Test Certificate

A sample of the following product received on April 3, 2012 and tested on April 3, 11, 12, 13, 14, 16 and 17, 2012 complied with the requirements of,

- **Subpart B of Part 15 of FCC Rules for Class A digital devices**
- **Industry Canada Interference Causing Equipment Standard ICES-003 Issue 4, dated February 2004 (Class A)**
- **VCCI Regulations For Voluntary Control Measures of radio interference generated by Information Technology Equipment, dated April 2012 (Class A)**
- **EN 55022:2010, "Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement" (Class A)**
- **CISPR 22:2008 "Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement" (Class A)**
- **AS/NZS CISPR 22:2009: "Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement" (Class A)**
- **EN 55024:2010 "Information technology equipment – Immunity characteristics, Limits and method of measurement."**
- **CISPR 24:2010 "Information technology equipment – Immunity characteristics, Limits and method of measurement."**
- **EN 61000-3-2:2006 /A1:2009 /A2:2009 – AC Current Harmonics**
- **EN 61000-3-3:2008 – AC Voltage Fluctuations**

given the measurement uncertainties detailed in Elliott report R87364 Rev 1.

SUPERMICRO Computer, Inc.
Super Storage Server
Model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12)

Wayne Fisher
Engineering Team Lead

_____
SUPERMICRO Computer, Inc.

_____
Printed Name

Testing Cert #0214.26

Elliott Laboratories is accredited by the A2LA, certificate number 0214.26, to perform the test(s) listed in this report, except where noted otherwise. This report and the information contained herein represent the results of testing test articles identified and selected by the client performed to specifications and/or procedures selected by the client. National Technical Systems (NTS) makes no representations, expressed or implied, that such testing is adequate (or inadequate) to demonstrate efficiency, performance, reliability, or any other characteristic of the articles being tested, or similar products. This report should not be relied upon as an endorsement or certification by NTS of the equipment tested, nor does it represent any statement whatsoever as to its merchantability or fitness of the test article, or similar products, for a particular purpose. This report shall not be reproduced except in full

EMC Test Report
Class A Information Technology Equipment
Class A Digital Device
FCC Part 15; Industry Canada ICES-003 Issue 4
VCCI Regulations 2012
EN 55022:2010; CISPR 22:2008
AS/NZS CISPR 22:2009
EN 61000-3-2:2006 /A1:2009 /A2:2009,
EN 61000-3-3:2008
EN 55024:2010; CISPR 24:2010

Model: 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12)

COMPANY:	SUPERMICRO Computer, Inc. 980 Rock Avenue San Jose, CA 95131
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road Fremont, CA. 94538-2435
REPORT DATE:	May 2, 2012
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ACCREDITED
Testing Cert #0214.26

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	05-02-2012	First release	
1	05-17-2012	Reissued to add model names and correct typos	Dave Guidotti

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SCOPE

Governments and standards organizations around the world have published requirements regarding the electromagnetic compatibility (EMC) of electronic equipment. Testing has been performed on the SUPERMICRO Computer, Inc. model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12), pursuant to the following standards.

Standard	Title	Standard Date
FCC Part 15, Subpart B	Radio Frequency Devices	October 2011 as Amended
ICES-003, Issue 4	Digital apparatus	2004
VCCI V-3	VCCI Regulations For Voluntary Control Measures of radio interference generated by Information Technology Equipment	April 2012
CISPR 22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2008 w A1:
AS/NZS CISPR 22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2009
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2010
EN 61000-3-2	Electromagnetic compatibility - Limits For Harmonic Current Emissions (Equipment Input Current <= 16A Per Phase)	2006 + A1:2009 + A2:2009
EN 61000-3-3	Electromagnetic compatibility - Limitation Of Voltage Fluctuations And Flicker In Low Voltage Supply Systems For Equipment With Rated Current <= 16A Per Phase	2008
EN 55024	Information technology equipment – Immunity characteristics, Limits and method of measurement	2010
CISPR 24	Information technology equipment – Immunity characteristics, Limits and method of measurement	2010

All measurements and evaluations have been in accordance with these specifications, test procedures, and measurement guidelines as outlined in Elliott Laboratories test procedures, and in accordance with the standards referenced therein (refer to Appendix J).

OBJECTIVE

The objective of SUPERMICRO Computer, Inc. is to:

- declare conformity with the essential requirements of the EMC directive 2004/108/EC using the harmonized standard(s) referenced in this report;
- declare conformity with the electromagnetic compatibility (EMC) regulatory arrangement of the Australian Communications and Media Authority (ACMA);
- verify compliance with FCC requirements for digital devices and Canada's requirements for digital devices;
- verify compliance to the Japanese VCCI requirements for Information Technology Equipment;

STATEMENT OF COMPLIANCE

The tested sample of SUPERMICRO Computer, Inc. model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12) complied with the requirements of:

Standard/Regulation	Equipment Type/Class	Standard Date
Subpart B of Part 15 of the FCC Rules (CFR title 47)	Class A	2011 as amended
ICES-003, Issue 4	Class A	2004
VCCI Regulations V-3	Class A	2012
EN 55022	Class A	2010
CISPR 22 Edition 6	Class A	2008
AS/NZS CISPR 22	Class A	2009
EN 61000-3-2	Class A	2006 +A1:2009 +A2:2009
EN 61000-3-3	General Limits for d_{max}, P_{lt}, P_{st}, d(t), and d_c	2008
EN55024	-	2010
CISPR 24	-	2010

This report is suitable for demonstrating compliance with the EMC requirements in Australia and New Zealand. Refer to Appendix I for more details.

As specified in Section 15.101 of FCC Part 15, unintentional radiators shall be authorized prior to the initiation of marketing. Based on the description of the EUT, the following criteria per Section 15.101 of FCC Part 15 were applied to the EUT:

Type of device	**Equipment authorization required**
Class A digital devices, peripherals & external switching power supplies	Verification

The test results recorded herein are based on a single type test of the SUPERMICRO Computer, Inc. model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12) and therefore apply only to the tested sample(s). The sample was selected and prepared by Victor Yuan of SUPERMICRO Computer, Inc..

Maintenance of compliance is the responsibility of the company. Any modification of the product that could result in increased emissions or susceptibility should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different enclosure, different line filter or power supply, harnessing and/or interface cable changes, etc.).

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

INFORMATION TECHNOLOGY EQUIPMENT EMISSIONS TEST RESULTS

The following emissions tests were performed on the SUPERMICRO Computer, Inc. model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12). The measurements were extracted from the data recorded during testing and represent the highest amplitude emissions relative to the specification limits. The complete test data is provided in the appendices of this report.

CONDUCTED EMISSIONS (MAINS PORT)

Frequency Range Operating Voltage	Standard/Section	Requirement	Measurement	Margin	Status
0.15-30 MHz, 230 V, 50 Hz P/S: PWS-1K28P-SQ	FCC § 15.107(b) VCCI Table 4.1 CISPR 22 Table 1 EN 55022 Table 1 AS/NZS CISPR 22 Table 1 (Class A)	0.15-0.5 MHz: 79 dBµV QP 66 dBµV Av 0.5-30 MHz: 73 dBµV QP 60 dBµV Av	36.8 dBµV @ 0.301 MHz	-29.2 dB	Complied
0.15-30 MHz, 230 V, 50 Hz P/S: PWS-920P-1R			53.1 dBµV @ 0.679 MHz	-6.9 dB	Complied
0.15-30 MHz, 120 V, 60 Hz P/S: PWS-1K28P-SQ			34.3 dBµV @ 0.798 MHz	-25.7 dB	Complied
0.15-30 MHz, 120 V, 60 Hz P/S: PWS-920P-1R			48.1 dBµV @ 0.721 MHz	-11.9 dB	Complied

CONDUCTED EMISSIONS (TELECOMMUNICATIONS PORTS)

Frequency Range Measurement *Port*	Data Rate	Standard/Section	Requirement	Measurement	Margin	Status
0.15-30 MHz, Voltage *Ethernet*	10/100 Mb/s	EN 55022 Table 3 CISPR 22 Table 3 VCCI Table 4.3 AS/NZS CISPR 22 Table 3 KN22 (Class A)	0.15-0.5 MHz, 97-87 dBµV QP 84-74 dBµV Av 0.5-30.0 MHz: 87 dBµV QP 74 dBµV Av	63.9 dBµV @ 1.763 MHz	-10.1dB	Complied

RADIATED EMISSIONS

Frequency Range	Standard/Section	Requirement	Measurement	Margin	Status
30-1000 MHz	EN 55022 Table 5 CISPR 22 Table 5 FCC §15.109(g) VCCI Table 4.5 AS/NZS CISPR 22 Table 5 Class A	30-230 MHz, 40 dBµV/m 230-1000 MHz, 47 dBµV/m (10 m limit)	36.4 dBµV/m @150.01 MHz	-3.6dB	Complied
1000-15000 MHz Note 1	FCC §15.109(b) Class A	49.5 dBµV/m Av 69.5 dBµV/m Pk (10 m limit)	47.2 dBµV/m @6000.0 MHz	-2.3 dB	Complied
1000-6000 MHz Note 2	EN 55022 Table 7 CISPR 22 Table 7 VCCI Table 4.7 KN22 (Free-Space Measurement) Class A	1-3 GHz 56 dBµV/m Av 76 dBµV/m Pk 3-6 GHz 60 dBµV/m Av 80 dBµV/m Pk (3 m limit)	52.4 dBµV/m @1200.1 MHz	-3.6 dB	Complied

Note 1 As the highest frequency generated in the EUT was declared to be above 1 GHz, the upper frequency for radiated measurements was 5 times the highest frequency or 40 GHz, whichever is less. For this device the highest frequency declared was 2 GHz so the highest frequency measured was 15 GHz.

Note 2 As the highest frequency of the internal sources of the EUT was declared to be above 1 GHz, the upper frequency for radiated measurements was 5 times the highest frequency or 6 GHz, whichever is less. For this device the highest frequency declared was 2 GHz so the highest frequency measured was 6 GHz.

EN 61000-3-2, EN 61000-3-3 TEST RESULTS

The following emissions tests were performed on the SUPERMICRO Computer, Inc. model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12). The measurements were extracted from the data recorded during testing and represent the highest amplitude emissions relative to the specification limits. The actual test results are contained in Appendix C and Appendix D.

Frequency Range	Standard/Section	Requirement	Measurement	% of limit	Status
100 Hz – 2000 Hz P/S: PWS-1K28P-SQ	EN 61000-3-2 Class A	Refer to standard and test data	0.017 A at harmonic #39	30.00% of limit	Complied
100 Hz – 2000 Hz P/S: PWS-920P-1R	EN 61000-3-2 Class A	Refer to standard and test data	0.009 A at harmonic #31	12.08% of limit	Complied
100 Hz – 2000 Hz SSG-6047R-E1R24N	EN 61000-3-2 Class A	Refer to standard and test data	0.201 A at harmonic #3	8.74% of limit	Complied
100 Hz – 2000 Hz SSG-6047R-E1R36N	EN 61000-3-2 Class A	Refer to standard and test data	0.019 A at harmonic #40	41.54% of limit	Complied
P/S: PWS-1K28P-SQ	EN 61000-3-3	d(t) ≤ 3.3% dc ≤ 3.3% d_{max} ≤ 4.0% P_{st} ≤ 1.0 P_{lt} ≤ 0.65	dt (%): 0.00 dc (%): 0.00 d_{max} (%): 0.00 P_{st} : 0.064 P_{lt}: not evaluated	-	Complied
P/S: PWS-920P-1R	EN 61000-3-3	d(t) ≤ 3.3% dc ≤ 3.3% dmax ≤ 4.0% Pst ≤ 1.0 Plt ≤ 0.65	dt (%): 0.00 dc (%): 0.00 dmax (%): 0.00 Pst : 0.064 Plt: not evaluated	-	Complied
SSG-6047R-E1R24N	EN 61000-3-3	d(t) ≤ 3.3% dc ≤ 3.3% dmax ≤ 4.0% Pst ≤ 1.0 Plt ≤ 0.65	dt (%): 0.00 dc (%): 0.00 d_{max} (%): 0.00 P_{st} : 0.064 P_{lt}: 0.035	-	Complied
SSG-6047R-E1R36N	EN 61000-3-3	d(t) ≤ 3.3% dc ≤ 3.3% dmax ≤ 4.0% Pst ≤ 1.0 Plt ≤ 0.65	dt (%): 0.00 dc (%): 0.00 dmax (%): 0.00 Pst : 0.064 Plt: 0.064	-	Complied

INFORMATION TECHNOLOGY EQUIPMENT IMMUNITY TEST RESULTS

The following tests were performed on the SUPERMICRO Computer, Inc. model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12). The results are based upon performance criteria defined by the company and as detailed in this test report.

