ELECTROMAGNETIC COMPLIANCE TEST REPORT

For

16 Port Dump Gigabit switch&16 Port Web-Smart Gigabit switch

Model: RGS-1016WS, 524087, KN-S1016GM

Brand Name: Rapidmax

Report No.: AGC10430912GZ06-1E1

Date of Issue: Jan.14, 2010

Prepared For

Rapidmax Technology Corporation

3F, 531 Chung-Cheng Rd. Hsin-Tien, Taipei231, Taiwan, R.O.C.

TEL: 886-2-2219-6000

FAX: 886-2-2218-8833

Prepared By

Attestation of Global Compliance Co., Ltd.

2F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei,

Xixiang, Baoan District, Shenzhen

TEL: 86-755-2908 1966

FAX: 86-755-2600 8484

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY 3
2. SYSTEM DESCRIPTION 4
3. PRODUCT INFORMATION 5
4. SUPPORT EQUIPMENT 6
5. TEST FACILITY 7
6. EN 55022 LINE CONDUCTED EMISSION TEST 8
6.1. TEST EQUIPMENT OF CONDUCTED EMISSION TEST 8
6.2. LIMITS OF LINE CONDUCTED EMISSION TEST 8
6.3. BLOCK DIAGRAM OF TEST SETUP 8
6.4. PROCEDURE OF LINE CONDUCTED EMISSION TEST 9
6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST 10
7. EN 55022 RADIATED EMISSION TEST 12
7.1. TEST EQUIPMENT OF RADIATED EMISSION TEST 12
7.2. LIMITS OF RADIATED DISTURBANCES AT 10M DISTANCES 12
7.3. BLOCK DIAGRAM OF TEST SETUP 12
7.4. PROCEDURE OF RADIATED EMISSION TEST 13
7.5. TEST RESULT OF RADIATED EMISSION TEST 14
8. EN 61000-3-2 POWER HARMONICS TEST 16
8.1. BLOCK DIAGRAM OF TEST SETUP 16
8.2. LIMITS OF HARMONIC CURRENT 17
8.3. RESULT 17
9. EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST 19
9.1. TEST EQUIPMENT OF VOLTAGE FLUCTUATION / FLICKER TEST 19
9.2. BLOCK DIAGRAM OF TEST SETUP 19
9.3. RESULT 19
10. IEC 61000-4-2 ESD IMMUNITY TEST 21
10.1. TEST EQUIPMENT OF ESD TEST 21
10.2. BLOCK DIAGRAM OF TEST SETUP 21
10.3. TEST PROCEDURE 21
10.4. PERFORMANCE & RESULT 22
11. IEC 61000-4-3 TEST 23
11.1. TEST EQUIPMENT 23
11.2. BLOCK DIAGRAM OF TEST SETUP 23
11.3. TEST PROCEDURE 24

11.4. PERFORMANCE & RESULT 25
12. IEC 61000-4-4 TEST 26
12.1. TEST EQUIPMENT 26
12.2. BLOCK DIAGRAM OF TEST SETUP 26
12.3. TEST PROCEDURE 27
12.4. PERFORMANCE & RESULT 27
13. IEC 61000-4-5 SURGE IMMUNITY TEST 28
13.1. TEST EQUIPMENT OF SURGE TEST 28
13.2. BLOCK DIAGRAM OF TEST SETUP 28
13.3. TEST PROCEDURE 29
13.4. PERFORMANCE & RESULT 29
14. IEC 61000-4-6 TEST 30
14.1. TEST EQUIPMENT 30
14.2. BLOCK DIAGRAM OF TEST SETUP 30
14.3. TEST PROCEDURE 31
14.4. PERFORMANCE & RESULT 31
15. IEC 61000-4-11 TEST 32
15.1. TEST EQUIPMENT 32
15.2. BLOCK DIAGRAM OF TEST SETUP 32
15.3. TEST PROCEDURE 33
15.4. PERFORMANCE 33
APPENDIX 1 34
PHOTOGRAPHS OF TEST SETUP 34
APPENDIX 2 35
PHOTOGRAPHS OF EUT 35

1. VERIFICATION OF CONFORMITY

Equipment Under Test:	16 Port Dump Gigabit switch &16 Port Web-Smart Gigabit switch
Brand Name:	Rapidmax
Model:	RGS-1016WS, 524087, KN-S1016GM
Difference:	Only model name is different.
Applicant:	Rapidmax Technology Corporation
	3F, 531 Chung-Cheng Rd. Hsin-Tien, Taipei231, Taiwan, R.O.C.
Manufacturer:	Shenzhen Kingnet Electronic Co., Ltd
	5/F, Block 4, Science & Technology Industrial Park of Private Enterprise Pingshan, Xili Town, Nanshan District, Shenzhen
Type of Test:	EMC Directive 2004/108/EC for CE Marking
Technical Standards:	EN 55022: 2006 EN 61000-3-2: 2006 EN 61000-3-3: 2008 EN 55024: 1998 + A1: 2001 + A2: 2003 (IEC 61000-4-2: 2008; IEC 61000-4-3: 2008; IEC 61000-4-4: 2004; IEC 61000-4-5: 2005; IEC 61000-4-6: 2008; IEC 61000-4-11: 2004)
File Number:	AGC10430912GZ06-1E1
Date of test:	Jan.06~ Jan.14, 2010
Deviation:	None
Condition of Test Sample:	Normal

The above equipment was tested by Attestation Of Global Compliance Co., Ltd. for compliance with the requirements set forth in EMC Directive 2004/108/EC and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Checked By _____

Jekey Zhang Jan.14, 2010

Authorized By _____

King Zhang Jan.14, 2010

2. SYSTEM DESCRIPTION

EUT Test Procedure:

1. Connect EUT and peripheral devices (if need)
2. Power on the EUT, The EUT begins to work.
3. Make sure the EUT works normally during the test.

3. PRODUCT INFORMATION

Housing Type: Metal

EUT Rating Voltage: AC 100-240V 50Hz/60Hz

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
AC INPUT PORT	1	1	1
DC OUTPUT PORT	1	1	1

4. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

***Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.*

***Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.*

5. TEST FACILITY

Location:	F1, Bldg.A, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, 518057 Shenzhen, P.R. China
Description:	There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.
Site Filing:	The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.
Instrument Tolerance:	All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements that meet industry regulatory agency and accreditation agency requirement.

