0.11	0.38	H	73.0	48.02	48.51	60.0	48.12	48.61
1.05	0.11	0.51	N	73.0	44.57	45.19	60.0	44.53	45.15
1.70	0.14	0.45	H	73.0	43.86	44.45	60.0	43.80	44.39
2.35	0.16	0.44	H	73.0	44.10	44.71	60.0	43.96	44.57
3.13	0.20	0.50	H	73.0	43.43	44.12	60.0	43.22	43.91
Remark	H : Hot Line, N : Neutral Line Correction factor=LISN factor + Cable loss								



4.2.4 Spectral Diagram

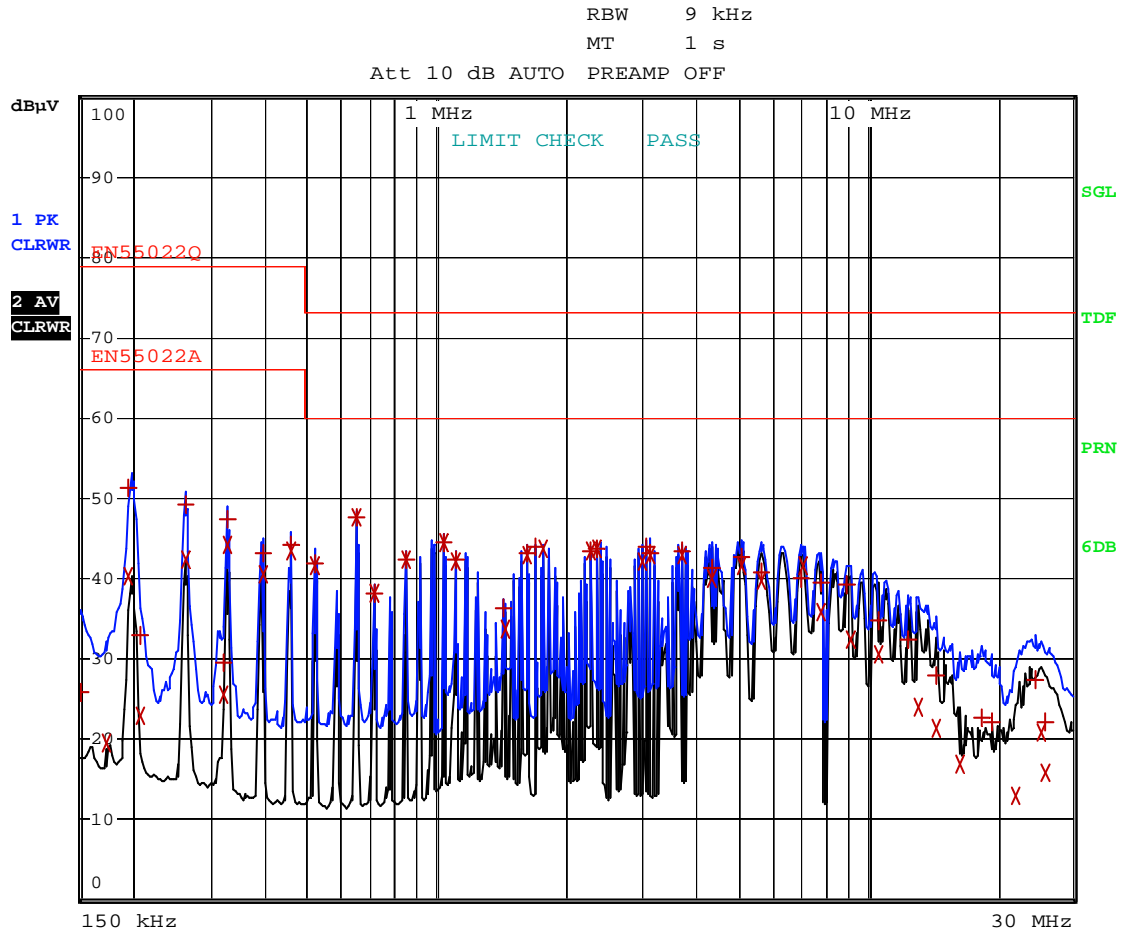
◆ Hot Line



Comment: RSF HOT
Date: 28.JAN.2010 14:30:04



◆ - Neutral Line



Comment: RSF NEUTRAL

Date: 28.JAN.2010 14:25:28



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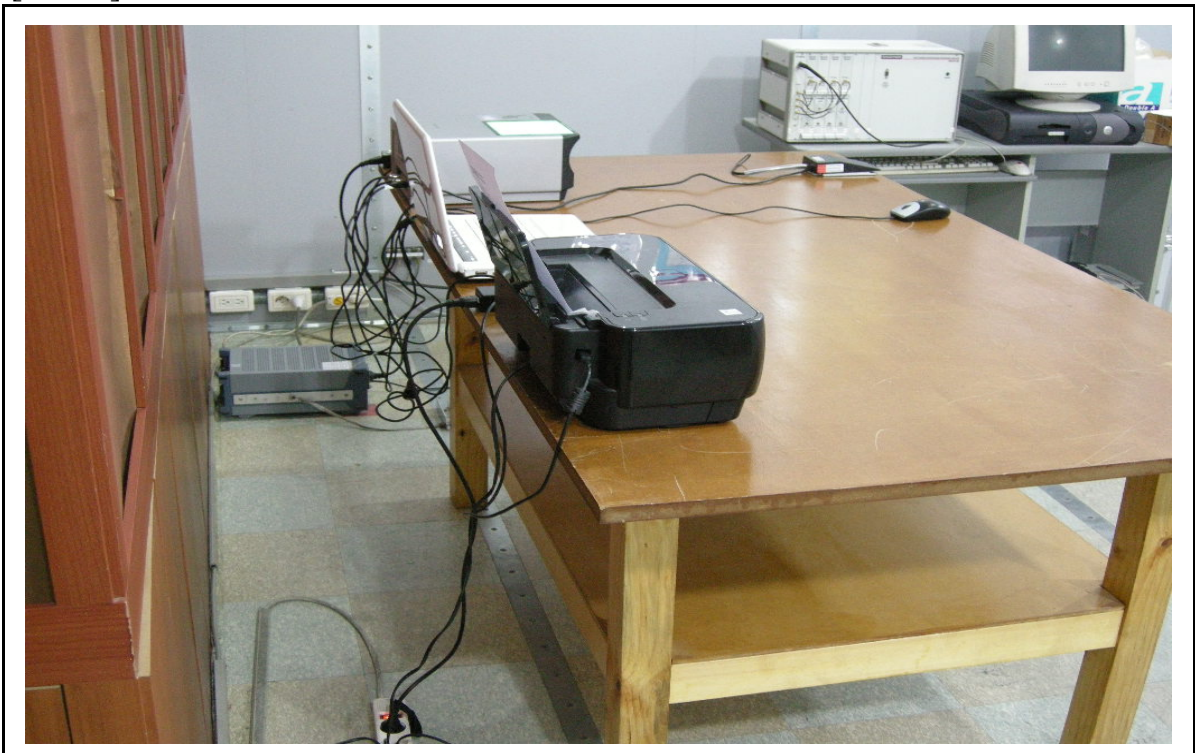
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◆ Setup for Conducted Test : 0.15 ~ 30 MHz

[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 EN61000-3-2:2006

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 EN 61000-3-2.

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	HAEFFLY	04819-11	1-Dec-10
Upgrade test system	PHF X	HAEFFLY	151336	-

4.3.2 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
22	38	101.1

◆ Setup Figure



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Test Date : 30-Jan-10

measuring protocol printed at 30. January 2010 12:34:46

Measuring logfile c:\PHP_060419\00207-ha.phpf
is dated 30. January 2010 12:34:35

Test data:

Name: HONG HEE LEE
Department: EMC Lab
Company: ESTECH Co., Ltd.
Device: RealScan-F
Manufacturer: Suprema Inc.
Type: RSP
00014