Test	Basic Standard	Level		Criterion		Status
		Required	Tested	Req.	Met	
ESD	EN 61000-4-2 IEC 61000-4-2	4 kV CD 8 kV AD	4 kV CD 8 kV AD	B	A	Complied
RF EM Field AM 80% AM 1 kHz	EN 61000-4-3 IEC 61000-4-3	80-1000 MHz 3 V/m	80-1000 MHz 3 V/m	A	A	Complied
EFT, AC Power Port	EN 61000-4-4 IEC 61000-4-4	1.0 kV	1 kV	B	A	Complied
EFT, DC Power Port		0.5 kV	NA	B	NA	N/A – Note 1
EFT, Signal Ports		0.5 kV	0.5 kV	B	A	Complied
Surge, AC Power Port	EN 61000-4-5 IEC 61000-4-5	1 kV DM, 2 kV CM 1.2/50 µs	1 kV DM, 2 kV CM 1.2/50 µs	B	A	Complied
Surge, DC Power Port		0.5 kV 1.2/50 µs	NA	B	NA	N/A – Note 1
Surge, Signal Ports		1.0 kV 10/700 µs	NA	C	NA	N/A – Note 2
		4.0 kV 10/700 µs	NA	C	NA	N/A – Note 2
RF, conducted continuous, Signal Ports	EN 61000-4-6 IEC 61000-4-6	0.15-80 MHz, 3 Vrms 80% AM 1 kHz	0.15-80 MHz, 3 Vrms 80% AM 1 kHz	A	A	Complied
RF, conducted continuous, AC Power Port		0.15-80 MHz, 3 Vrms 80% AM 1 kHz	0.15-80 MHz, 3 Vrms 80% AM 1 kHz	A	A	Complied
RF, conducted continuous, DC Power Port		0.15-80 MHz, 3 Vrms 80% AM 1 kHz	NA	A	NA	N/A – Note 1
Power Frequency Magnetic Field	EN 61000-4-8 IEC 61000-4-8	3A/m 50 Hz 60 Hz	NA	A	NA	N/A – Note 3
Voltage Dips and Interrupts (50 Hz)	EN 61000-4-11 IEC 61000-4-11	>95%, 0.5 cycles 30%, 25 cycles >95%, 250 cycles	>95%, 0.5 cycles 30%, 25 cycles >95%, 250 cycles	B C C	A A C	Complied

Note 1 The EUT does not have any DC power ports
Note 2 The EUT does not have any ports that connect directly to outdoor cables.
Note 3 SUPERMICRO Computer, Inc. stated that the EUT does not contain any components susceptible to 50Hz magnetic fields.

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below were calculated using the approach described in CISPR 16-4-2:2003 using a coverage factor of k=2, which gives a level of confidence of approximately 95%. The levels were found to be below levels of *U*cispr and therefore no adjustment of the data for measurement uncertainty is required.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
Conducted Emissions	dBuV or dBuA	150 kHz – 30 MHz	± 2.2 dB
Radiated Electric Field	dBuV/m	30-1000 MHz	± 3.6 dB
		1000-40,000 MHz	± 6.0 dB
AC Current Harmonics	Amps	50 to 2,000 Hz	± 0.12 %
AC Voltage Flicker	Voltage	N/A	± 0.12 %
	Pst, Plt	N/A	± 3.46 %
Radiated Immunity	V/m	80-2700 MHz	- 26.3%, + 29.97%
ESD	KV	N/A	± 8.6%
Fast Transients	Voltage	N/A	± 5.98 %
	Timing	N/A	± 8.60 %
Surge	Voltage	N/A	± 4.92 %
RF Common Mode (CDN method)	Vrms	N/A	-12.64 %, +13.33 %
RF Common Mode (BCI method)	Vrms	N/A	-13.45 %, +15.32 %
Voltage Dips	Voltage	N/A	± 2.32 %
Voltage Dips	Timing	N/A	± 0.08 mS

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The SUPERMICRO Computer, Inc. model 6037R-E1R16N (X9Dri-LN4F+) (836-9), 6047R-E1R24N (X9DRi-LN4F+) (846-9) and 6047R-E1R36N (X9DRi-LN4F+) (847-12) is a Storage Server system comprised of 3 units. (2)4U Storage Servers and (1) 3U Storage Server that are designed to store and retrieve data. Normally the EUT would be rack mounted during operation. The EUT was treated as table-top equipment during testing. The electrical rating of the EUT is 100-230 Volts, 50/60 Hz, and 5 Amps.

The sample was received on April 3, 2012 and tested on April 3, 11, 12, 13, 14, 16 and 17, 2012. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number
Supermicro Computer	6047R-E1R24N (X9DRi-LN4F+) (846-9)	4U Storage Server	Proto
Supermicro Computer	6037R-E1R16N (X9DRi-LN4F+) (836-9)	3U Storage Server	Proto
Supermicro Computer	6047R-E1R36N (X9DRi-LN4F+) (847-12)	4U Storage Server	Proto

OTHER EUT DETAILS

The following EUT details should be noted:
CPU @ 2.0GHz

6047R-E1R24N EUT Test Configuration

Host System/EUT Configuration List			
Model/Part #:		6047R-E1R24N	
Subassembly	**Manufacturer**	**Model**	**Qty/Specs/Remarks**
Chassis/Enclosure	Ablecom Technology	CSE-846	-
Power supply	Supermicro	PWS-920P-1R	1.11
Main board	Supermicro	X9DRi-LN4F+	-
Backplane	Supermicro	SAS2-846EL1	-
CPU/Processor	Intel	Xeon E5	
Memory	Samsung	Pc3	2GB/8pcs
Hard drive disk	Hitachi	0F10452	2TB
Rear fan	Sanyo	9GA0812P2M0031	Fan-0125L4/2pcs/12V, 0.35A
Mid Fan	Nidec	V80E12BHA5-57	Fan-0127L4/3pcs/12v, 0.6A
Ipass cable	Amphenol	-	SAS cable with 2 port external bracket
RAID	Supermicro	AOC-SAS2LP-H8iR	1.10

6037R-E1R16N EUT Test Configuration

Host System/EUT Configuration List			
Model/Part #:		6037R-E1R16N	
Subassembly	**Manufacturer**	**Model**	**Qty/Specs/Remarks**
Chassis/Enclosure	Ablecom Technology	CSE-846	-
Power supply	Supermicro	PWS-920P-1R	1.11
Main board	Supermicro	X9DRi-LN4F+	-
Backplane	Supermicro	SAS2-846EL1	-
CPU/Processor	Intel	Xeon E5	
Memory	Samsung	Pc3	2GB/8pcs
Hard drive disk	Hitachi	0F10452	2TB
Rear fan	Sanyo	9GA0812P2M0031	Fan-0125L4/2pcs/12V, 0.35A
Mid Fan	Nidec	V80E12BHA5-57	Fan-0127L4/3pcs/12v, 0.6A
Ipass cable	Amphenol	-	SAS cable with 2 port external bracket
RAID	Supermicro	AOC-SAS2LP-H8iR	1.10

6047R-E1R36N EUT Test Configuration

Host System/EUT Configuration List			
Model/Part #:		6047R-E1R36N	
Subassembly	**Manufacturer**	**Model**	**Qty/Specs/Remarks**
Chassis/Enclosure	Ablecom Technology	CSE-846	-
Power supply	Supermicro	PWS-1K28P-SQ	1.11
Main board	Supermicro	X9DRi-LN4F+	-
Backplane	Supermicro	SAS2-846EL1	-
CPU/Processor	Intel	Xeon E5	
Memory	Samsung	Pc3	2GB/8pcs
Hard drive disk	Hitachi	0F10452	2TB
Rear fan	Sanyo	9GA0812P2M0031	Fan-0125L4/2pcs/12V, 0.35A
Mid Fan	Nidec	V80E12BHA5-57	Fan-0127L4/3pcs/12v, 0.6A
Ipass cable	Amphenol	-	SAS cable with 2 port external bracket
RAID	Supermicro	AOC-SAS2LP-H8iR	1.10

ENCLOSURE

The EUT #1enclosure is primarily constructed of metal. It measures approximately 44 cm wide by 71 cm deep by 17.5 cm high.
The EUT #2enclosure is primarily constructed of metal. It measures approximately 44 cm wide by 66 cm deep by 17.5 cm high.
The EUT #3enclosure is primarily constructed of metal. It measures approximately 44 cm wide by 66 cm deep by 13.5 cm high.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for testing:

Emissions and Surge testing

Company	Model	Description	Serial Number	FCC ID
None	-	-	-	-

All other immunity tests

Company	Model	Description	Serial Number	FCC ID
-	-	JBODS	-	-
Samsung	BX2231	monitor	Z2PNHCKB102753	-
Viewsonic	VA903B	monitor	Q87064103070	-
NEC	MultisyncLCD1550V-BK	monitor	2600635TA	-
Microsoft	X802382	mouse	56180-5235092586-4	-
Logitech	Y-U0009	keyboard	-	-

No remote support equipment was used during testing.

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded/Unshielded	Length (m)
2x RJ-45	loopback	Multi-wire	unshielded	>3
2xExternal SAS	JBODS	Multi-wire	shielded	<3
AC Power	AC Mains	Multi-wire	unshielded	2

Note: The keyboard, monitor, and mouse ports were not connected during emissions testing. The manufacturer stated that these are for maintenance purposes and therefore would not normally be connected.

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded/Unshielded	Length (m)
USB	Mouse	Multi-wire	shielded	1.0
USB	Keyboard	Multi-wire	shielded	1.0
Video (x3)	Monitor (x3)	Multi-wire	shielded	1.0
2x RJ-45	loopback	Multi-wire	unshielded	>3
2xExternal SAS	JBODS	Multi-wire	shielded	<3
AC Power	AC Mains	Multi-wire	unshielded	2.0

Note: The keyboard, monitor, and mouse ports were only connected during immunity testing. The manufacturer stated that these are for maintenance purposes and therefore would not normally be connected.

EUT OPERATION

During emissions testing the EUT shall continue to scroll "H" pattern to the VGA port. The EUT was also exercising the Burn-In Diagnostic Software.

During immunity test the EUT was exercised by having the scrolling "H" pattern keep showing on the screen.
Normal operation is indicated by having the scrolling "H" pattern keep showing on the screen and shall be monitored by the Burn-In Diagnostic Software.

The performance criteria applied during immunity testing were:

Criterion A:
During and after testing the EUT shall continue to have the scrolling "H" pattern keep showing on the screen

Criterion B:
During application of the transient test, degradation of performance including the scrolling "H"s may disappear briefly provided that the EUT self-recovers to normal operation after testing without any operator intervention.

Criterion C:
Loss of function is allowed provided that normal operation can be restored by operator intervention.

EMISSIONS TESTING

RADIATED AND CONDUCTED EMISSIONS

Final test measurements were taken at the Elliott Laboratories Anechoic Chambers listed below. The test sites contain separate areas for radiated and conducted emissions testing. The sites conform to the requirements of ANSI C63.4: 2003 *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz* and CISPR 16-1-4:2007 - *Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus Ancillary equipment Radiated disturbances*. They are registered with the VCCI and are on file with the FCC and Industry Canada.

Site	Registration Numbers			Location
	VCCI	FCC	Canada	
Chamber 4	R-1684 G-57 T-1640	211948	IC 2845B-4	41039 Boyce Road Fremont, CA 94538-2435
Chamber 7	C-3759	A2LA accredited	IC 2845B-7	

RADIATED EMISSIONS CONSIDERATIONS

Radiated emissions measurements were made with the EUT powered from a supply voltage within the expected tolerances of each nominal operating voltage/frequency for each geographical regions covered by the scope of the standards referenced in this report.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions tests are performed in conformance with ANSI C63.4, CISPR 22, and Subpart B of Part 15 of FCC Rules for Digital Devices.

Mains port measurements are made with the EUT connected to the public power network through nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

Telecommunication port measurements are made with the unshielded network cable connected through an impedance stabilization network (ISN) appropriate to the type of cable employed. Where no suitable ISN is available measurements are made using a capacitive voltage probe (CVP) and a current probe. If shielded cables are specified for the port under test the measurement is made of the noise voltage on the shield of the cable via a 100 ohm resistor.

HARMONIC CURRENT EMISSIONS, VOLTAGE FLUCTUATIONS AND FLICKER

Testing was performed at the Elliott Laboratories test site located at 41039 Boyce Road, Fremont, CA 94538-2435.

EMISSIONS MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1:2006 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 7 GHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000 MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.

INSTRUMENT CONTROL COMPUTER

Measurements are converted to the field strength at an antenna or voltage developed at the LISN (or ISN) measurement port, which is then compared directly with the appropriate specification limit under software control of the test receivers and spectrum analyzers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted emission measurements utilize a fifty micro-Henry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250-uH CISPR adapter. This network provides for calibrated radio-frequency noise measurements by the design of the internal low-pass and high-pass filters on the EUT and measurement ports, respectively.

IMPEDANCE STABILIZATION NETWORK (ISN)

Telecommunication port conducted emission measurements utilize an Impedance Stabilization Network with a 150-ohm termination impedance and specific longitudinal conversion loss as the voltage monitoring point. This network provides for calibrated radio-frequency noise measurements by the design of the internal circuitry on the EUT and measurement ports, respectively. For current measurements, a current probe with a uniform frequency response and less than 1-ohm insertion impedance is used.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high-amplitude transient events.

ANTENNAS

A bilog antenna or combination of biconical and log periodic antennas are used to cover the range from 30 MHz to 1000 MHz. Narrowband tuned dipole antennas may be used over the entire 30 to 1000 MHz frequency range for precision measurements of field strength. Above 1000 MHz, horn antennas are used. The antenna calibration factors are included in site factors that are programmed into the test receivers or data collection software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor drive to vary the antenna height.

ANSI C63.4 and CISPR 22 specify that the test height above ground for table-mounted devices shall be 80 centimeters. Floor-mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material up to 12-mm thick if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

HARMONICS ANALYZER SYSTEM

A California Instruments CTS system is used for current and voltage harmonics measurements. The system is capable of performing the analysis of both current and voltage harmonics required by EN 61000-3-2. The AC power source integrated into the test system complies with the source voltage harmonic requirements EN 61000-3-2.

VOLTAGE FLUCTUATIONS MEASUREMENT SYSTEM

A California Instruments CTS system is used for voltage fluctuations measurements. The system is capable of performing the short-term and long-term flicker severity calculations in accordance with the requirements of EN 61000-3-3. The AC power source integrated into the test system complies with the source impedance requirements EN 61000-3-3.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the company's specifications. An appendix of this report contains the list of test equipment used and calibration information.

EMISSIONS TEST PROCEDURES

EUT AND CABLE PLACEMENT

The standards require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4 and CISPR 22, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS (MAINS)

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest-amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak-mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord. Emissions that have peak values close to the specification limit are also measured in the quasi-peak and average detection modes to determine compliance except when the amplitude of the emission when measured with the quasi-peak detector is more than 10 dB below the specification limit for average measurements. In this case only quasi-peak measurements are performed.