6. EN 55022 LINE CONDUCTED EMISSION TEST

6.1. TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	N/A	06/29/2009	06/28/2010
LISN	ETS	3816	N/A	06/29/2009	06/28/2010

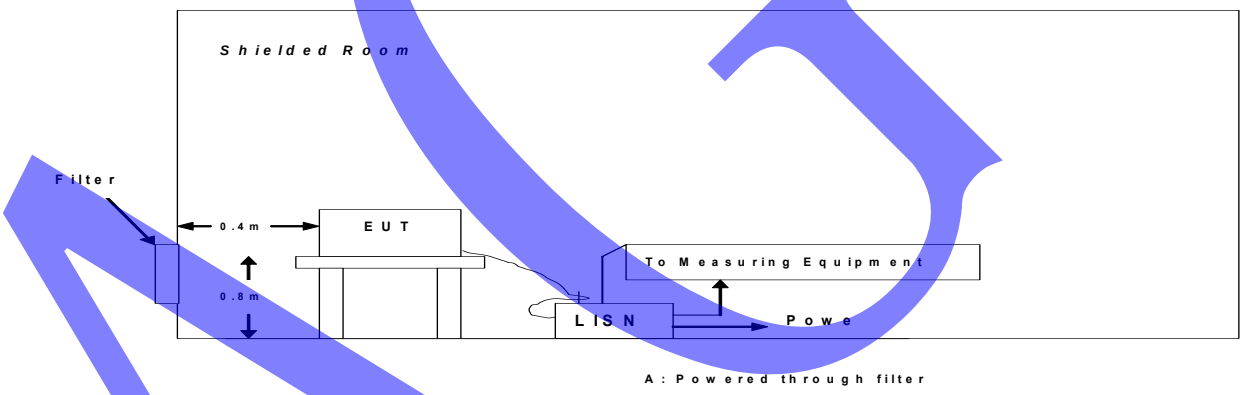
6.2. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

***Note:** 1. The lower limit shall apply at the transition frequency.*

2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

6.3. BLOCK DIAGRAM OF TEST SETUP



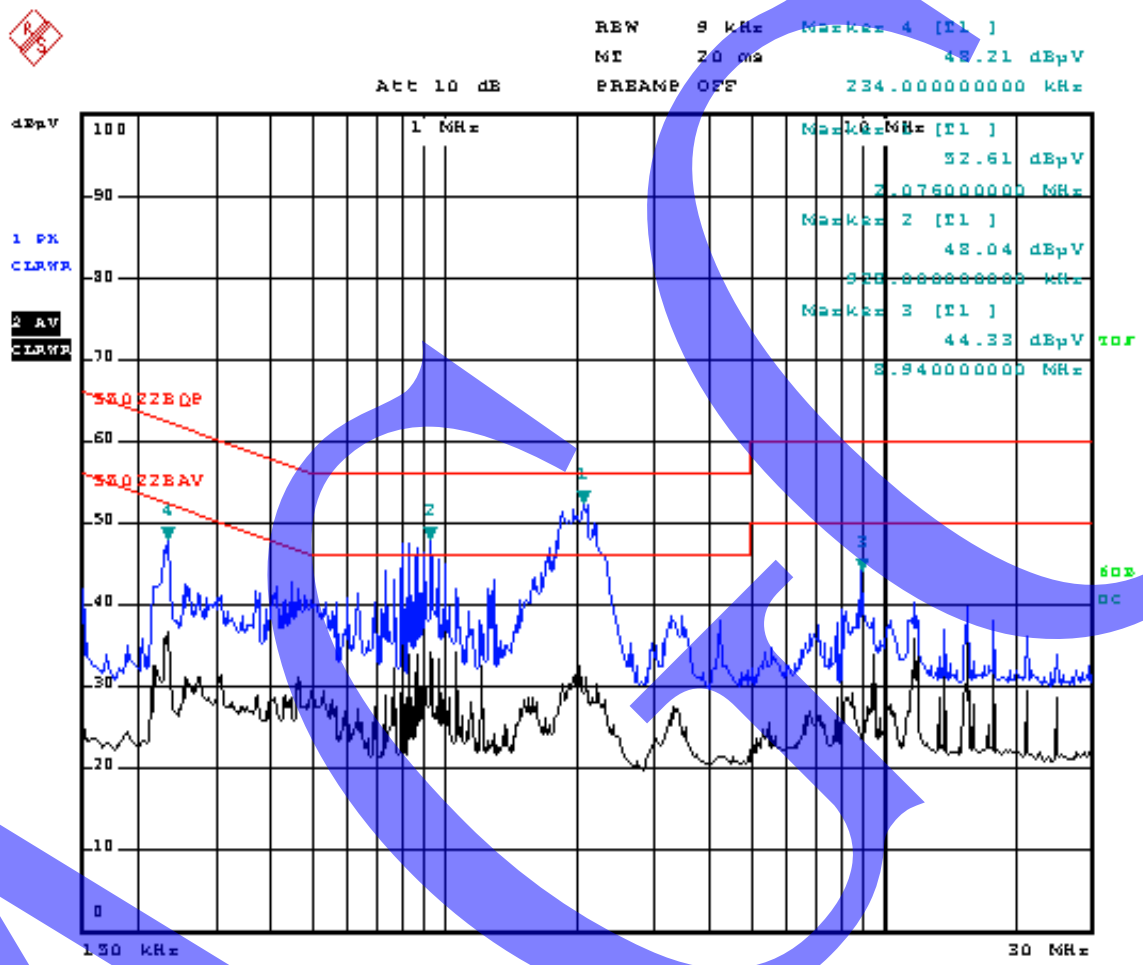
6.4. PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per EN55022.
3) All I/O cables were positioned to simulate typical actual usage as per EN55022.
4) The EUT received AC100-240V/50Hz/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5) All support equipments received power from a second LISN supplying power of AC 230V/50Hz, if any.
6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
8) During the above scans, the emissions were maximized by cable manipulation.
9) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
10) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

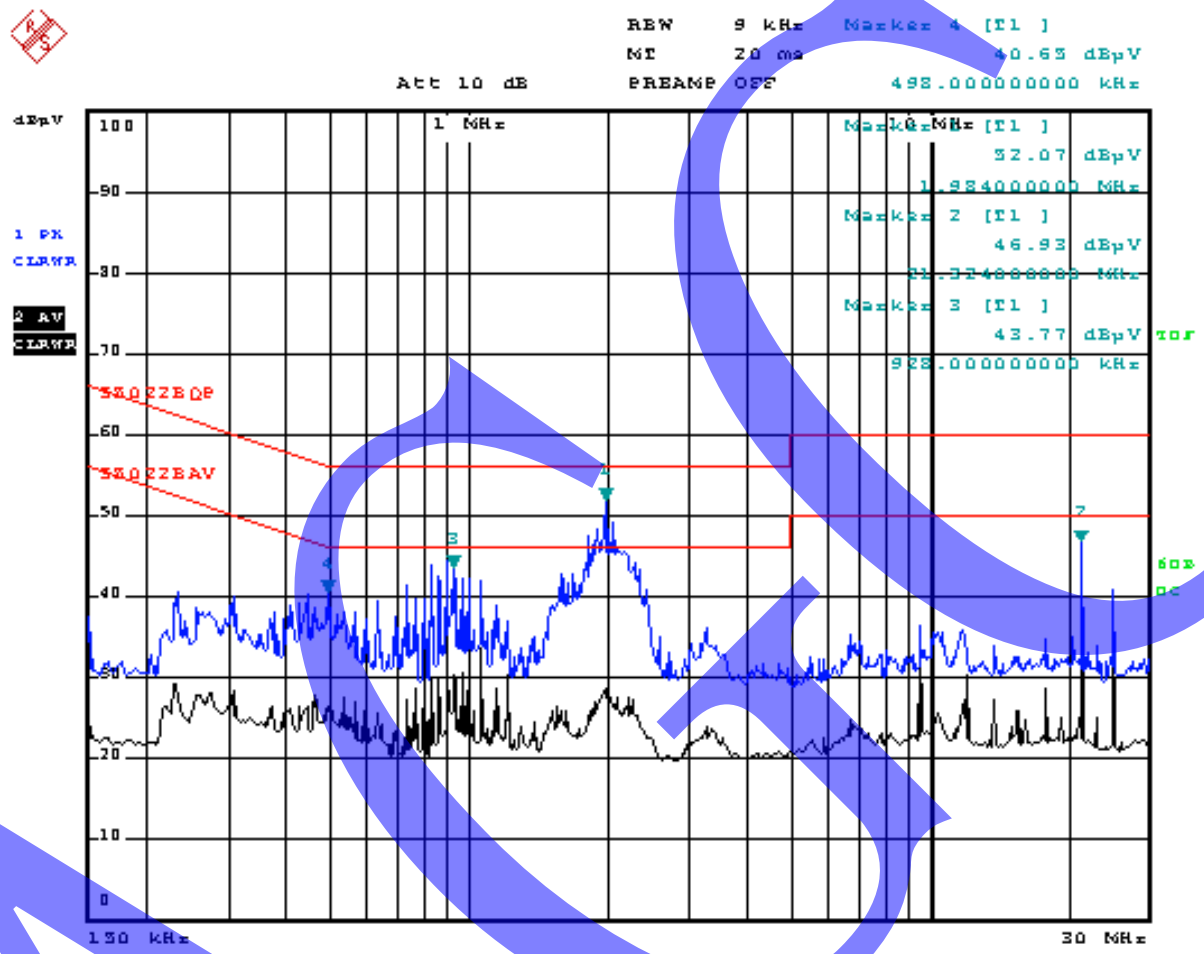
The test data of the worst case condition(s) was reported on the Summary Data page.