SR00008
FW47628

PHP Version 1.25 was used
The measuring setup consists of
a PHP, SN 07370412, Rev. 3.106
according to the standard: EN61000-4-7:2002
Compliance was tested against EN61000-3-2:2000 limits
The smoothing filter was switched on
The measuring ranges 250.0 V, scaling 1.0 for voltage
and 2.5 A, scaling 1.0 for current were used.
Class A was chosen
Measuring time was : 00:02:30

	Voltage check:	Phase 1	Phase 2	Phase
3	All voltage harmonics within the limit	: ok		
	Voltage +/-2% of nominal value	: ok		
	Frequency within +/-0.5%	: ok		

Current check:
All current harmonics within the limit : ok
All current harmonics within 150% of limit : ok

Global values from chosen frame at 00:00:00 before end of measuring (informati
ve):

	Phase 1
U -	230.2722 V
I -	0.1249 A
P -	10.5973 W
PF -	0.3665
f -	49.9971 Hz

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Protocol from 30. January 2010 12:34:57

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Measuring logfile c:\PHP_060419\00207-ha.phf
is dated 30. January 2010 12:34:35

Phase 1

n	I _{aver}	I _{max}	I _{all}	I/I _{lim} ,%	Frane	U _{max}
0	0.0022	0.0023				0.0350
1	0.0557	0.0557		0.0000	0	230.2597
2	0.0010	0.0011		0.0000	0	0.0395
3	0.0447	0.0447		1.9454	714	0.0195
4	0.0010	0.0010		0.0000	0	0.0129
5	0.0435	0.0435		3.8166	714	0.0280
6	0.0009	0.0010		0.0000	0	0.0098
7	0.0416	0.0416		5.4054	714	0.0100
8	0.0009	0.0009		0.0000	0	0.0055
9	0.0392	0.0392		9.8124	714	0.0089
10	0.0008	0.0008		0.0000	0	0.0053
11	0.0364	0.0364		11.0290	25	0.0100
12	0.0007	0.0008		0.0000	0	0.0074
13	0.0332	0.0332		15.8121	25	0.0062
14	0.0006	0.0006		0.0000	0	0.0047
15	0.0297	0.0298		19.8403	25	0.0131
16	0.0005	0.0006		0.0000	0	0.0067
17	0.0261	0.0261		19.7422	25	0.0069
18	0.0004	0.0005		0.0000	0	0.0032
19	0.0224	0.0224		18.9523	25	0.0063
20	0.0004	0.0004		0.0000	0	0.0041
21	0.0187	0.0188		17.5332	24	0.0127
22	0.0003	0.0004		0.0000	0	0.0120
23	0.0153	0.0153		15.6855	25	0.0086
24	0.0003	0.0003		0.0000	0	0.0104
25	0.0120	0.0121		13.4517	0	0.0050
26	0.0003	0.0004		0.0000	0	0.0041
27	0.0091	0.0092		11.0757	0	0.0042
28	0.0003	0.0004		0.0000	0	0.0059
29	0.0067	0.0068		8.7497	0	0.0044
30	0.0004	0.0004		0.0000	0	0.0053
31	0.0048	0.0049		0.0000	0	0.0050
32	0.0004	0.0004		0.0000	0	0.0038
33	0.0037	0.0038		0.0000	0	0.0068
34	0.0004	0.0004		0.0000	0	0.0039
35	0.0034	0.0034		0.0000	0	0.0046
36	0.0003	0.0004		0.0000	0	0.0131
37	0.0035	0.0035		0.0000	0	0.0102
38	0.0003	0.0003		0.0000	0	0.0073
39	0.0037	0.0037		0.0000	0	0.0028
40	0.0003	0.0003		0.0000	0	0.0052

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 EN 61000-3-3:1995 +A1:2001+A2:2005

4.4.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Test system	PHF555	HAEFFLY	04819-11	1-Dec-10
Upgrade test system	PHF X	HAEFFLY	151336	-