CONDUCTED EMISSIONS (TELECOMMUNICATION PORTS)

Conducted emissions voltages are measured at a point 80 cm from the EUT. If conducted emission currents are measured, the current probe is located 70 cm from the EUT. Preliminary measurements are made to determine the highest-amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak-mode scan is then performed in the position and mode for which the highest emission was noted. Emissions that have peak values close to the specification limit are also measured in the quasi-peak and average detection modes to determine compliance except when the amplitude of the emission when measured with the quasi-peak detector is more than 10 dB below the specification limit for average measurements. In this case only quasi-peak measurements are performed.

RADIATED EMISSIONS (SEMI-ANECHOIC TEST ENVIRONMENT)

Radiated emissions measurements in a semi-anechoic environment are performed in two phases (preliminary scan and final maximization).

Preliminary Scan

A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed from 30 MHz up to the frequency required by the regulations specified on page 1. One or more of these are performed with the antenna polarized vertically and one or more of these are performed with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit. A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions if required. Other methods used during the preliminary scan for EUT emissions involve scanning with near-field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final Maximization

During final maximization, the highest-amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth that results in the highest emission is then maintained while varying the antenna height from one to four meters. The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain. Emissions that have values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

For measurements above 1 GHz every effort is made to ensure the EUT remains within the cone of radiation of the measurement antenna (i.e. 3 dB beam-width of the antenna). This may include rotating the product and/or angling the measurement antenna.

When Testing above 18 GHz, the receive antenna is located at 1 meter from the EUT and the antenna height is restricted to a maximum of 2.5 m. Maximum emissions are found within this restricted range because emission levels decrease over distance and as the antenna is raised above 2.5 m, the distance from the EUT increases. As a result of the increased measurement distance, at antenna heights above 2.5 m, lower emission levels are measured as compared to emissions levels measured at antenna heights at 2.5 m and below.

RADIATED EMISSIONS (FREE-SPACE TEST ENVIRONMENT)

Anechoic material is placed on the floor between the EUT and the measurement antenna and behind the EUT to ensure that the test site complies with the requirements of CISPR 16 for measurements of radiated field strength above 1 GHz in a free-space environment.

The measurements are made in two phases (preliminary scan and final maximization).

Preliminary Scan

A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in one or more given modes of operation. Scans are performed from 1 GHz up to the frequency required with the antenna polarized vertically and repeated with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360° with the measurement antenna set at a height equal to the center height of the EUT. If necessary additional scans are performed with the antenna height adjusted up and down to ensure the measurement antenna illuminates the entire height of the EUT. A peak detector is used for the preliminary scan and results compared to the average limit.

Final Maximization

During final maximization, the highest-amplitude emissions identified in the preliminary scan are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. For small EUT fitting within the beam-width of the measurement antenna, the azimuth resulting in the highest emission is the maintained, and the measurement antenna is positioned at a fixed height for final measurements.

For large EUT not fitting within the beam-width of the measurement antenna, the azimuth that results in the highest emission is then maintained while varying the antenna height from one meter up to the height of the top of the EUT (when necessary). A second rotation of the EUT at the new height may be performed to ensure the highest field strength is obtained.

Peak and average measurements are made of the signal with the level maximized for EUT azimuth and, where necessary, antenna height. Each recorded level is corrected by test software using appropriate factors for cables, connectors, antennas, and preamplifier gain.

HARMONIC CURRENT EMISSIONS

Harmonic current emissions are measured with the EUT operating as detailed in Appendix C of EN 61000-3-2. The operating requirements for Information Technology Equipment (ITE) are that the EUT be configured to its rated current. For some types of ITE equipment this may necessitate the use of additional (resistive) cards.

VOLTAGE FLUCTUATIONS AND FLICKER

Voltage fluctuations and flicker measurements are made with the EUT operating as detailed in Appendix A of EN 61000-3-3:. The operating requirements for consumer electronics equipment are that the EUT be configured to produce the most unfavorable sequence of voltage fluctuations.

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form). The calculation is as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV
S = Specification Limit in dBuV
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements. A distance factor, when used for electric field measurements, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m
F_d = Distance Factor in dB
R_c = Corrected Reading in dBuV/m
L_s = Specification Limit in dBuV/m
M = Margin in dB Relative to Spec

IMMUNITY TESTING

GENERAL INFORMATION

Final tests were performed at the Elliott Laboratories Test Sites located at41039 Boyce Road, Fremont, CA 94538-2435. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent CENELEC and IEC standards.

All immunity tests were performed with the host system operating from an AC source voltage within the operating ranges specified for the product, meeting the requirement detailed in EN 55024 / CISPR 24 section 6.1.

IMMUNITY MEASUREMENT INSTRUMENTATION

ELECTROSTATIC DISCHARGE TEST SYSTEM

An ESD generator is used for all testing. It is capable of applying electrostatic discharges in both contact discharge mode to 8 kV and air discharge mode to 16.5 kV in both positive and negative polarities in accordance with the IEC/EN 61000-4-2 basic EMC publication.

ELECTROMAGNETIC FIELD TEST SYSTEM

A signal generator and power amplifiers are used to provide a signal at the appropriate power and frequency to an antenna to obtain the required electromagnetic field at the position of the EUT in accordance with the IEC/EN 61000-4-3 basic EMC publication.

ELECTRICAL FAST TRANSIENT/BURST TEST SYSTEM

An electrical fast transient/burst generator is used for all testing. It is capable of applying the required fast transient immunity test levels to the mains at any phase angle with respect to the mains voltage waveform and to attached cables via a capacitive coupling clamp in accordance with the IEC/EN 61000-4-4 basic EMC publication.

SURGE TEST SYSTEM

A surge generator is used for all testing. It is capable of providing the required surge immunity test levels to the mains port at any phase angle with respect to the mains line voltage waveform or to the signal port in accordance with the IEC/EN 61000-4-5 basic EMC publication.

For I/O line surges a surge coupling network is used to couple the output from the generator to the I/O lines. The generator can generate the CWG (1.2/50 µS) and CCITT (70/100 µS) waveforms as required by the IEC/EN 61000-4-5 basic standard.

CONDUCTED INTERFERENCE TEST SYSTEM

A signal generator and power amplifier are used to provide a signal at the appropriate power and frequency through a coupling network to obtain the required electromagnetic signal on the power cord and attached cables of the EUT in accordance with the IEC/EN 61000-4-6 basic immunity standard.

VOLTAGE VARIATION TEST SYSTEM

A power-line disturbance simulator and variable transformer are used for all testing. These two units are, when used together, capable of simulating mains voltage variations between 0 and 100% for periods up to 100 seconds in duration in accordance with the IEC/EN 61000-4-11 basic EMC standard.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the company's specifications. An appendix of this report contains the list of test equipment used and calibration information.

IMMUNITY TEST PROCEDURES

EQUIPMENT PLACEMENT

The basic standards for evaluating immunity to electrostatic discharges specify that a tabletop EUT shall be placed on a non-conducting table 80 centimeters above a ground reference plane and that floor-mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement. For tabletop equipment, a 1.6 by 0.8 meter metal sheet is placed on the table and connected to the ground plane via a metal strap with two 470-kOhm resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material.

The basic standards for evaluating immunity to radiated electric fields specify that a tabletop EUT be placed on a non-conducting table 80 centimeters high and that floor-mounted equipment may be mounted on non-conductive supports 0.05 to 0.15 m high. During the tests, the EUT is positioned in a shielded anechoic test chamber to reduce reflections from the internal surfaces of the chamber.

The basic standards for evaluating immunity electrically fast transient bursts specify that the EUT and attached cables be placed on an insulating support 10 centimeters above a ground reference plane. During the tests, the EUT was positioned on a table with a ground reference plane or on the floor in conformance with this requirement.

The basic standards for evaluating immunity to surge transients do not specify positioning of the EUT. The EUT was therefore placed on a table or on the floor.

The basic standards for evaluating immunity to conducted rf disturbances specify that the EUT be placed on an insulating support 10 centimeters above a ground reference plane and that the attached cables be maintained between 30 and 50 millimeters above this plane where possible. During the tests, the EUT was positioned on a table with a ground reference plane or on the floor in conformance with this requirement.

The basic standards for evaluating immunity to voltage dips and interruptions do not specify positioning of the EUT. The EUT was therefore placed on a table or on the floor.

APPLICATION OF ELECTROSTATIC DISCHARGES

The points of application of the test discharges directly to the EUT are determined after consideration of the parts of the EUT that are accessible to the operator during normal operation. Contact and air discharges are applied to the EUT, contact discharges to conducting surfaces and air-gap discharges to insulating surfaces. Contact discharges are also applied to the coupling planes to simulate nearby ESD events.

APPLICATION OF ELECTROMAGNETIC FIELD

The electromagnetic field is established at the front edge of the EUT.

The frequency range is swept through the frequency range of the test using a power level necessary to obtain the required field strength at the EUT. The field is amplitude modulated using a 1 kHz sine wave to a depth of 80% for the swept frequency test in accordance with the applicable basic standard(s).

The test is repeated with each of the four sides of the EUT facing the field-generating antenna. For small, portable products the test is also performed with the top and bottom sides of the EUT facing the antenna.

APPLICATION OF ELECTRICAL FAST TRANSIENTS

The application of the test voltage to the EUT is made to the cable connected to the power port under test via discrete capacitors and through a capacitive coupling clamp in the case of cables connected to signal ports.

APPLICATION OF SURGES

The application of the surge to the EUT's AC or DC power port is made to the power cable attached to the unit via the coupling/decoupling network within the surge generator.

For coupling to unshielded signal lines a coupling network is used to give the correct coupling path (resistor and capacitor/spark gap) to the line under test. Coupling to shielded signal lines is made directly to the shield at the far end of the cable, with the cable length set to the shorter of 20 m or the maximum specified cable length. Whenever possible a decoupling network is placed in series with the I/O line under test and the support equipment to ensure that any susceptibility observed is due to the EUT and not the support equipment. Decoupling networks are not available for high-speed signal lines.

APPLICATION OF CONDUCTED INTERFERENCE

The application of the test voltage to the EUT is made through either a coupling-decoupling network (CDN), by direct injection, or through an inductive coupling clamp as appropriate to the cable being tested. The frequency range is swept from 0.15 to 80 MHz using a power level necessary to obtain the specified interference voltage.

APPLICATION OF VOLTAGE VARIATIONS

The applications of the variations in mains voltage to the EUT are made through the AC power cable attached to the unit.

Appendix A Test Equipment Calibration Data

Harmonics and Flicker, 04-Apr-12 and 11-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
California Instruments	Harmonics & Flicker test System	5001ix , AC Power Source	2157	7/13/2012
California Instruments	Harmonics & Flicker Power Unit	PACS-1	2158	7/13/2012

Conducted Emissions - AC Power Ports, 12-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	4/21/2012
Fischer Custom Comm.	LISN, 50uH, 25 Amps, Dual Line	FCC-LISN-50/250-25-2-01	1575	2/16/2013
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	5/25/2012
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2000	10/18/2012
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2001	2/15/2013

Radiated Emissions, 30 - 15,000 MHz, 14-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/6/2012
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	6/24/2012
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	2/23/2013
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	2415	7/28/2012
Hewlett Packard	9KHz-1300MHz pre-amp	8447F	2328 CG0177	3/16/2013

Radiated Emissions, CISPR22 HF, 1000 - 6,000 MHz, 15-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	2/23/2013
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	2415	7/28/2012

Conducted Emissions - Telecommunications Ports, 14-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/6/2012
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/17/2012
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2000	10/18/2012
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2001	2/15/2013
Fischer Custom Comm.	FCC-TLISN-T8-02 (Includes 2183)	FCC-TLISN-T8-02-09	2182	7/26/2013

Radiated Immunity, 80 - 1,000 MHz, 13-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Sensor, 1 uW-100 mW, DC-18 GHz, 50ohms	NRV-Z51	1070	5/25/2012
Amplifier Research	Field Probe, RF, 10 KHz - 1GHz	FP4000	1430	8/31/2012
Werlatone	Directional Coupler, 0.1-1000 MHz, 40dB, 500w	C6021	1533	N/A
Instruments For Industry	IFI Amplifier 80 - 1000 MHz (200W CW)	CMC-200	1546	N/A
ETS Lindgren	Biconilog Antenna 26 MHz - 3 GHz, Radiated Immunity Only	3140B	1775	N/A
Rohde & Schwarz	Power Meter, Dual Channel, DC to 40 GHz, 100 pW to 30 W, 9 kHz to 3 GHz, 200µV to 1000V	NRVD	1787	1/5/2013
Agilent	MXG Analog Signal Generator	N5181A	2146	1/27/2013

VDI, 16-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
Fluke Mfg. Inc.	Fluke Mulitmeter, True RMS	175	1447	7/14/2012
EM Test AG	VDI Generator	UCS 500 M6	1585	7/19/2012

EFT, 16-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
Amplifier Research	EFT/B Capacitive Coupling clamp	EM Test / C ClampHFK	1583	N/A
EM Test AG	EFT Generator	UCS 500 M6	1585	7/22/2012
FCC	Decoupling Network	F-203I-DCN-23mm	2457	N/A

Conducted Immunity (IEC/EN/KN 61000-4-6), 17-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Signal Generator, 9 kHz-1.04 GHz	SMY01	168	11/4/2012
Instruments For Industry	Amplifier, Wideband, 0.01-230MHz	M75	1295	7/1/2012
Bird Electronics Corp.	Attenuator, 100 Watt ,6 dB	100-SA-FFN-06	1397	11/10/2012
Fischer Custom Comm.	EM Clamp 10 KHz - 1 GHz	F-203I-32MM	1566	10/4/2012
Fischer Custom Comm.	M3 Network, 150 kHz-230 MHz	FCC-801-M3-25A	1578	5/13/2012
Fischer Custom Comm.	M3 Network, 150 kHz-230 MHz	FCC-801-M3-25A	1579	5/13/2012
Fischer Custom Comm.	M3 Network, 150 kHz-230 MHz	FCC-801-M3-25A	1581	5/16/2012
Rohde & Schwarz	Power Meter, Dual Channel, DC to 40 GHz, 100 pW to 30 W, 9 kHz to 3 GHz, 200µV to 1000V	NRVD	1786	2/24/2013
FCC	Decoupling Network	F-203I-DCN-23mm	2457	N/A

ESD, 17-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
Elliott Laboratories	ESD, Vertical Plane, 19-3/4 x 19-3/4	ESD, VP, 19-3/4 x 19-3/4	610	N/A
Schaffner	ESD Gun, 150pF-330 ohm tip	NSG-438	2508	12/20/2012

Surge , 17-Apr-12

Manufacturer	Description	Model	Asset #	Cal Due
KeyTek	ECAT - Short Stack, EClass Series 100	ECAT Control Center	1789	5/10/2012
KeyTek	ECAT - Short Stack, Mains (Surge) Coupler/Decoupler 8kV max	E4554KV, ECAT	1819	3/11/2013

Appendix B Test Data

AC current harmonics test data and voltage fluctuations test data are contained in separate appendices of this report.