6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Test Result of Line Conducted Emission Test-Neutral Line



Test Result of Line Conducted Emission Test-Line Line



7. EN 55022 RADIATED EMISSION TEST

7.1. TEST EQUIPMENT OF RADIATED EMISSION TEST

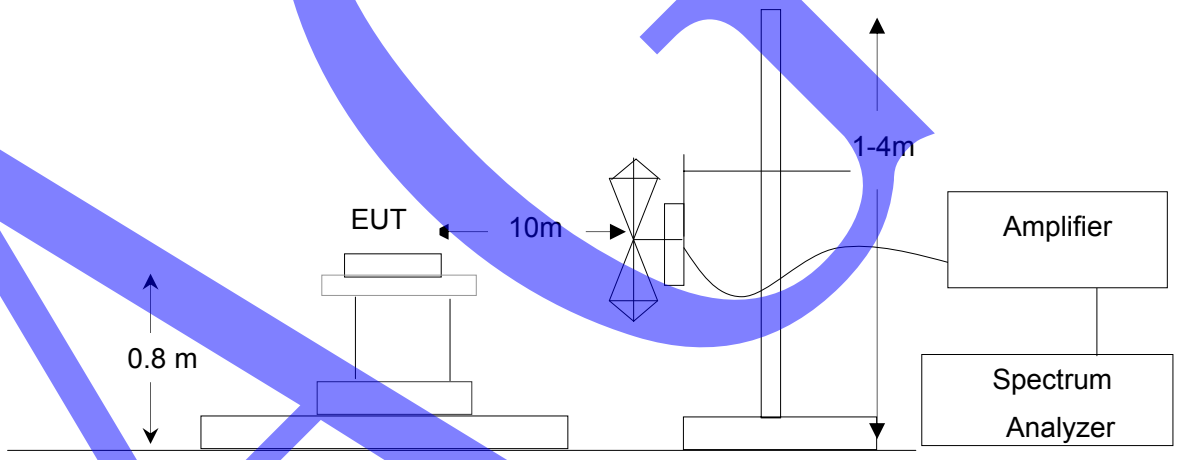
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4443A	N/A	06/29/2009	06/28/2010
Biconilog Antenna	ETS	3142C	N/A	06/29/2009	06/28/2010
Multi_device Controller	ETS	2090	N/A	06/29/2009	06/28/2010

7.2. LIMITS OF RADIATED DISTURBANCES AT 10M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	10	30.00
230-1000	10	37.00

***Note:** The lower limit shall apply at the transition frequency.*

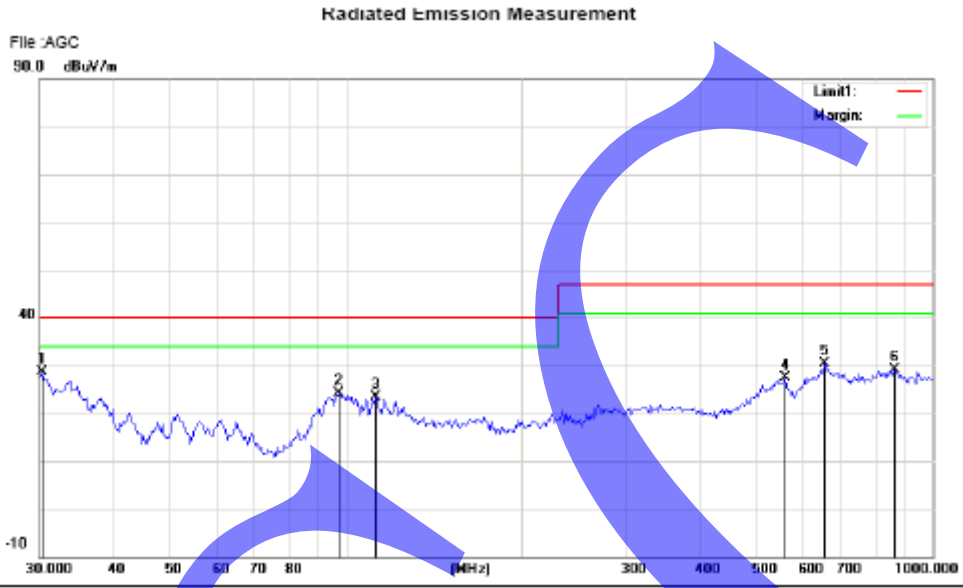
7.3. BLOCK DIAGRAM OF TEST SETUP



7.4. PROCEDURE OF RADIATED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used).When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per EN 55022.
3) All I/O cables were positioned to simulate typical actual usage as per EN 55022.
4) The EUT received AC100-240V/50Hz/60Hz power through the outlet socket under the turntable. All support equipments received AC230V/50Hz power from socket under the turntable, if any.
5) The antenna was placed at 10 meter away from the EUT as stated in EN 55022. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
7) The test mode(s) were scanned during the test:
8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

7.5. TEST RESULT OF RADIATED EMISSION TEST



Site 966 Chamber #1
Limit: EN55022 RE-CLass B 3M
EUT:
M/N:
Mode:
Note:

Polarization: *Horizontal*
Power:
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	30.3391	23.90	4.61	28.51	40.00	-11.49	peak			
2		97.0930	33.63	-9.47	24.16	40.00	-15.84	peak			
3		112.3676	28.47	-5.21	23.26	40.00	-16.74	peak			
4		560.5668	24.39	2.87	27.26	47.00	-19.74	peak			
5		656.0874	24.91	5.44	30.35	47.00	-16.65	peak			
6		864.0656	24.34	4.68	29.02	47.00	-17.98	peak			