4.4.2 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
22	38	101.1

◆ Setup Figure





4.4.3 Test data

Test Date : 30-Jan-10

measuring protocol printed at 30. January 2010 14:30:19

Measuring logfile c:\PHP 060419\00207-f1.phf
is dated 30. January 2010 14:36:05

Name: HONG HEE LEE
Department: EMC Lab
Company: ESTECH Co., Ltd.
Device: RealScan-F
Manufacturer: Suprema Inc.
Type: RSF 00014

SR00008
FW47628

PHP Version 1.25 was used
The measuring setup consists of
a PHP, SN 07370412, Rev. 3.106 according to the standard: EN61000-4-15
Compliance was tested against EN61000-3-3+A1 B2 limits
The measuring ranges 250.0 V, scaling 1.0 for voltage
and 2.5 A, scaling 1.0 for current were used.
Short time : 00:10:00
Number of periods : 12

dmax < 4.0 :

Phase 1 ok
Values from chosen frame at 00:00:00 before end of long time interval (informa
tive):

	Phase 1
Pst -	0.0000
Plt -	0.0000
dmax -	0.0360 %
dc -	0.0000 %
U -	230.2365 V
I -	0.1229 A
P -	10.5066 W
PF -	0.3712
f -	49.9971 Hz

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Protocol from 30. January 2010 14:30:27

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Measuring logfile c:\PHF_060419\00207-f1.phf
is dated 30. January 2010 14:36:05

n	Est 1

1	0.0341
2	0.0350
3	0.0362
4	0.0341
5	0.0362
6	0.0344
7	0.0351
8	0.0354
9	0.0356
10	0.0356
11	0.0359
12	0.0360



5. Electromagnetic Susceptibility Test

5.1 Electrostatic Discharge test

5.1.1 Test Standard

- Standard : EN 61000-4-2:1995 +A1:1998 +A2:2001
- Performance appraisal standard : B
- Energy storage capacitance : 150 pF ($\pm 10\%$)
- Discharge resistance : 330 Ω ($\pm 10\%$)
- Charging resistance : 50 M Ω (50 ~100 M Ω)
- Tolerance of the output voltage indication : $\pm 5\%$
- Polarity of the output voltage : Positive(+) and Negative(-)
- Holding time : at least 5 s
- Discharge, Mode of operation : Single discharge
- Interval discharge time : At least 1 s
- 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 Generator	NSG 438	SCHAFFNER	601	20-Jun-10



5.1.3 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
21	40	100.9

5.1.4 Test data

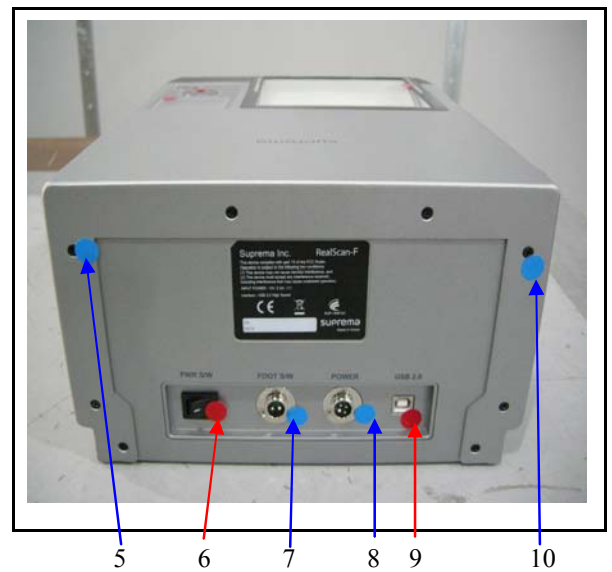
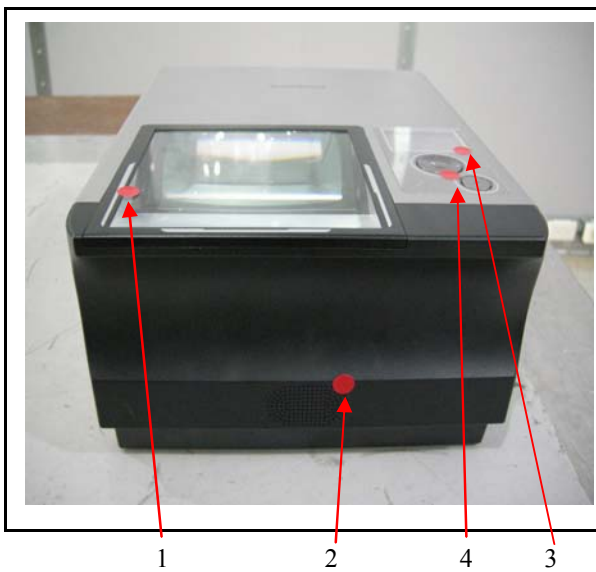
Test Date 28-Jan-10