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Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Emissions Standard(s):	FCC Part15B, EN 55022, VCCI	Class:	A
Immunity Standard(s):	EN 55024	Environment:	

EMC Test Data

For The

Supermicro Computer, Inc.

Model

Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)

Date of Last Test: 4/17/2012

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Conducted Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/12/2012
Test Engineer: Alika Hirano
Test Location: Fremont Chamber #7
Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment.

Ambient Conditions:

Temperature: 18 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 230V/50Hz	Class A	Pass	36.8 dBµV @ 0.301 MHz (-29.2 dB)
2	CE, AC Power, 230V/50Hz	Class A	Pass	53.1 dBµV @ 0.679 MHz (-6.9 dB)
3	CE, AC Power,120V/60Hz	Class A	Pass	34.3 dBµV @ 0.798 MHz (-25.7 dB)
4	CE, AC Power,120V/60Hz	Class A	Pass	48.1 dBµV @ 0.721 MHz (-11.9 dB)

Modifications Made During Testing

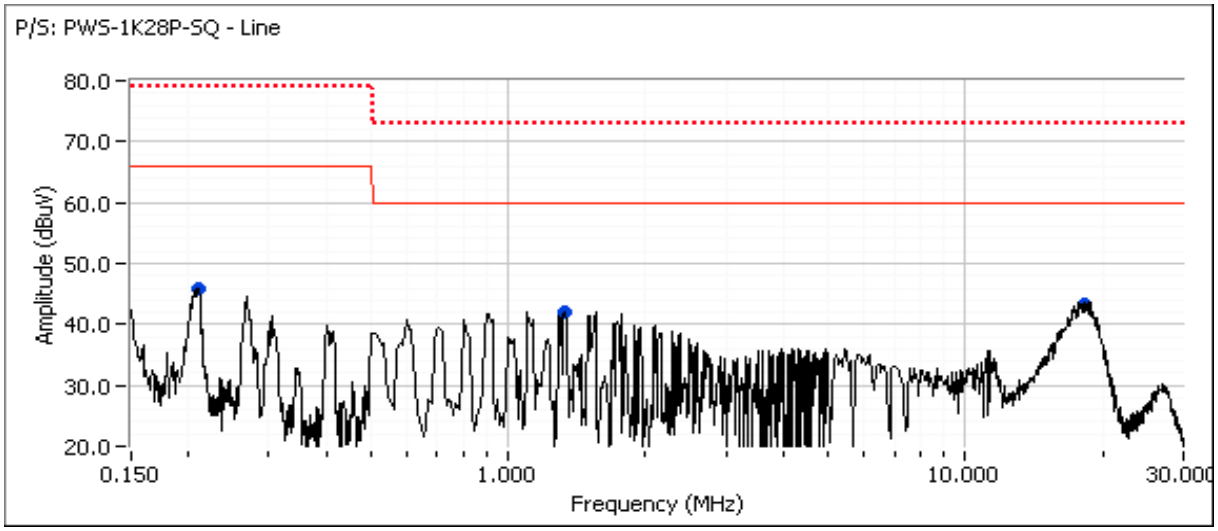
No modifications were made to the EUT during testing

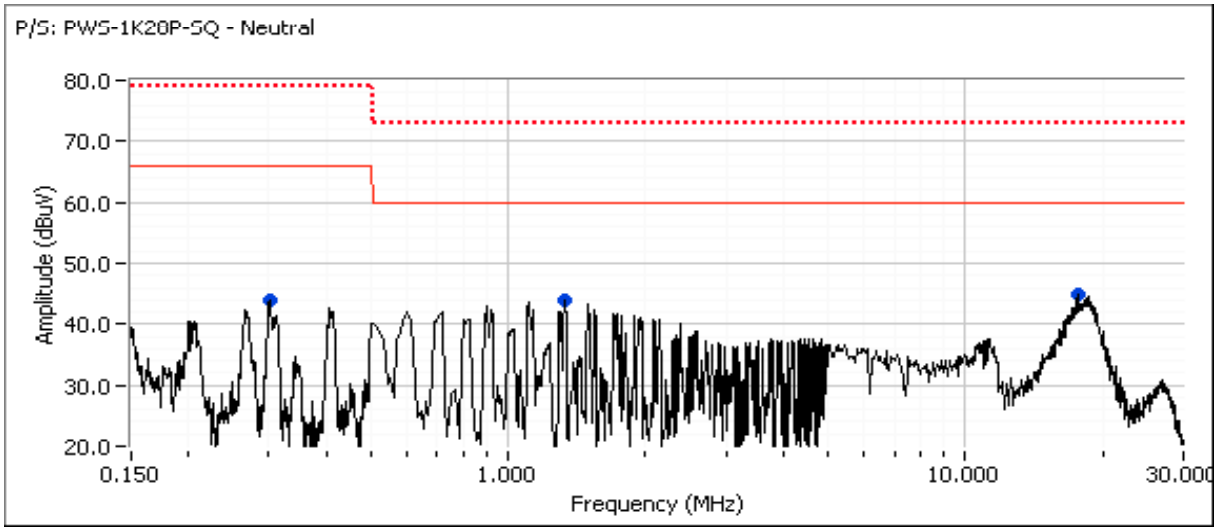
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz (P/S: PWS-1K28P-SQ)





Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

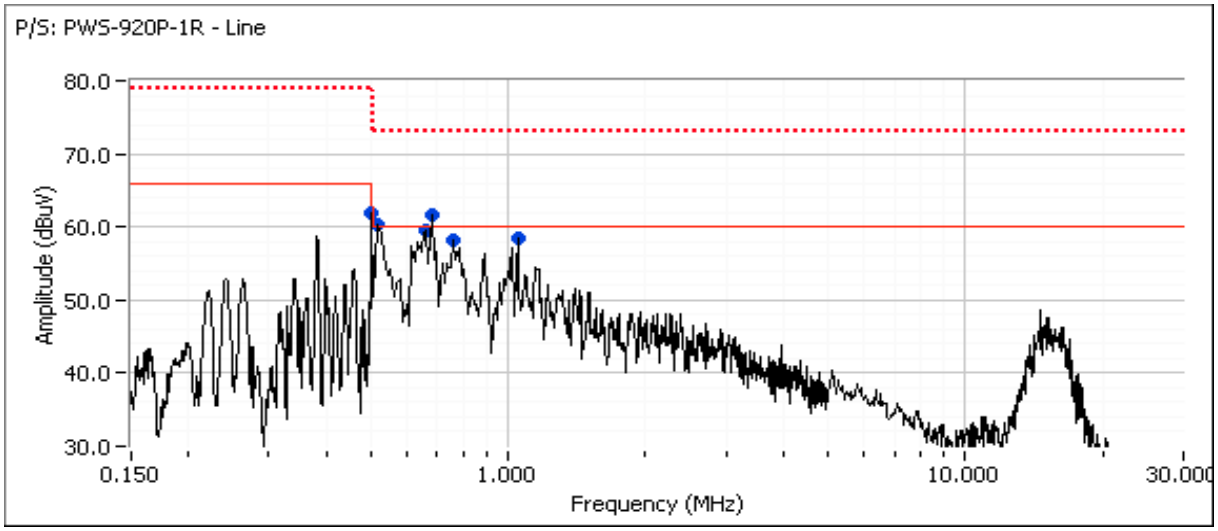
Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.210	45.9	Line 1	66.0	-20.1	Peak	
1.332	42.1	Line 1	60.0	-17.9	Peak	
18.339	43.3	Line 1	60.0	-16.7	Peak	
0.301	43.9	Neutral	66.0	-22.1	Peak	
1.322	43.9	Neutral	60.0	-16.1	Peak	
17.681	45.0	Neutral	60.0	-15.0	Peak	

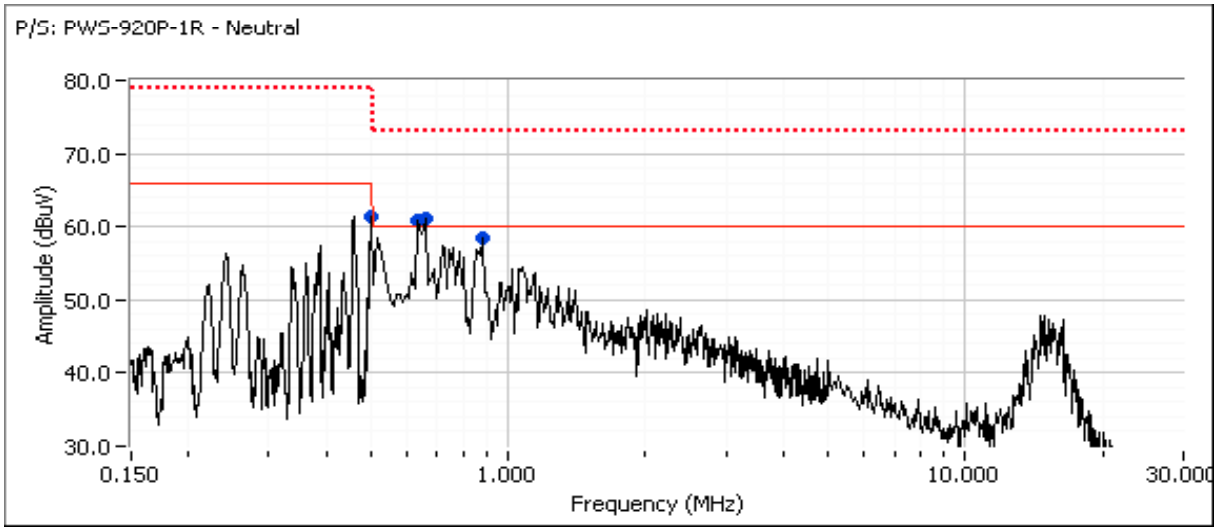
Final quasi-peak and average readings

Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.301	36.8	Neutral	66.0	-29.2	AVG	AVG (0.10s)
1.332	30.7	Line 1	60.0	-29.3	AVG	AVG (0.10s)
0.210	35.9	Line 1	66.0	-30.1	AVG	AVG (0.10s)
1.322	29.6	Neutral	60.0	-30.4	AVG	AVG (0.10s)
17.681	29.1	Neutral	60.0	-30.9	AVG	AVG (0.10s)
18.339	28.8	Line 1	60.0	-31.2	AVG	AVG (0.10s)
1.322	41.5	Neutral	73.0	-31.5	QP	QP (1.00s)
1.332	40.6	Line 1	73.0	-32.4	QP	QP (1.00s)
18.339	40.2	Line 1	73.0	-32.8	QP	QP (1.00s)
17.681	40.2	Neutral	73.0	-32.8	QP	QP (1.00s)
0.210	42.4	Line 1	79.0	-36.6	QP	QP (1.00s)
0.301	41.6	Neutral	79.0	-37.4	QP	QP (1.00s)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz (P/S: PWS-920P-1R)





Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

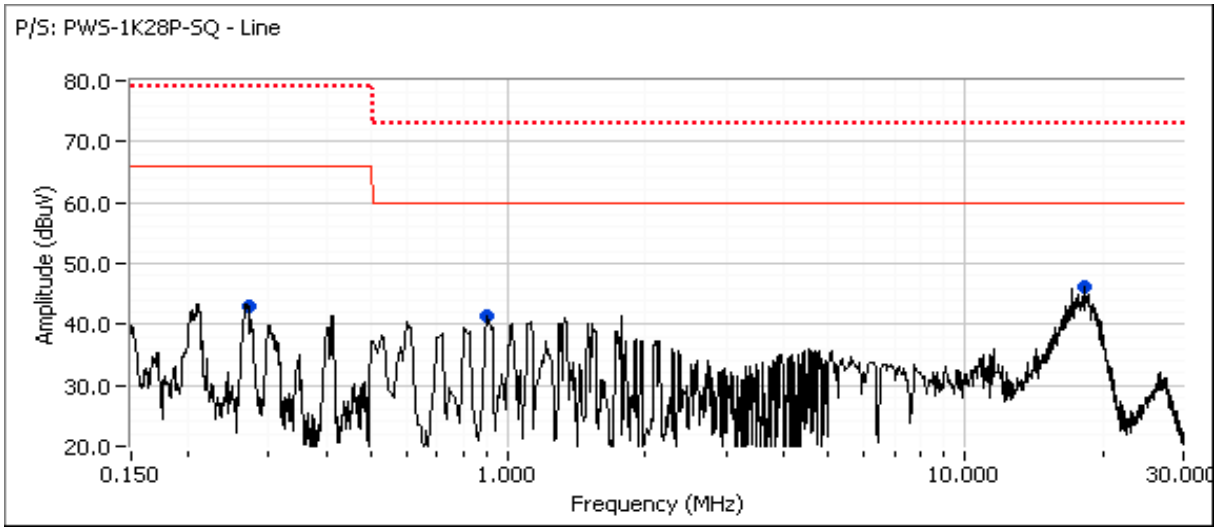
Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.500	61.9	Line 1	66.0	-4.1	Peak	
0.522	60.4	Line 1	60.0	0.4	Peak	
0.658	59.6	Line 1	60.0	-0.4	Peak	
0.679	61.7	Line 1	60.0	1.7	Peak	
0.761	58.2	Line 1	60.0	-1.8	Peak	
1.047	58.4	Line 1	60.0	-1.6	Peak	
0.500	61.3	Neutral	66.0	-4.7	Peak	
0.642	60.8	Neutral	60.0	0.8	Peak	
0.658	61.2	Neutral	60.0	1.2	Peak	
0.877	58.5	Neutral	60.0	-1.5	Peak	