Radiated Emission Measurement

Site 966 Chamber #1 | Polarization: *Vertical* | Temperature: 26
Limit: EN55022 RE-CLass B 3M | Power: | Humidity: 60 %
EUT: | Distance:
M/N:
Mode:
Note:

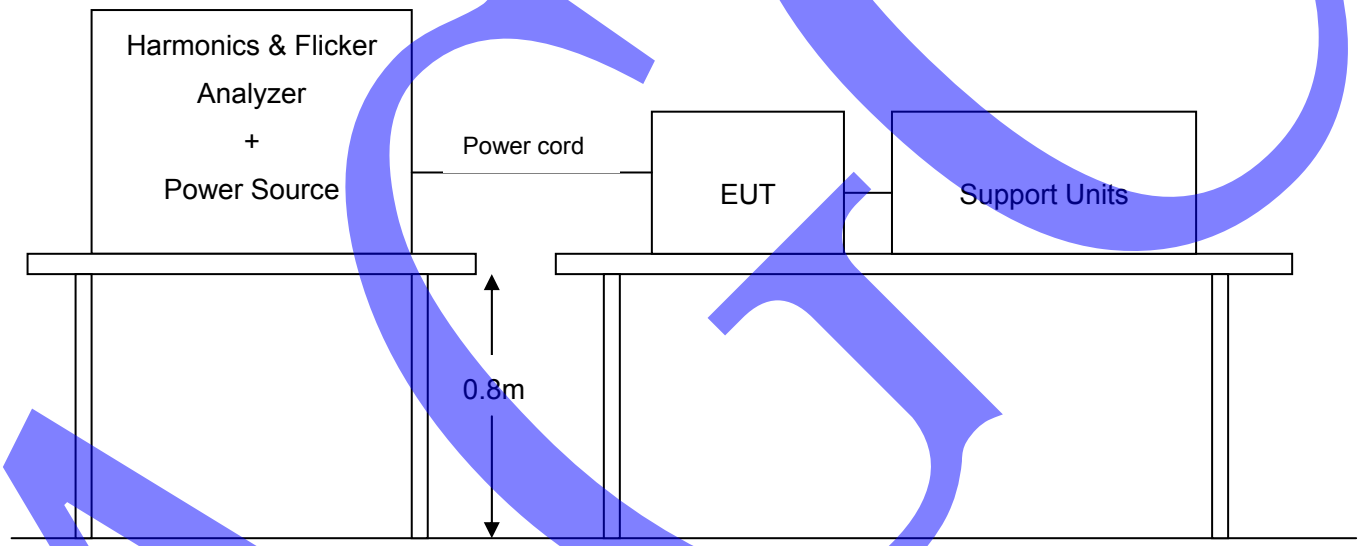
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	39.9565	32.61	-1.74	30.87	40.00	-9.13	peak			
2		72.4906	35.44	-11.03	24.41	40.00	-15.59	peak			
3		136.7915	23.58	-5.48	18.10	40.00	-21.90	peak			
4		268.4853	23.53	-2.32	21.21	47.00	-25.79	peak			
5		659.7846	23.23	2.72	25.95	47.00	-21.05	peak			
6		988.8240	23.48	7.83	31.31	47.00	-15.69	peak			

8. EN 61000-3-2 POWER HARMONICS TEST

POWER HARMONICS MEASUREMENT

Port :	AC mains
Basic Standard:	EN 61000-3-2 :2006
Limits:	☒CLASS A ; ☐CLASS B; ☐CLASS C; ☐CLASS D
Tester:	Sky
Temperature:	25°C
Humidity:	55%

8.1. BLOCK DIAGRAM OF TEST SETUP



8.2. LIMITS OF HARMONIC CURRENT

Limits for Class A Equipment	
Harmonics Order n	**Max. permissible harmonic current (A)**
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15≤n≤39	0.15×15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8≤n≤40	0.23×8/n

NOTE:

1. According to section 5 of EN61000-3-2: 2006, the EUT is Class A equipment.

2. The above limits are for all applications having an active input power>75W. No limits apply for equipment with an active input power up to and including 75W.

8.3. RESULT

Test Result

Harmonics Order	Harmonics Current (A)	Limit (A)		Harmonics Order	Harmonics Current (A)	Limit (A)
1	0.025	--		2	0.001	--
3	0.018	--		4	0.000	--
5	0.017	--		6	0.000	--
7	0.015	--		8	0.000	--
9	0.012	--		10	0.000	--
11	0.010	--		12	0.000	--
13	0.008	--		14	0.000	--
15	0.006	--		16	0.000	--
17	0.006	--		18	0.000	--
19	0.005	--		20	0.000	--
21	0.004	--		22	0.000	--
23	0.003	--		24	0.000	--
25	0.003	--		26	0.000	--
27	0.002	--		28	0.000	--
29	0.002	--		30	0.000	--
31	0.002	--		32	0.000	--
33	0.002	--		34	0.000	--
35	0.001	--		36	0.000	--
37	0.000	--		38	0.000	--
39	0.000	--		40	0.000	--

NOTE:

1. The active input power of the EUT is **15 W.**

2. No limits apply for equipment with an active input power up to and including 75W.

9. EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST

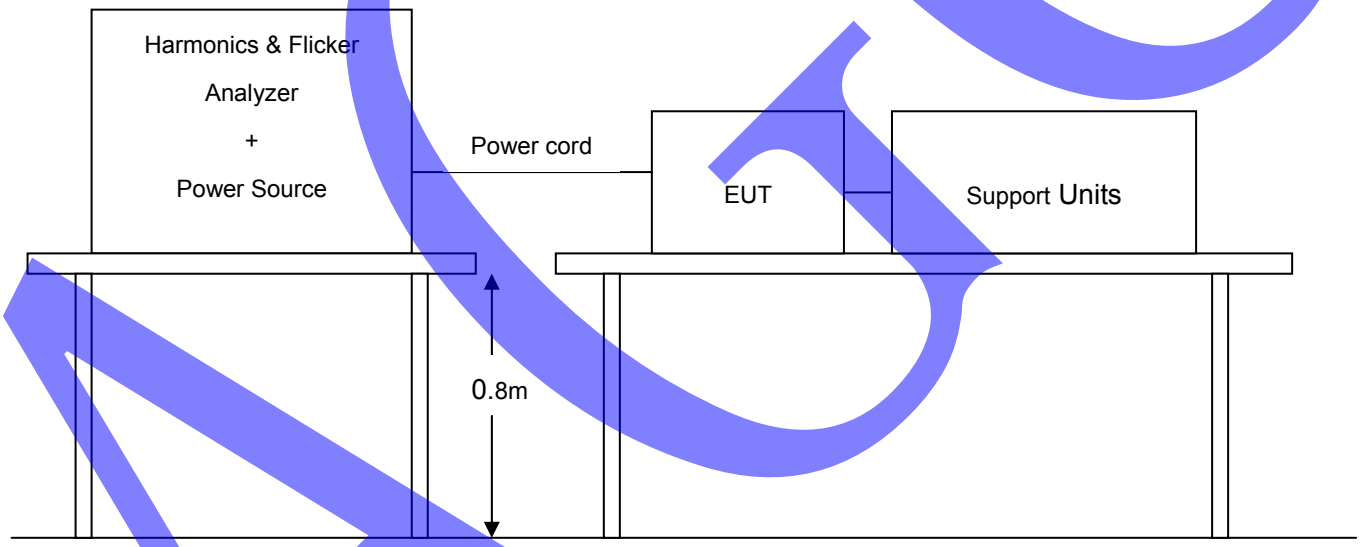
VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port :	AC mains
Basic Standard:	EN 61000-3-3 :2008
Limits:	§5 of EN 61000-3-3
Tester:	Sky
Temperature:	25°C
Humidity:	55%