Point	Test Method	Test Voltage (+/-)	Criterion	Result	Remark
HCP	Horizontal Coupling	2,4 kV	B	A	
VCP	Vertical Coupling	2,4 kV	B	A	
1	Air discharge	2,4,8 kV	B	A	
2	Air discharge	2,4,8 kV	B	A	
3	Air discharge	2,4,8 kV	B	A	
4	Air discharge	2,4,8 kV	B	A	
5	Contact discharge	2,4 kV	B	A	
6	Air discharge	2,4,8 kV	B	A	
7	Contact discharge	2,4 kV	B	A	
8	Contact discharge	2,4 kV	B	A	
9	Air discharge	2,4,8 kV	B	A	
10	Contact discharge	2,4 kV	B	A	
11	Air discharge	2,4,8 kV	B	A	
12	Air discharge	2,4,8 kV	B	A	
Reference	Line color : RED-Air BLUE-Contact				

◆ Setup Figure



◆ Test Point





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11

1. The top scan view part
3. The top direction button part
5. The rear left screw part
7. The rear foot switch port part
9. The rear USB port part
11. The left cover part

HCP: Indirect Discharge



12

2. The front speaker part
4. The top shoot button part
6. The rear power switch part
8. The rear power port part
10. The rear right screw part
12. The right cover part

VCP : Indirect Discharge



5.2 Radiated Electromagnetic Fields test

5.2.1 Test Standard

- Standard : EN 61000-4-3:2006+A1:2008
- Criterion standard : A
- Frequency Range : 80 MHz ~ 1000 MHz
- 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 : 3 m
- Modulation : AM 80 % with 1 kHz sine wave
- Dwell time : 3 s
- Field Strength: 3 V/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	10-Jun-10
Signal Generator	8648C	HP	3623A03549	6-Jul-10
Power Sensor	URV5-Z2	Rohde & Schwarz	100592	15-Oct-10
Power Meter	NRVD	Rohde & Schwarz	DE25524	15-Oct-10
System Interface	SI-300-2	TDK	41610	N/A