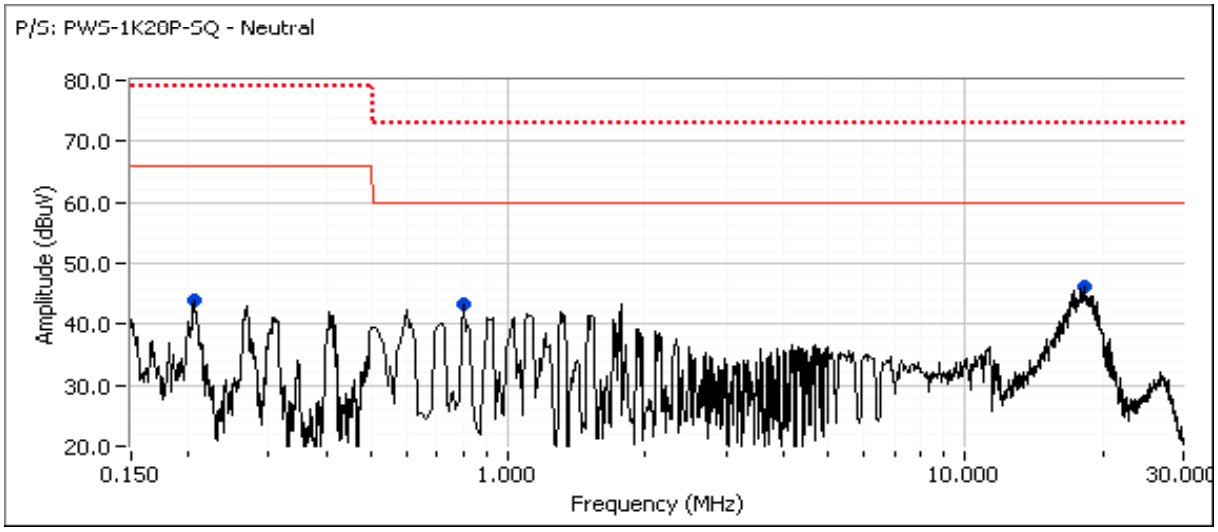
Final quasi-peak and average readings

Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.679	53.1	Line 1	60.0	-6.9	AVG	AVG (0.10s)
0.642	52.5	Neutral	60.0	-7.5	AVG	AVG (0.10s)
0.522	52.1	Line 1	60.0	-7.9	AVG	AVG (0.10s)
0.761	51.8	Line 1	60.0	-8.2	AVG	AVG (0.10s)
0.658	51.7	Neutral	60.0	-8.3	AVG	AVG (0.10s)
0.658	51.6	Line 1	60.0	-8.4	AVG	AVG (0.10s)
0.500	54.7	Neutral	66.0	-11.3	AVG	AVG (0.10s)
0.679	61.6	Line 1	73.0	-11.4	QP	QP (1.00s)
0.500	54.1	Line 1	66.0	-11.9	AVG	AVG (0.10s)
0.642	59.5	Neutral	73.0	-13.5	QP	QP (1.00s)
0.658	59.5	Neutral	73.0	-13.5	QP	QP (1.00s)
0.658	59.4	Line 1	73.0	-13.6	QP	QP (1.00s)
0.877	46.0	Neutral	60.0	-14.0	AVG	AVG (0.10s)
0.522	58.7	Line 1	73.0	-14.3	QP	QP (1.00s)
1.047	44.8	Line 1	60.0	-15.2	AVG	AVG (0.10s)
0.761	57.4	Line 1	73.0	-15.6	QP	QP (1.00s)
0.500	62.1	Neutral	79.0	-16.9	QP	QP (1.00s)
0.500	61.7	Line 1	79.0	-17.3	QP	QP (1.00s)
0.877	54.4	Neutral	73.0	-18.6	QP	QP (1.00s)
1.047	51.5	Line 1	73.0	-21.5	QP	QP (1.00s)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #3: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz (P/S: PWS-1K28P-SQ)





Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

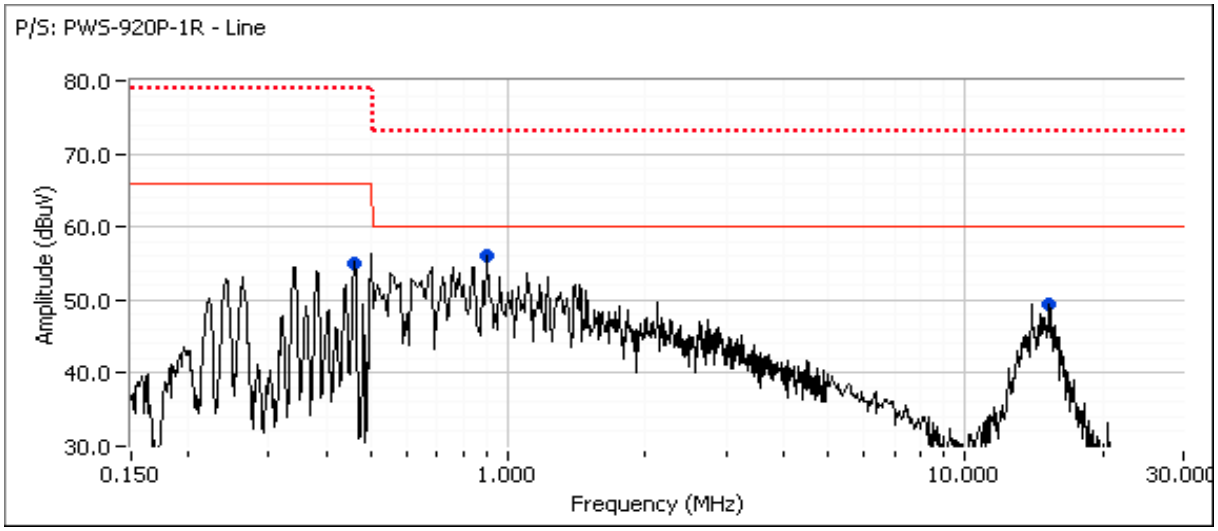
Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.271	42.9	Line 1	66.0	-23.1	Peak	
0.898	41.3	Line 1	60.0	-18.7	Peak	
18.140	46.1	Line 1	60.0	-13.9	Peak	
0.206	43.8	Neutral	66.0	-22.2	Peak	
0.798	43.3	Neutral	60.0	-16.7	Peak	
18.198	46.1	Neutral	60.0	-13.9	Peak	

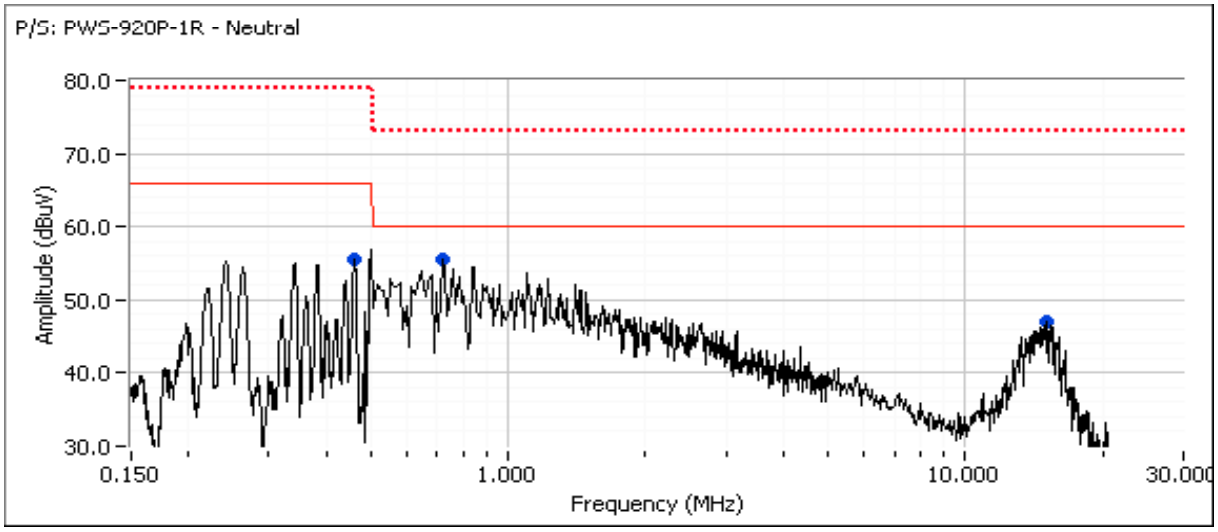
Final quasi-peak and average readings

Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.798	34.3	Neutral	60.0	-25.7	AVG	AVG (0.10s)
18.198	33.3	Neutral	60.0	-26.7	AVG	AVG (0.10s)
0.898	33.1	Line 1	60.0	-26.9	AVG	AVG (0.10s)
18.140	32.3	Line 1	60.0	-27.7	AVG	AVG (0.10s)
0.206	37.6	Neutral	66.0	-28.4	AVG	AVG (0.10s)
18.198	42.1	Neutral	73.0	-30.9	QP	QP (1.00s)
0.271	34.5	Line 1	66.0	-31.5	AVG	AVG (0.10s)
0.798	41.5	Neutral	73.0	-31.5	QP	QP (1.00s)
18.140	41.2	Line 1	73.0	-31.8	QP	QP (1.00s)
0.898	40.8	Line 1	73.0	-32.2	QP	QP (1.00s)
0.206	43.8	Neutral	79.0	-35.2	QP	QP (1.00s)
0.271	37.7	Line 1	79.0	-41.3	QP	QP (1.00s)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #4: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz (P/S: PWS-920P-1R)





Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.462	55.1	Line 1	66.0	-10.9	Peak	
0.898	56.0	Line 1	60.0	-4.0	Peak	
15.294	49.4	Line 1	60.0	-10.6	Peak	
0.461	55.5	Neutral	66.0	-10.5	Peak	
0.721	55.6	Neutral	60.0	-4.4	Peak	
15.080	46.9	Neutral	60.0	-13.1	Peak	

Final quasi-peak and average readings

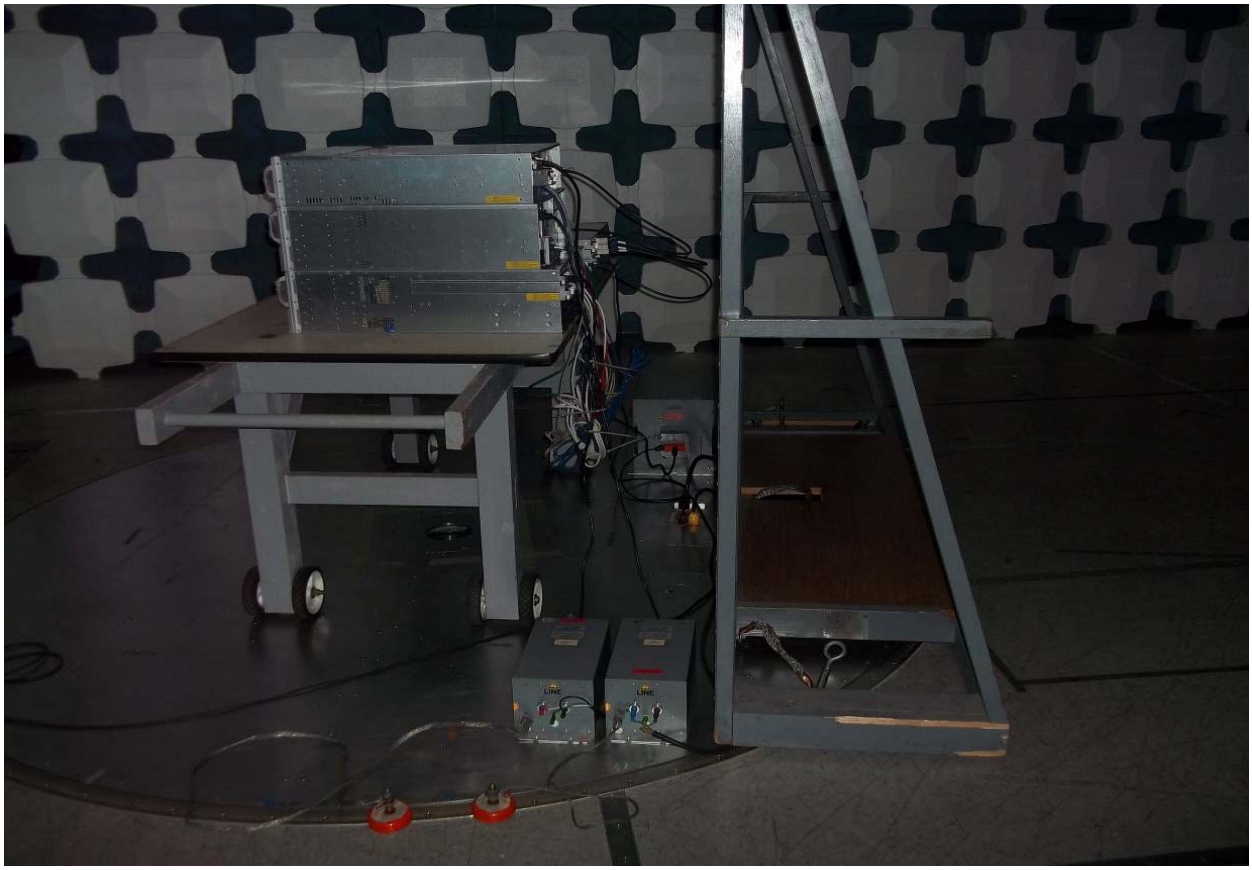
Frequency	Level	AC	Class A		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.721	48.1	Neutral	60.0	-11.9	AVG	AVG (0.10s)
0.898	47.7	Line 1	60.0	-12.3	AVG	AVG (0.10s)
0.461	51.8	Neutral	66.0	-14.2	AVG	AVG (0.10s)
0.462	49.9	Line 1	66.0	-16.1	AVG	AVG (0.10s)
0.721	54.0	Neutral	73.0	-19.0	QP	QP (1.00s)
0.898	53.3	Line 1	73.0	-19.7	QP	QP (1.00s)
0.461	55.1	Neutral	79.0	-23.9	QP	QP (1.00s)
15.080	35.4	Neutral	60.0	-24.6	AVG	AVG (0.10s)
15.294	34.8	Line 1	60.0	-25.2	AVG	AVG (0.10s)
0.462	53.2	Line 1	79.0	-25.8	QP	QP (1.00s)
15.080	44.1	Neutral	73.0	-28.9	QP	QP (1.00s)
15.294	43.8	Line 1	73.0	-29.2	QP	QP (1.00s)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #1
(Conducted Emissions - Power Port)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #2
(Conducted Emissions - Power Port)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Conducted Emissions - Signal Ports

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/14/2012 13:32
Test Engineer: Chris Groat
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: none
EUT Voltage: 230V/50Hz

General Test Configuration

The EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment. Remote support equipment was located approximately 30 meters away from the test area, with all I/O connections running on top of the groundplane.