9.1. TEST EQUIPMENT OF VOLTAGE FLUCTUATION / FLICKER TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Harmonic Emission Flicker	California instruments	500LIX-400-CTS	N/A	06/29/2009	06/28/2010

9.2. BLOCK DIAGRAM OF TEST SETUP



9.3. RESULT

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: 16 Port Dump Gigabit switch &16 Port Web-Smart Gigabit switch Tested by: Sky

Test category: All parameters (European limits) Test Margin: 100

Test date: 2010-01-14 Start time: 11:02:15 End time: 11:12:15

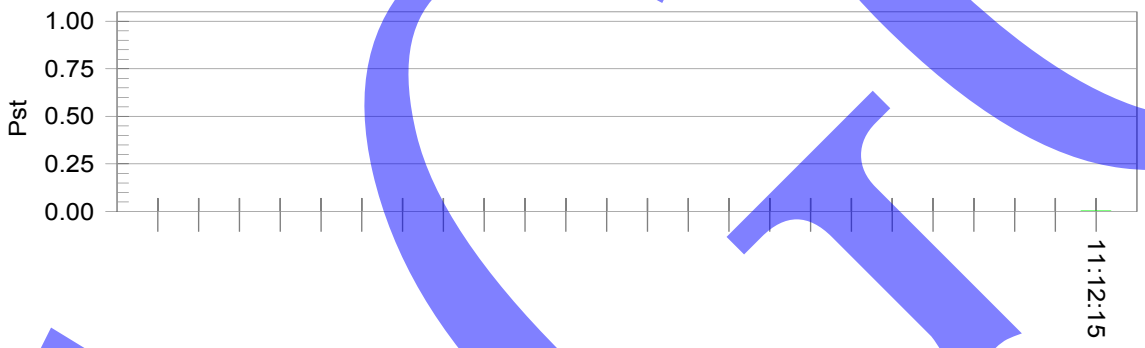
Test duration (min): 10

Comment: On

Customer: Rapidmax Technology Corporation

Test Result: Pass Status: Test Completed

Pst_i and limit line European Limits



Time is too short for Plt plot

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.78			
Highest dt (%):	-0.13	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.08	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.004	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.002	Test limit:	0.650	Pass

10. IEC 61000-4-2 ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

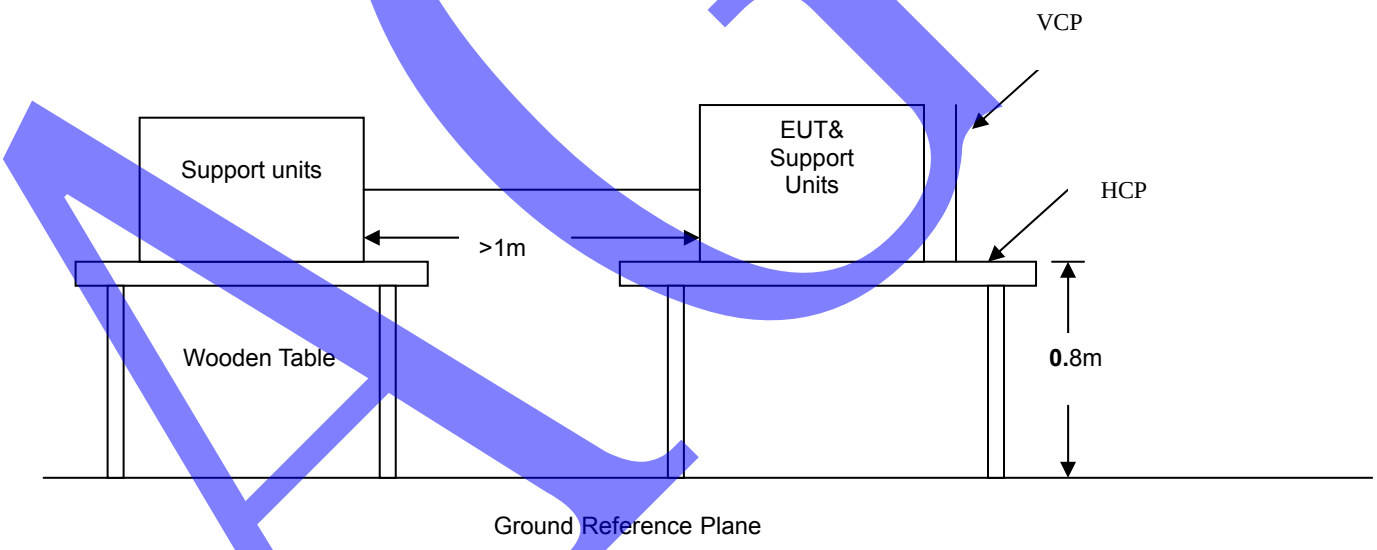
Port :	Enclosure
Basic Standard:	IEC 61000-4-2: 2008
Test Level:	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require:	B
Tester:	Sky
Temperature:	20°C
Humidity:	50%

10.1. TEST EQUIPMENT OF ESD TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
ESD System	HAEFELY	PESD 1610	N/A	06/29/2009	06/28/2010

10.2. BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)



10.3. TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.

The support units were located 1 m minimum away from the EUT.

EUT worked with resistance load, and make sure EUT worked normally.

Active the communication function if the EUT with such port(s).

As per the requirement of EN 55024; applying direct contact discharge at a minimum four points of the EUT

at minimum 200 discharges (100 positive and 100 negative) if applicable, one of the test points shall be subjected to at least 50 indirect discharges(contact) to the centre of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points available, then at least 200 indirect discharges shall be applied in the indirect mode. Tests shall be performed at a maximum repetition rate of one discharge per second.

Other parts of EUT where it is not possible to perform contact discharge then selecting appropriate points of EUT for air discharge, a minimum of 10 single air discharges shall be applied.

The application of ESD to the contact of open connectors is not required.

The following test condition was followed during the tests.