5.2.3 Environmental Conditions

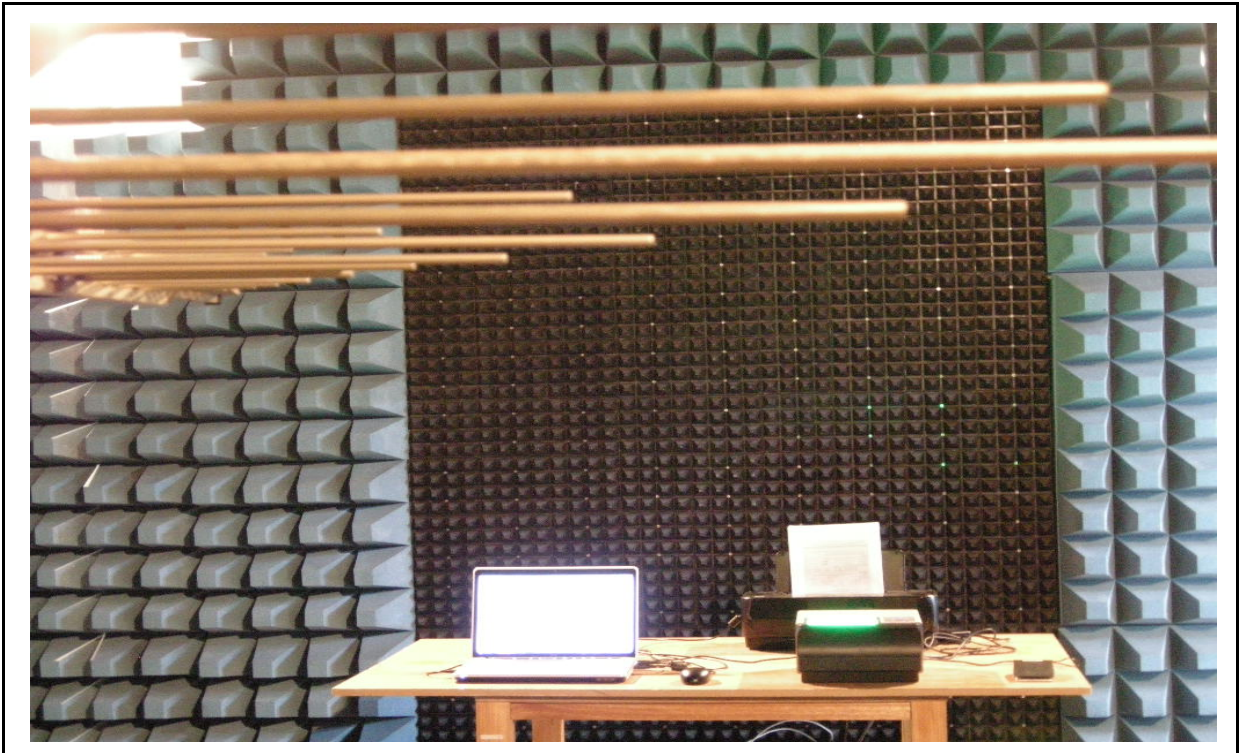
Temperature (°C)	Humidity (%)	Pressure (kPa)
20	34	101.1

5.2.4 Test data

Test Date : 28-Jan-10

Range of Frequency (MHz)	Position	Polarity	Electromagnetic Intensity (V/m)	Criterion	Result
80 MHz ~ 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			

◆ 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 : ± 1 kV , other port : 0.5 kV
- Polarity : Positive(+), Negative(-)
- Repetition Frequency : 5 kHz
- Duration Time : 60 s

5.3.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
BEST EMC Instrument	BEST EMC V2.7	SCHAFFNER	200119-033SC	5-Nov-10

5.3.3 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
19	32	101.4

5.3.4 Test data

Test Date : 29-Jan-10

Tested Point		Test Voltage	Duration Time (s)	Criterion	Result	Remark
Input AC	L1	±1 kV	60 s	B	A	
	L2	±1 kV	60 s	B	A	
	PE	±1 kV	60 s	B	A	
	L1 + L2	±1 kV	60 s	B	A	
	L1 + PE	±1 kV	60 s	B	A	
	L2 + PE	±1 kV	60 s	B	A	
	L1 + L2 + PE	±1 kV	60 s	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 : ± 2 kV, line-line : ± 1 kV,
Telecom. & signal : Line-earth : ± 1 kV, DC port : ± 0.5 kV
- Polarity : Positive(+), Negative(-)
- Repetition rate: max 60 s.
- 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
BEST EMC Instrument	BEST EMC V2.7	SCHAFFNER	200119-033SC	5-Nov-10