For conducted current emissions on shielded signal and data leads, a current probe was placed around the interface cable approximately 1 meter from the EUT. The shield was terminated to the ground plane using a 150-ohm resistor, and a ferrite core was placed between the termination network and the support equipment.

For conducted voltage emissions on unshielded signal and data leads, a suitable ISN was placed in series with the cable from the port under test and 80 cm from the device under test. Where no suitable ISN was available, a capacitive voltage probe and a current probe were used to measure the common-mode voltage and current on the cable connected to the port under test.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 34 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, Ethernet Port	Class A	Pass	63.9 dBµV @ 1.763 MHz (-10.1 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #1: Signal Port Conducted Voltage Emissions, 0.15 - 30.0 MHz

Port Under Test: Ethernet

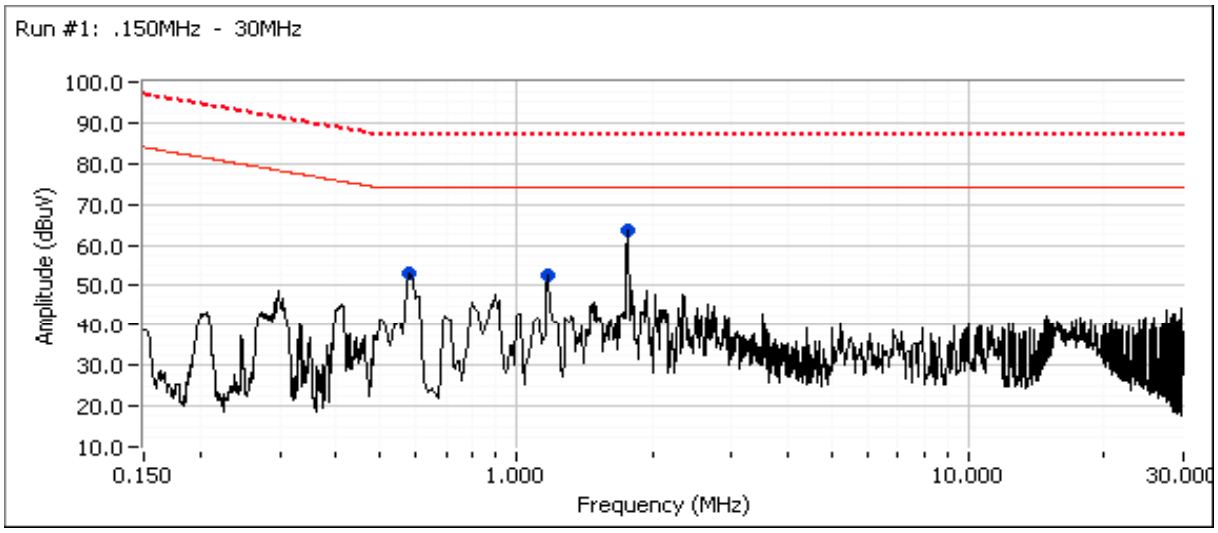
Data Rate: 10/100Mb/s

LAN Utilization: 100% for 10 seconds

Loading software: Burn-In Diagnostic Software

Tested 4U with drives on both sides

ISN Type		Cable Category		ISN specification	
	2-wire		Uncategorized/Cat 3		CISPR 22 Edition 3 / EN 55022:1998
	4-wire	X	Category 5	X	CISPR 22 Edition 4 / Edition 5
X	8-wire		Category 6		



Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

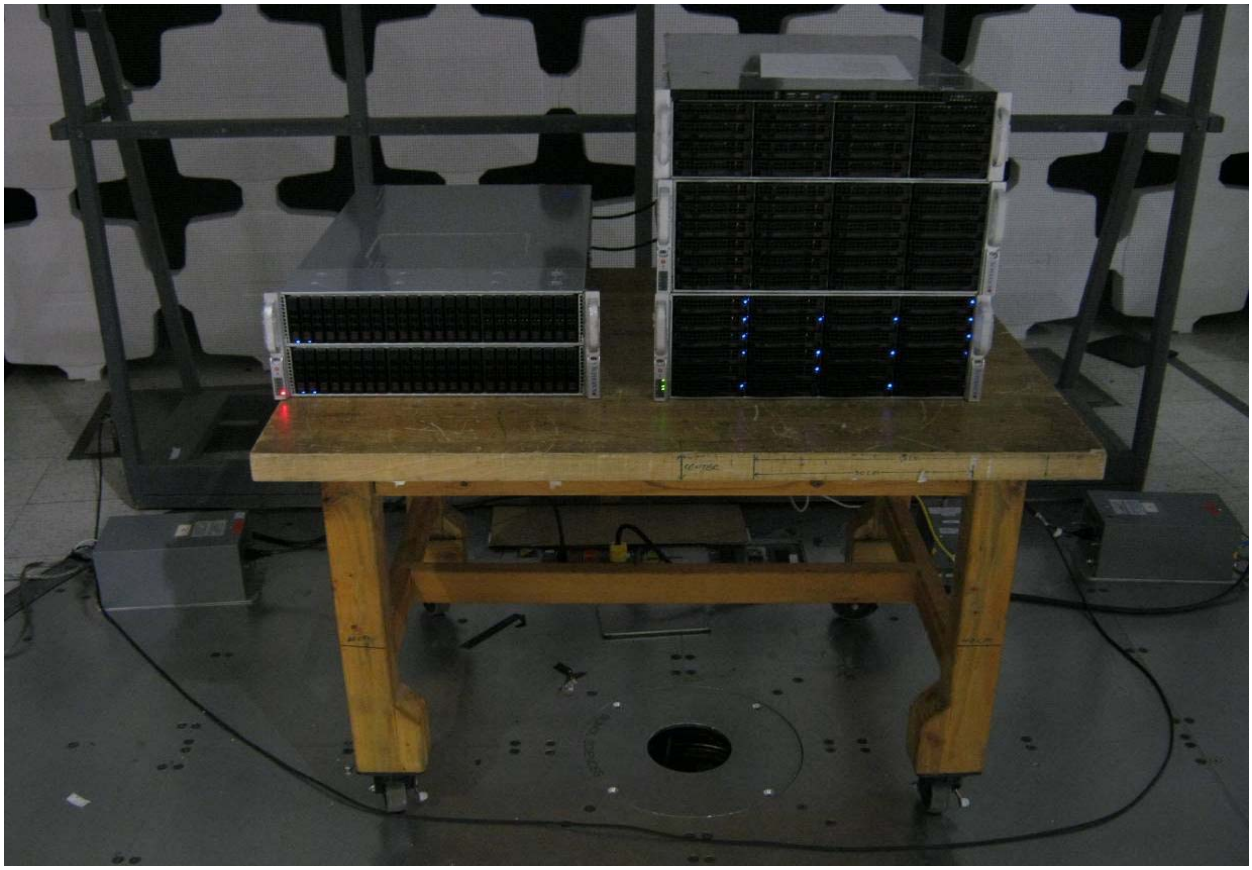
Frequency MHz	Level dBµV	Port Name	Class A Limit	Class A Margin	Detector QP/Ave	Comments
1.763	63.6	Ethernet	74.0	-10.4	Peak	
1.176	52.5	Ethernet	74.0	-21.5	Peak	
0.588	53.2	Ethernet	74.0	-20.8	Peak	

Final quasi-peak and average readings

Frequency MHz	Level dBµV	Port Name	Class A Limit	Class A Margin	Detector QP/Ave	Comments
1.763	63.9	Ethernet	74.0	-10.1	AVG	AVG (0.10s)
1.176	51.9	Ethernet	74.0	-22.1	AVG	AVG (0.10s)
1.763	64.0	Ethernet	87.0	-23.0	QP	QP (1.00s)
0.588	50.5	Ethernet	74.0	-23.5	AVG	AVG (0.10s)
1.176	52.2	Ethernet	87.0	-34.8	QP	QP (1.00s)
0.588	51.7	Ethernet	87.0	-35.3	QP	QP (1.00s)

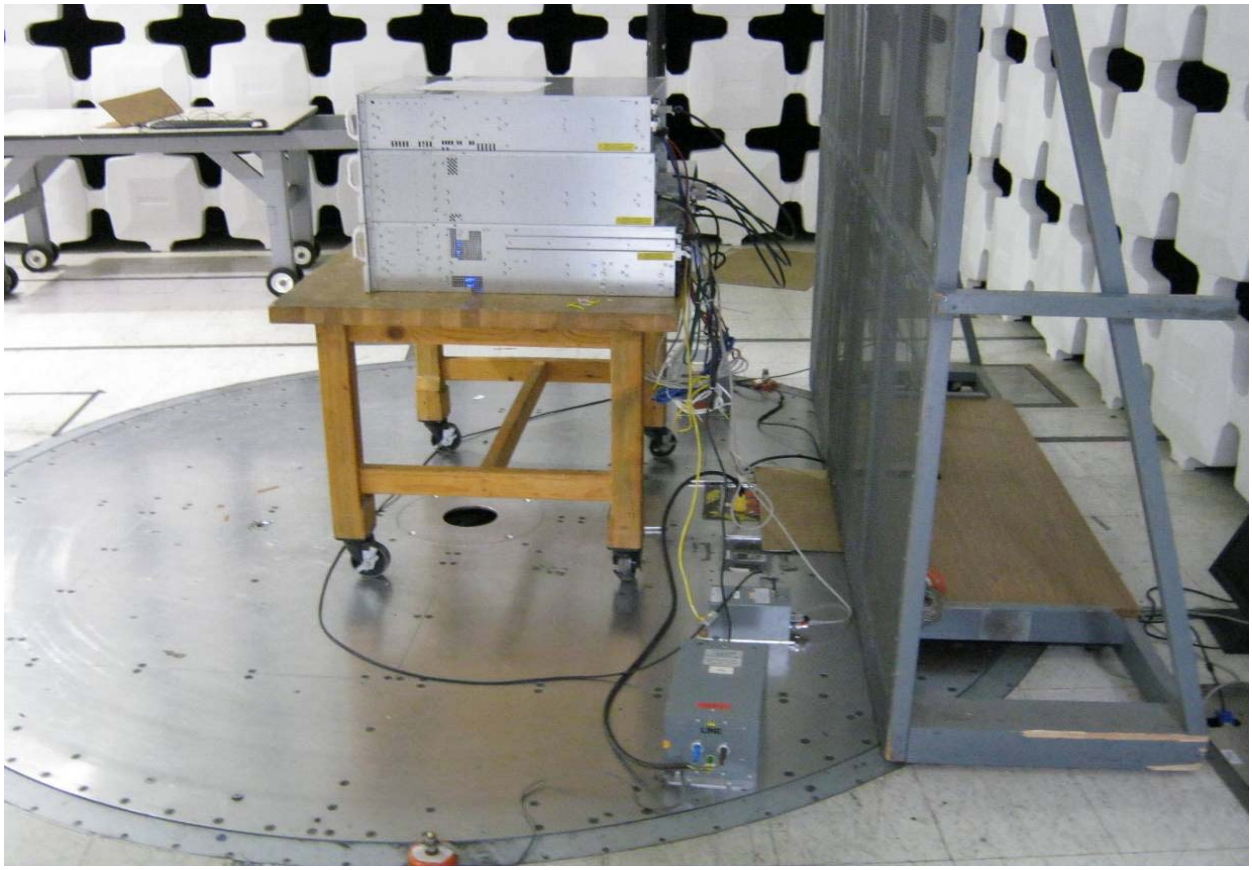
Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #1
(Conducted Emissions - Signal Ports)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #2
(Conducted Emissions - Signal Ports)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Radiated Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/14/2012
Test Engineer: Chris Groat
Test Location: Fremont Chamber #4
Config. Used: 1
Config Change: none
EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 34 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Radiated Emissions 30 - 1000 MHz, Preliminary	Class A	EVAL	Refer to individual runs
2	Radiated Emissions 30 - 1000 MHz, Maximized	Class A	Pass	36.4 dBµV/m @ 150.01 MHz (-3.6 dB)
3	Radiated Emissions 1 GHz - 15 GHz Maximized	FCC Class A	Pass	47.2 dBµV/m @ 6000.0 MHz (-2.3 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