Note: As per the A2 to IEC 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

The electrostatic discharges were applied as follows:

Amount of Discharges	Voltage	Coupling	Result (Pass/Fail)
Mini 150 /Point	±2kV; ±4kV	Contact Discharge	Pass
Mini 50 /Point	±2kV; ±4kV	Indirect Discharge HCP (Front)	Pass
Mini 50 /Point	±2kV; ±4kV	Indirect Discharge VCP (Left)	Pass
Mini 50/Point	±2kV; ±4kV	Indirect Discharge VCP (Back)	Pass
Mini 50 /Point	±2kV; ±4kV	Indirect Discharge VCP (Right)	Pass
Mini 10 /Point	±2kV; ±4kV; ±8kV	Air Discharge	Pass

10.4. PERFORMANCE & RESULT

☐**Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☒**Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐**Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒***PASS*** ☐***FAIL***

11. IEC 61000-4-3 TEST

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port : Enclosure

Basic Standard: IEC 61000-4-3:2008

Test Level: 3V/m with 80% AM. 1kHz Modulation.

Standard require: A

Tester: Sky

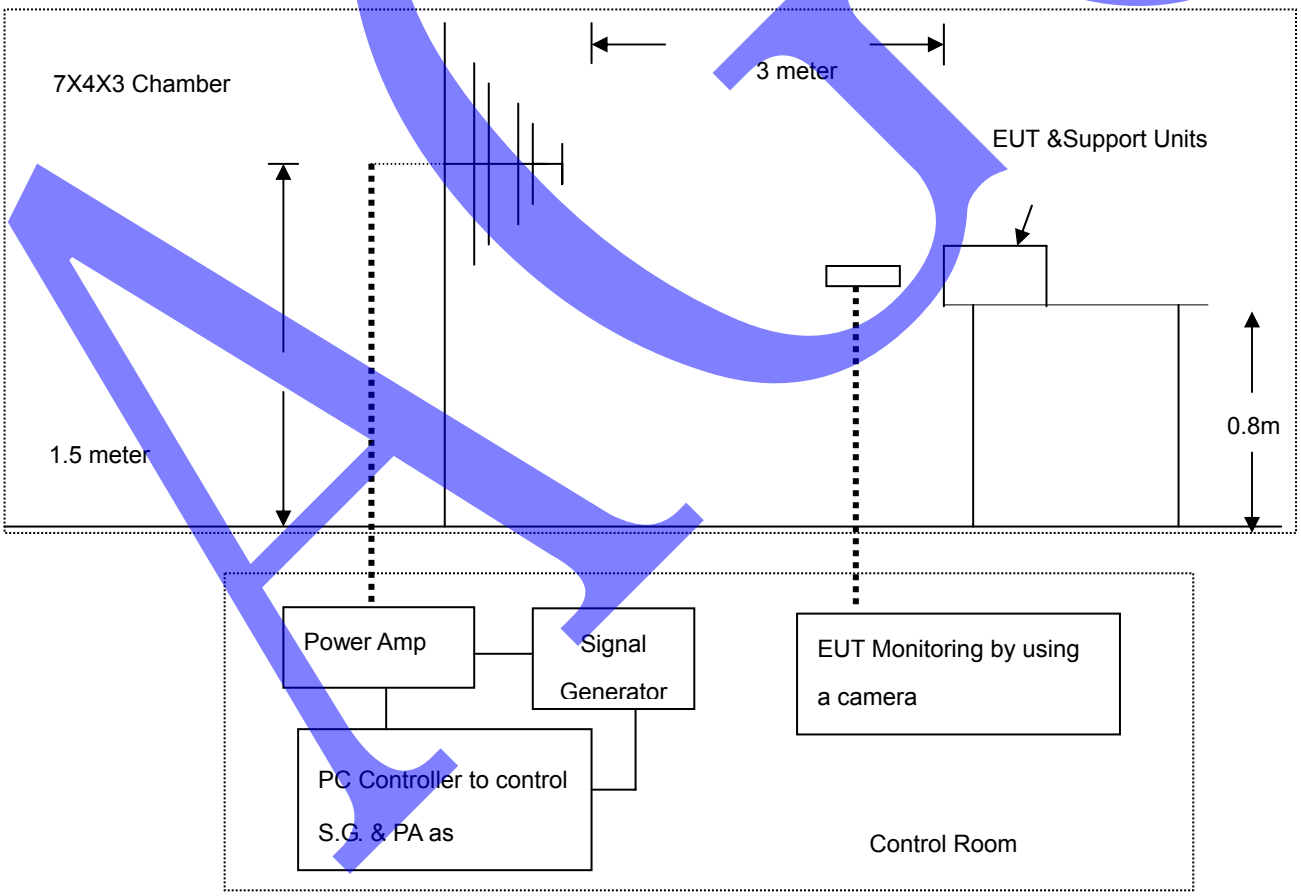
Temperature: 25°C

Humidity: 55%

11.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Signal Generator	IFA	2023B	N/A	06/29/2009	06/28/2010
Power Amplifier	AR	150W1000	N/A	06/29/2009	06/28/2010
Power Antenna	AR	25S1G4A	N/A	06/29/2009	06/28/2010

11.2. BLOCK DIAGRAM OF TEST SETUP



11.3. TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per IEC 61000-4-3.

EUT worked with resistance load, and make sure EUT worked normally.

Setting the testing parameters of RS test software per IEC 61000-4-3.

Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz

Recording the test result in following table.

IEC 61000-4-3 Final test conditions:

Test level: 3V/m

Steps: 1 % of fundamental

Dwell Time: 1 sec

Range (MHz)	Field	Modulation	Polarity	Position	Result (Pass/Fail)
80-1000	3V/m	AM	H	Front	Pass
80-1000	3V/m	AM	H	Left	Pass
80-1000	3V/m	AM	H	Back	Pass
80-1000	3V/m	AM	H	Right	Pass
80-1000	3V/m	AM	V	Front	Pass
80-1000	3V/m	AM	V	Left	Pass
80-1000	3V/m	AM	V	Back	Pass
80-1000	3V/m	AM	V	Right	Pass

11.4. PERFORMANCE & RESULT

☒**Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐**Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐**Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒***PASS*** ☐***FAIL***