5.4.3 Environmental Conditions

Temperature ($^\circ\text{C}$)	Humidity (%)	Pressure (kPa)
18	36	101.4

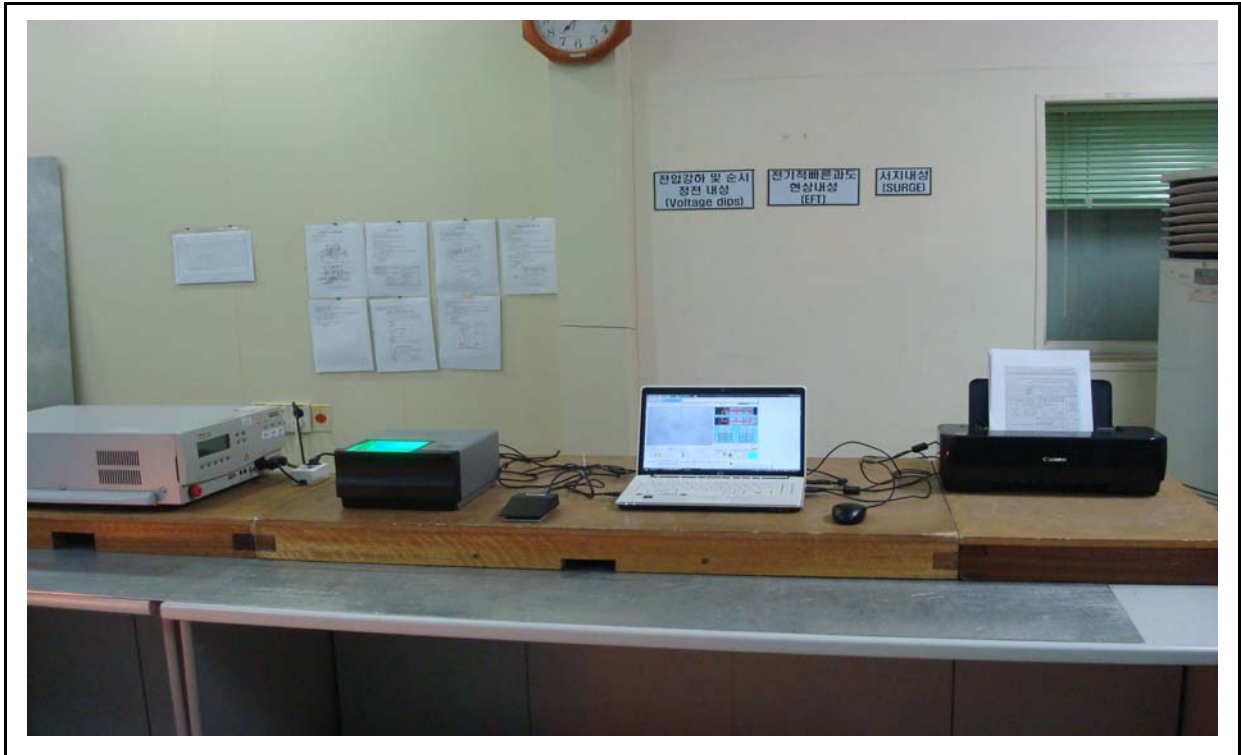


5.4.4 Test data

Test Date : 29-Jan-10

Tested Point		Test Voltage	Criterion	Result	Remark
Input AC	L1 - L2	±1 kV	B	A	
	L1 - PE	±2 kV	B	A	
	L2 - PE	±2 kV	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 : 3.0 V
- Modulation : AM 80 % with 1 kHz sine wave
- Dwell time : 3 s
- 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-10
Signal Generator	8648C	HP	3623A03549	6-Jul-10
Power Sensor	URV5-Z2	Rohde & Schwarz	100592	15-Oct-10
Power Meter	NRVD	Rohde & Schwarz	DE25524	15-Oct-10
ATTENUATOR	50FH-006-300-2	Amplifier Research	NONE	22-May-10
System Interface	SI-300-2	TDK	41610	N/A
CDN	CDN M106	Teseq GmbH	27445	9-Jul-10