12. IEC 61000-4-4 TEST

ELECTRICAL FAST TRANSIENTS/BURST IMMUNITY TEST

Port : On Power Supply Lines

Basic Standard: IEC 61000-4-4:2004

Test Level: +/- 1kV for Power Supply Lines

Standard require: B

Tester: Sky

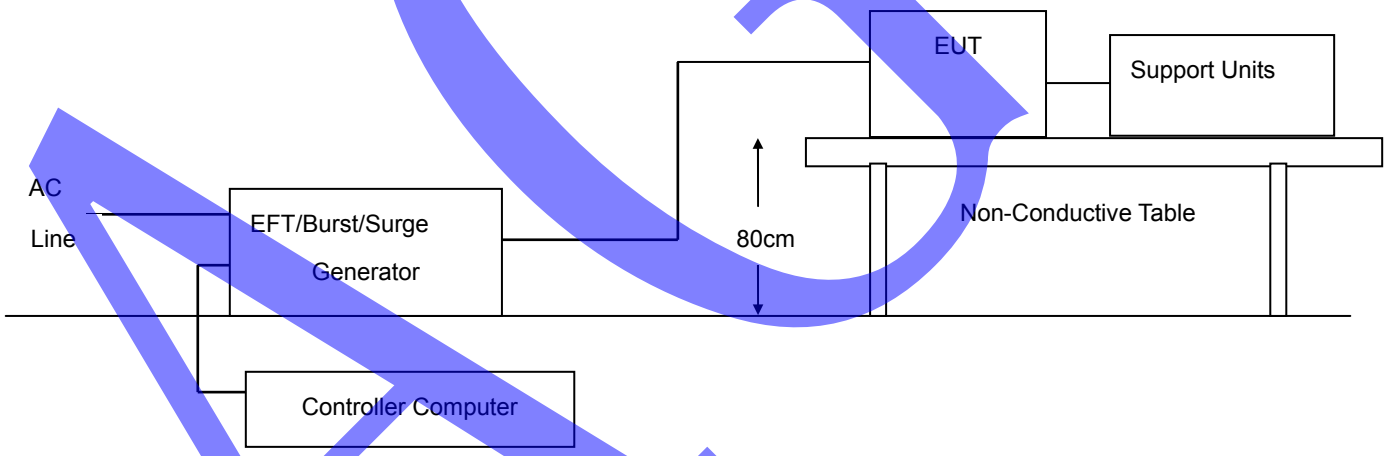
Temperature: 25°C

Humidity: 55%

12.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M/6B	N/A	06/29/2009	06/28/2010
Capacitive Clamp	EM-Test	C Clamp HFK	N/A	06/29/2009	06/28/2010
CDN for Telecom Port	EM-Test	CNV504S1	N/A	06/29/2009	06/28/2010

12.2. BLOCK DIAGRAM OF TEST SETUP



12.3. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8m away from ground reference plane.
A 1.0 meter long power cord was attached to EUT during the test.
The length of communication cable between communication port and clamp was keeping within 1 meter.
EUT worked with resistance load, and make sure EUT worked normally.
Related peripherals work during the test.
Recording the test result as shown in following table.

Test conditions:

Impulse Frequency: 5 kHz

Tr/Th: 5/50ns

Burst Duration: 15ms

Burst Period: 300ms

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
L+N	+ 1	Direct	Pass
L+N	- 1	Direct	Pass

12.4. PERFORMANCE & RESULT

☐**Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☒**Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐**Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒*PASS*	☐*FAIL*

13. IEC 61000-4-5 SURGE IMMUNITY TEST

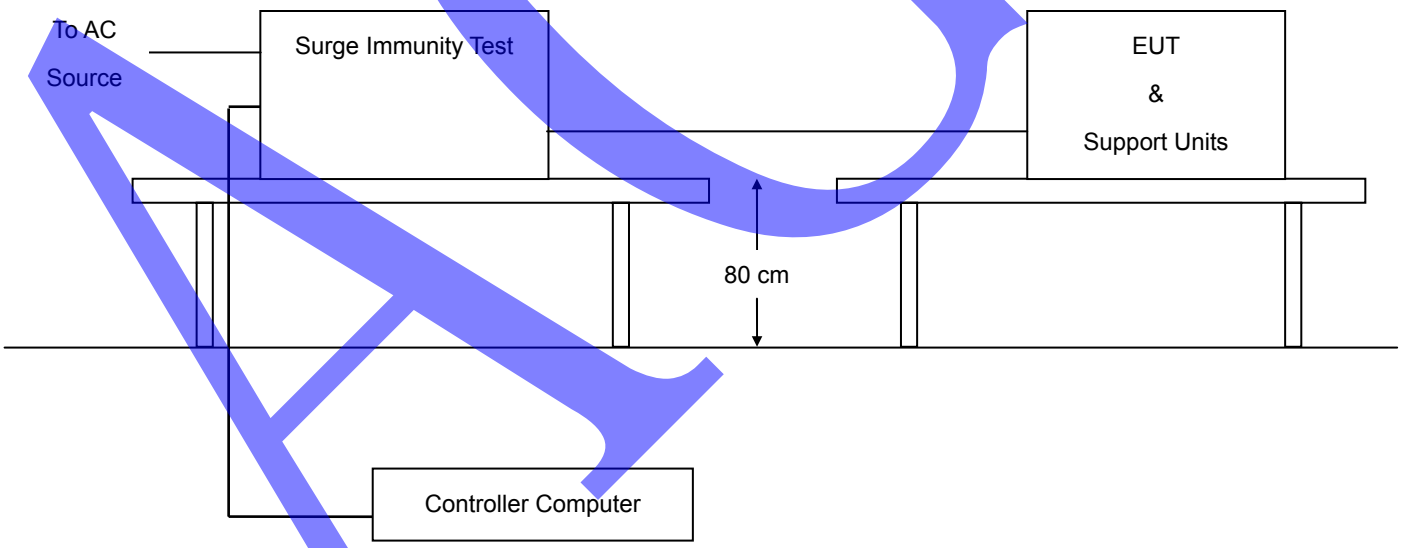
SURGE IMMUNITY TEST

Port :	On Power Supply Lines
Basic Standard:	IEC 61000-4-5:2005
Requirements :	+/- 1kV (Line to Line) +/- 2kV (Line to Ground)
Standard require:	B
Tester:	Sky
Temperature:	25°C
Humidity:	55%

13.1. TEST EQUIPMENT OF SURGE TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M/6B	N/A	06/29/2009	06/28/2010
Capacitive Clamp	EM-Test	C Clamp HFK	N/A	06/29/2009	06/28/2010
CDN for Telecom Port	EM-Test	CNV504S1	N/A	06/29/2009	06/28/2010

13.2. BLOCK DIAGRAM OF TEST SETUP



13.3. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8 m away from ground floor.

EUT worked with resistance load, and make sure EUT worked normally.

Recording the test result as shown in following table.

Test conditions:

Voltage Waveform: 1.2/50 *u*s
Current Waveform: 8/20 *u*s
Polarity: Positive/Negative
Phase angle: 0^{o}, 90^{o}, 270^{o}
Number of Test: 5

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Result (Pass/Fail)
L1-L2	1	Positive	Capacitive	Pass
L1-L2	1	Negative	Capacitive	Pass

13.4. PERFORMANCE & RESULT

☐**Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☒**Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐**Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒***PASS*** ☐***FAIL***

14. IEC 61000-4-6 TEST

IEC 61000-4-6 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELD

Port : On Power Supply Lines

Basic Standard: IEC 61000-4-6: 2008

Requirements : 3V with 80% AM. 1 kHz Modulation

Standard require: A

Tester: Sky

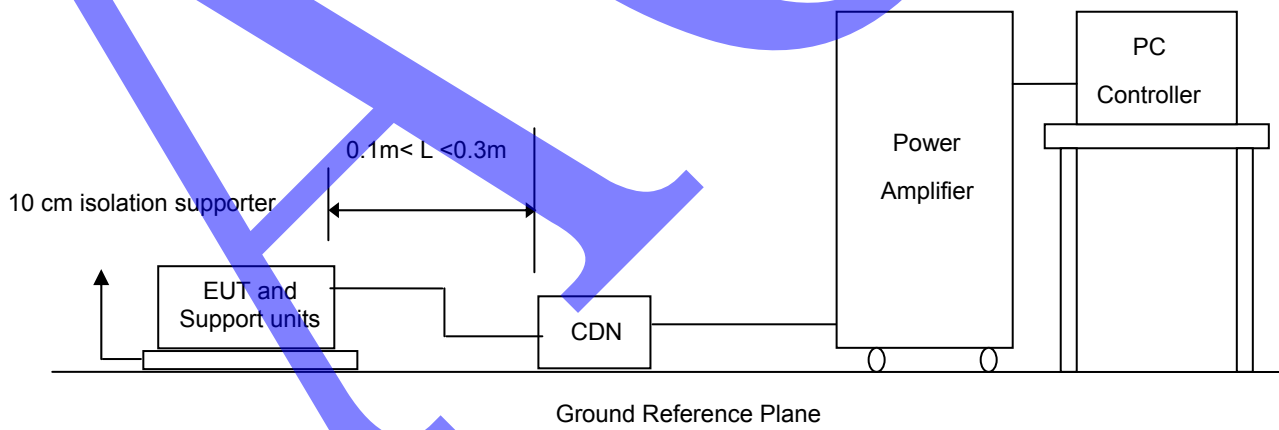
Temperature: 25°C

Humidity: 55%

14.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Power Amplifier	AR	75A250A	N/A	06/29/2009	06/28/2010
CDN	EM-Test	N/A	N/A	06/29/2009	06/28/2010
Direction Coupler	EM-Test	DC2600N	N/A	06/29/2009	06/28/2010
EM-Clamp	EM-Test	EM101	N/A	06/29/2009	06/28/2010
Caliberation	EM-Test	CAM2/M3	N/A	06/29/2009	06/28/2010
Attenuator	EM-Test	ATT6/75	N/A	06/29/2009	06/28/2010
Power Sensor	AR	PH2000	N/A	06/29/2009	06/28/2010
Power Meter	AR	PM2002	N/A	06/29/2009	06/28/2010
Signal Generator	IFA	2023B	N/A	06/29/2009	06/28/2010

14.2. BLOCK DIAGRAM OF TEST SETUP



14.3. TEST PROCEDURE

The EUT and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.

EUT worked with resistance load, and make sure EUT worked normally.

Related peripherals work during the test.

Setting the testing parameters of CS test software per IEC 61000-4-6.

Recording the test result in following table.

Test conditions:

Frequency Range: 0.15MHz-80MHz

Frequency Step: 1% of fundamental

Dwell Time: 1 sec

Range (MHz)	Strength	Modulation	Result (Pass/Fail)
0.15-80	3V	AM	Pass

14.4. PERFORMANCE & RESULT

☒**Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐**Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐**Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒*PASS* ☐*FAIL*

15. IEC 61000-4-11 TEST

VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

Port : On Power Supply Lines

Basic Standard: IEC 61000-4-11: 2004

Requirements : 0, 45, 90, 135, 180, 225, 270, 315 degrees

Test Interval: Min. 10 sec.

Tester: Sky

Temperature: 25°C

Humidity: 55%

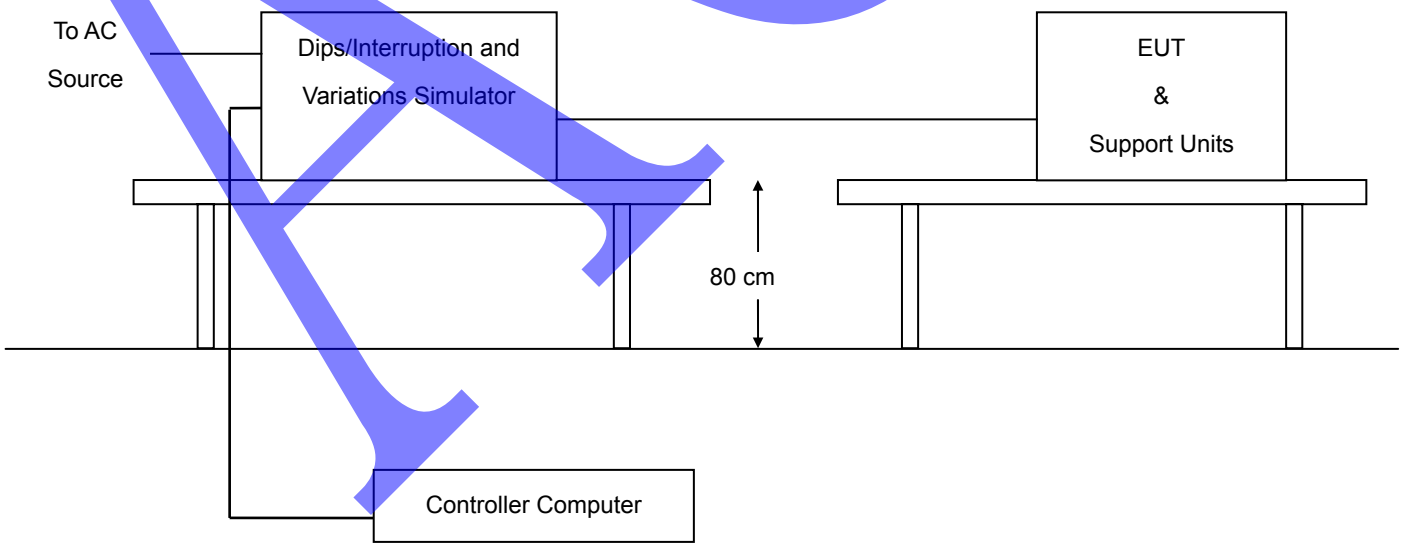
Voltage Dips	Test Level % U_T	Reduction (%)	Duration (periods)	Performance Criteria
	<5	>95	0.5	B
	70	30	25	C

Voltage Interruptions	Test Level % U_T	Reduction (%)	Duration (periods)	Performance Criteria
	<5	>95	250	C

15.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M/6B	N/A	06/29/2009	06/28/2010
Capacitive Clamp	EM-Test	C Clamp HFK	N/A	06/29/2009	06/28/2010
CDN for Telecom Port	EM-Test	CNV504S1	N/A	06/29/2009	06/28/2010

15.2. BLOCK DIAGRAM OF TEST SETUP



15.3. TEST PROCEDURE

The EUT and support units were located on a wooden table, 0.8 m away from ground floor.
EUT worked with resistance load, and make sure EUT worked normally.
Setting the parameter of tests and then perform the test software of test simulator.
Conditions changes to occur at 0 degree crossover point of the voltage waveform.
Recording the test result in test record form.

Test conditions:

The duration with a sequence of three dips/interruptions with interval of 10 s minimum (Between each test event)

Voltage Dips:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
<5	>95	0.5	Normal	B
70	30	25	Normal	C

Voltage Interruptions:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
<5	>95	250	Normal	C

15.4. PERFORMANCE

☐**Criteria A:** The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☒**Criteria B:** The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☒**Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒***PASS*** ☐***FAIL***

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

EN 55022 LINE CONDUCTED EMISSION TEST SETUP

IEC 61000-4-2 ELECTROSTATIC DISCHARGE TEST SETUP

APPENDIX 2
PHOTOGRAPHS OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

LEFT VIEW OF EUT

RIGHT VIEW OF EUT

BACK VIEW OF EUT

FRONT VIEW OF EUT

-----END OF REPORT-----