5.5.3 Environmental Conditions

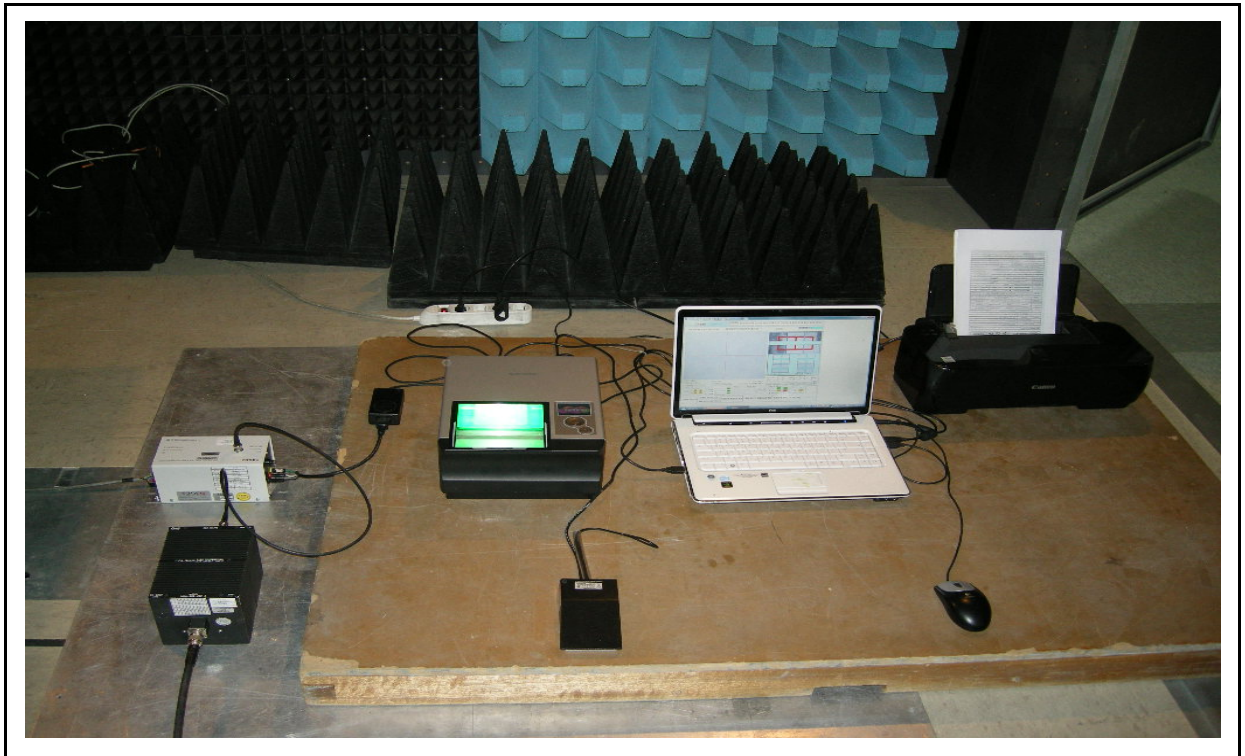
Temperature (°C)	Humidity (%)	Pressure (kPa)
20	32	101.1

5.5.4 Test data

Test Date : 29-Jan-10

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

◆ Setup Figure





5.6 Voltage Dips and Interruptions test

5.6.1 Test Standard

- Standard : EN 61000-4-11:2004
- Performance appraisal standard and Voltage Reduction
 - >95 % 250 cycles : C , >95 % 0.5cycles : B, 30 % 25 cycles : C
- Number of pulses : 3 at each level
- Recovery time between pulses : 10 s
- We tested both lower voltage (100 Va.c.) and higher voltage (240 Va.c.).

5.6.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Test system	PHF555	HAEFFLY	04819-11	1-Dec-10
Upgrade test system	PHF X	HAEFFLY	151336	-

5.6.3 Environmental Conditions

Temperature (°C)	Humidity (%)	Pressure (kPa)
22	38	101.1

5.6.4 Test data

Test Date : 29-Jan-10

Voltage Reduction	Duration Cycles	Criterion	Result	Remark
> 95%	0.5	B	A	
30%	25	C	A	
> 95%	250	C	C	
Reference	We tested both lower voltage (100 Va.c.) and higher voltage (240 Va.c.).			

◆ Setup Figure





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Laboratory*

6. EUT Photographs

[Front]



[Rear]





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[Adapter]



[Adapter Level]





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[In side]