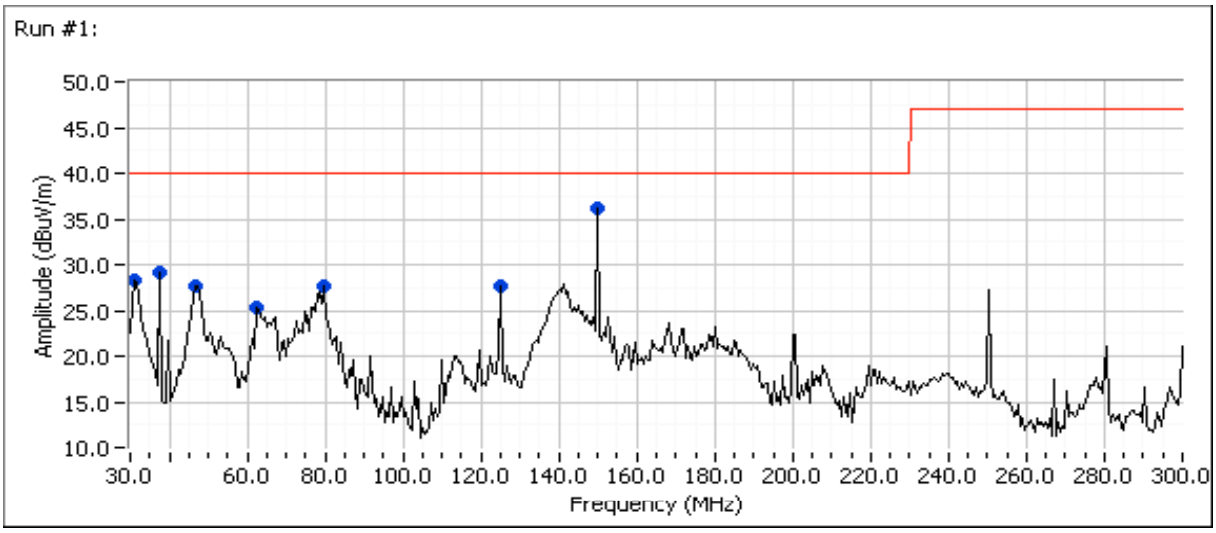
Deviations From The Standard

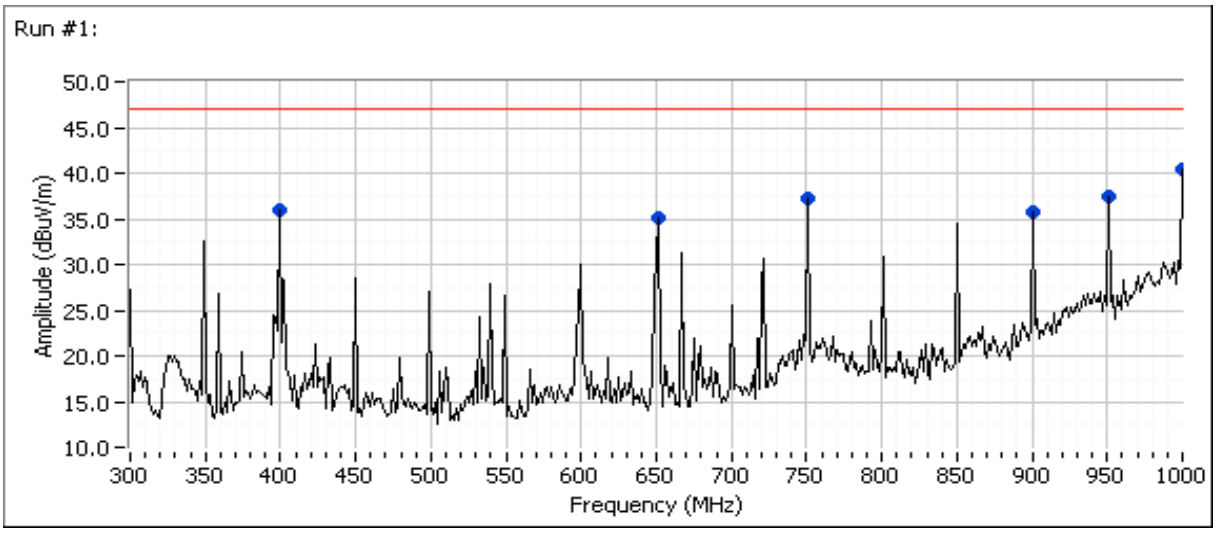
No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0





Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	EN55022 A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
150.006	36.1	H	40.0	-3.9	Peak	274	3.0	
1000.000	40.5	H	47.0	-6.5	Peak	203	1.0	
950.018	37.4	H	47.0	-9.6	Peak	197	1.0	
750.006	37.2	V	47.0	-9.8	Peak	194	1.0	
36.968	29.1	V	40.0	-10.9	Peak	50	1.0	
399.995	36.0	H	47.0	-11.0	Peak	161	1.0	
900.005	35.7	V	47.0	-11.3	Peak	159	1.5	
31.388	28.3	V	40.0	-11.7	Peak	120	1.0	
650.036	35.2	H	47.0	-11.8	Peak	177	1.0	
125.006	27.7	V	40.0	-12.3	Peak	285	1.0	
78.459	27.6	V	40.0	-12.4	Peak	10	1.0	
47.076	27.6	V	40.0	-12.4	Peak	112	1.5	
63.819	25.4	V	40.0	-14.6	Peak	315	3.5	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency	Level	Pol	EN55022 A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
150.006	36.4	H	40.0	-3.6	QP	275	3.0	QP (1.00s)
1000.000	41.9	H	47.0	-5.1	QP	205	1.0	QP (1.00s)
750.006	37.9	V	47.0	-9.1	QP	196	1.0	QP (1.00s)
950.018	36.4	H	47.0	-10.6	QP	196	1.0	QP (1.00s)
900.005	34.0	V	47.0	-13.0	QP	160	1.5	QP (1.00s)
125.006	26.9	V	40.0	-13.1	QP	286	1.0	QP (1.00s)
31.388	26.2	V	40.0	-13.8	QP	121	1.0	QP (1.00s)
650.036	33.2	H	47.0	-13.8	QP	178	1.0	QP (1.00s)
47.076	23.1	V	40.0	-16.9	QP	113	1.5	QP (1.00s)
78.459	19.7	V	40.0	-20.3	QP	8	1.0	QP (1.00s)
399.995	26.4	H	47.0	-20.6	QP	160	1.0	QP (1.00s)
63.819	19.0	V	40.0	-21.0	QP	316	3.5	QP (1.00s)
35.432	15.8	V	40.0	-24.2	QP	51	1.0	QP (1.00s)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #2: Maximized Readings From Run #1
Maximized quasi-peak readings (includes manipulation of EUT interface cables)

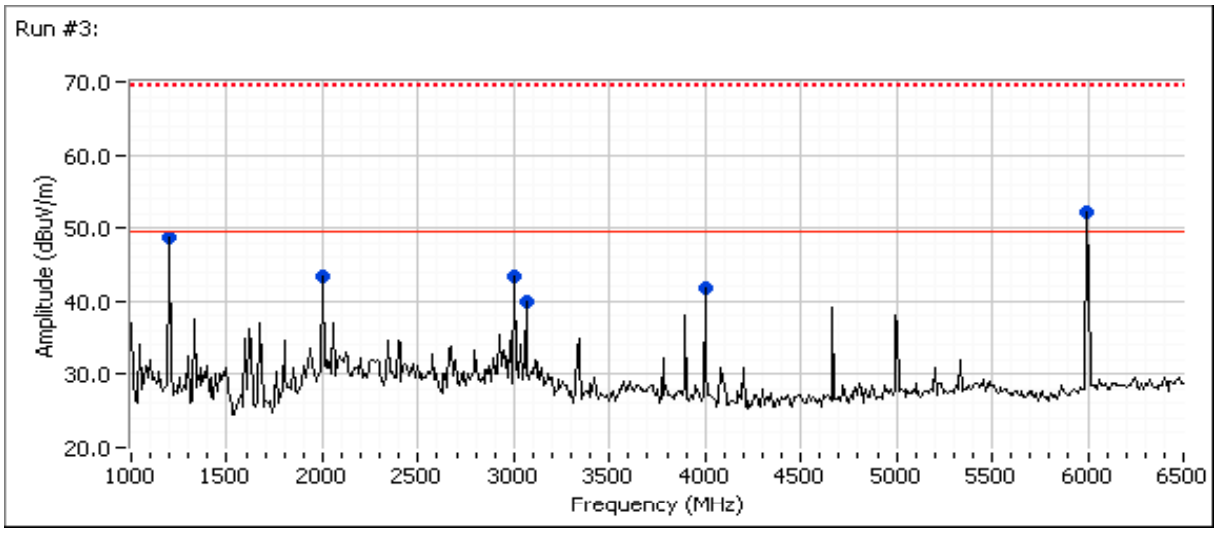
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	5	10	-6.0

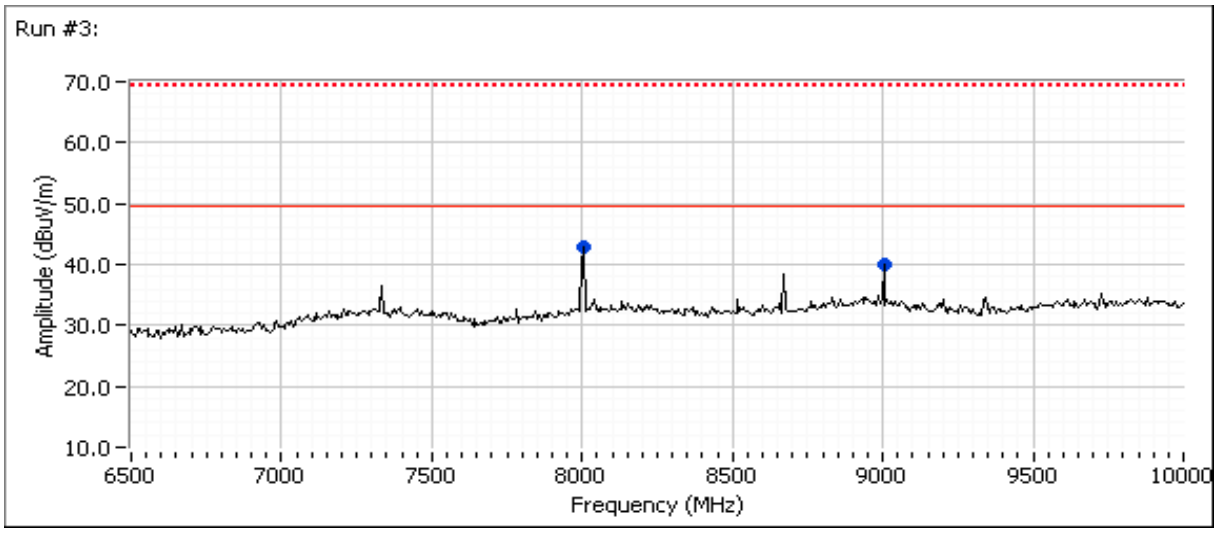
Frequency	Level	Pol	EN55022 A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
150.006	36.4	H	40.0	-3.6	QP	275	3.0	QP (1.00s)
1000.000	41.9	H	47.0	-5.1	QP	205	1.0	QP (1.00s)
750.006	37.9	V	47.0	-9.1	QP	196	1.0	QP (1.00s)
950.018	36.4	H	47.0	-10.6	QP	196	1.0	QP (1.00s)
900.005	34.0	V	47.0	-13.0	QP	160	1.5	QP (1.00s)
125.006	26.9	V	40.0	-13.1	QP	286	1.0	QP (1.00s)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #3: Maximized Readings, 1000 - 15000 MHz

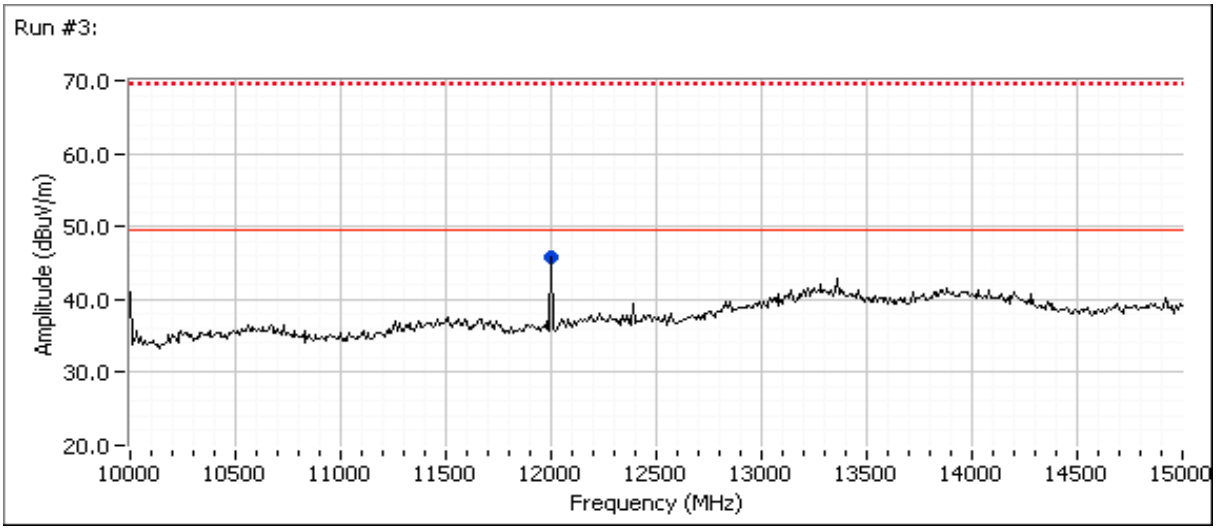
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	10	-10.5





Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #3: Maximized Readings, 1000 - 15000 MHz



Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	Pol	FCC A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.130	52.3	V	49.5	2.8	Peak	0	1.0	
1200.020	48.8	H	49.5	-0.7	Peak	261	1.3	
3000.070	43.4	V	49.5	-6.1	Peak	190	1.3	
1999.990	43.3	H	49.5	-6.2	Peak	205	1.0	
4000.150	41.7	V	49.5	-7.8	Peak	164	1.0	
3037.790	39.9	V	49.5	-9.6	Peak	24	1.3	
8000.170	43.0	V	49.5	-6.5	Peak	163	1.3	
9000.050	40.1	V	49.5	-9.4	Peak	352	1.3	
12000.330	45.8	H	49.5	-3.7	Peak	156	1.3	

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #3: Maximized Readings, 1000 - 15000 MHz

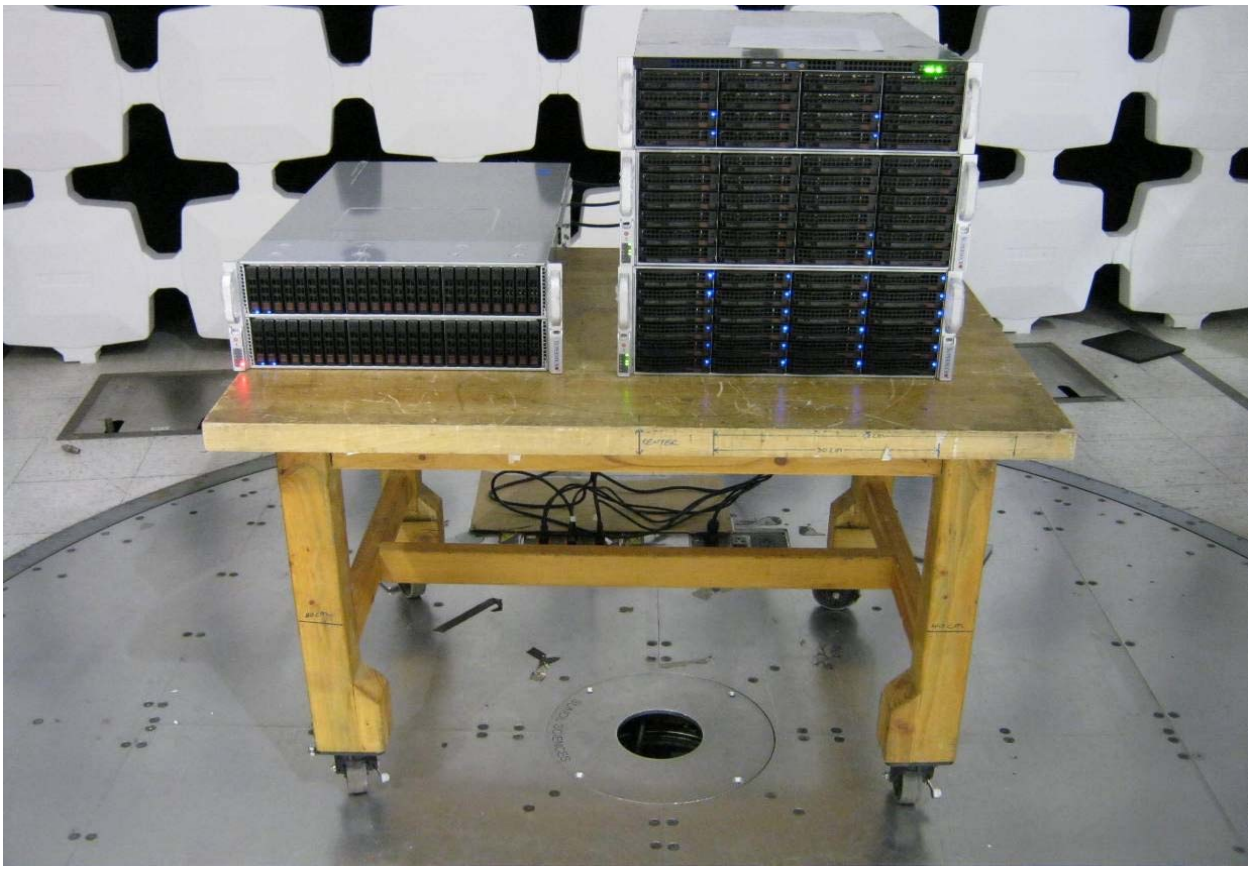
Final peak and average readings

Frequency	Level	Pol	FCC A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5999.970	47.2	V	49.5	-2.3	AVG	7	1.0	RB 1 MHz;VB 10 Hz;Pk
1999.970	40.1	H	49.5	-9.4	AVG	210	1.0	RB 1 MHz;VB 10 Hz;Pk
12000.050	39.9	H	49.5	-9.6	AVG	151	1.1	RB 1 MHz;VB 10 Hz;Pk
8000.000	38.4	V	49.5	-11.1	AVG	178	1.3	RB 1 MHz;VB 10 Hz;Pk
1199.900	37.8	H	49.5	-11.7	AVG	255	1.3	RB 1 MHz;VB 10 Hz;Pk
4000.010	37.5	V	49.5	-12.0	AVG	145	1.1	RB 1 MHz;VB 10 Hz;Pk
3000.060	37.1	V	49.5	-12.4	AVG	184	1.3	RB 1 MHz;VB 10 Hz;Pk
6000.170	55.6	V	69.5	-13.9	PK	7	1.0	RB 1 MHz;VB 3 MHz;Pk
9000.050	35.6	V	49.5	-13.9	AVG	360	1.3	RB 1 MHz;VB 10 Hz;Pk
1200.180	50.9	H	69.5	-18.6	PK	255	1.3	RB 1 MHz;VB 3 MHz;Pk
3038.000	29.5	V	49.5	-20.0	AVG	5	1.3	RB 1 MHz;VB 10 Hz;Pk
1999.880	48.4	H	69.5	-21.1	PK	210	1.0	RB 1 MHz;VB 3 MHz;Pk
12000.160	48.3	H	69.5	-21.2	PK	151	1.1	RB 1 MHz;VB 3 MHz;Pk
7999.770	45.8	V	69.5	-23.7	PK	178	1.3	RB 1 MHz;VB 3 MHz;Pk
3000.110	45.4	V	69.5	-24.1	PK	184	1.3	RB 1 MHz;VB 3 MHz;Pk
9000.090	44.5	V	69.5	-25.0	PK	360	1.3	RB 1 MHz;VB 3 MHz;Pk
4000.170	43.1	V	69.5	-26.4	PK	145	1.1	RB 1 MHz;VB 3 MHz;Pk
3037.490	38.1	V	69.5	-31.4	PK	5	1.3	RB 1 MHz;VB 3 MHz;Pk

Note 1:	Above 1 GHz, the limit is based on an average measurement. In addition, the peak reading of any emission above 1 GHz can not exceed the average limit by more than 20 dB.

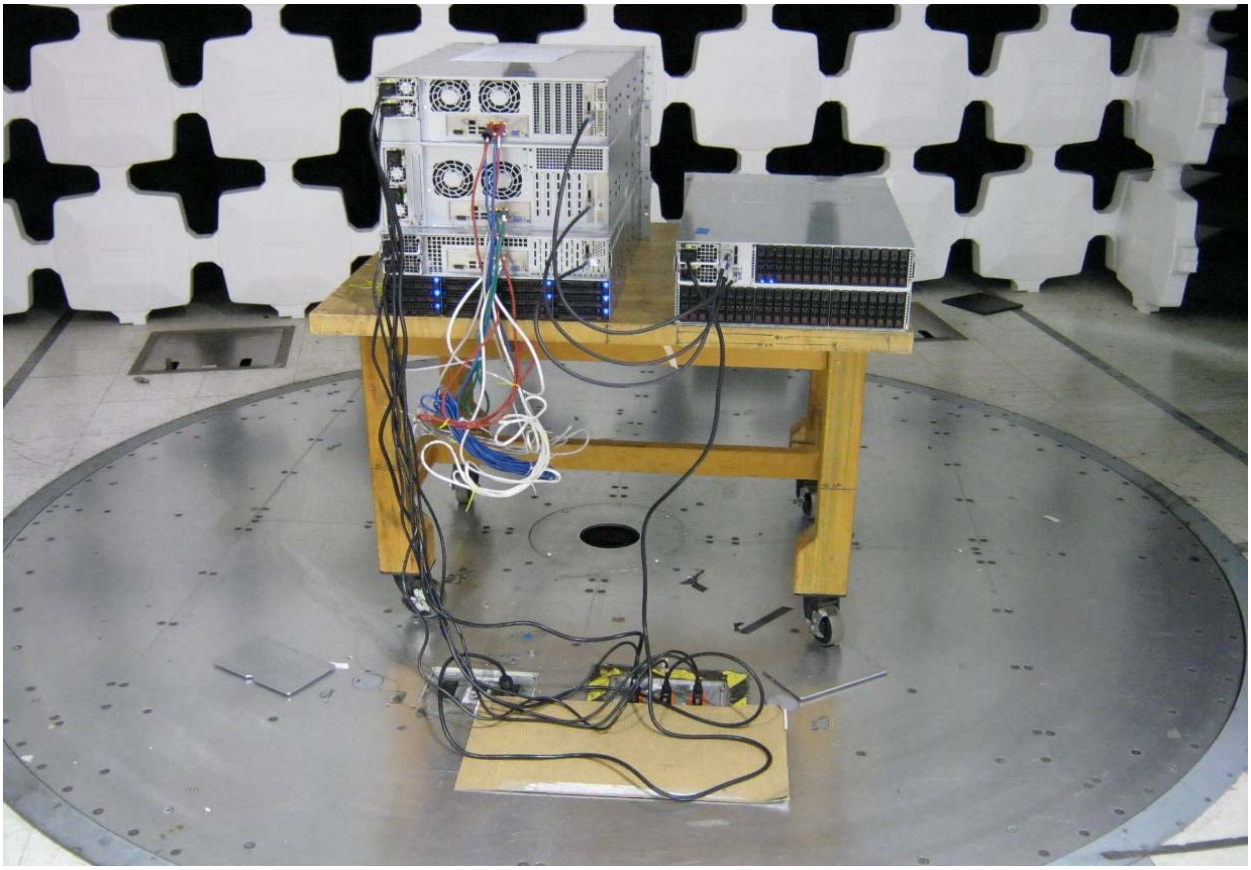
Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #1
(Radiated Emissions)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #2
(Radiated Emissions)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Radiated Emissions (Free-Space)

(Elliott Laboratories Fremont Facility, Chamber Configured for Free-Space Measurements)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/14/2012
Test Engineer: Chris Groat
Test Location: Fremont Chamber #4
Config. Used: 1
Config Change: none
EUT Voltage: 230V/50Hz

General Test Configuration

Anechoic material was placed on the floor between the EUT and the measurement antenna and behind the EUT to ensure that the test site complies with the requirements of CISPR 16 for measurements of radiated field strength above 1GHz in a free-space environment. The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.
The test was performed at a test distance of 3 meters.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 34 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Free Space Radiated Emissions 1 - 6 GHz, Preliminary	Class A	EVAL	Refer to individual runs
2	Free Space Radiated Emissions 1 - 6 GHz, Maximized	Class A	Pass	52.4 dBµV/m @ 1200.1 MHz (-3.6 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

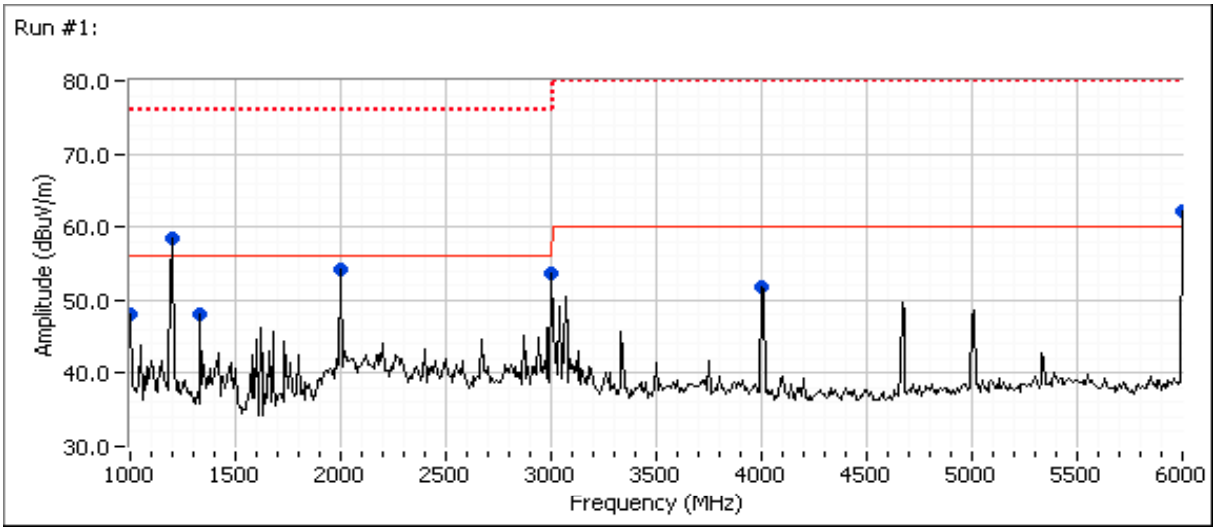
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #1: Preliminary Readings (1 - 6 GHz, EN 55022)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 6000 MHz	3	3	0.0



Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	Pol	Class A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.170	58.4	H	56.0	2.4	Peak	139	1.6	
6000.000	62.1	V	60.0	2.1	Peak	5	1.3	
2000.000	54.1	H	56.0	-1.9	Peak	204	1.3	
3000.080	53.7	V	56.0	-2.3	Peak	10	1.3	
1333.410	48.2	H	56.0	-7.8	Peak	224	1.9	
1000.040	48.0	H	56.0	-8.0	Peak	203	1.0	
4000.080	51.7	V	60.0	-8.3	Peak	161	1.0	

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Run #1: Preliminary Readings (1 - 6 GHz, EN 55022)

Peak and average readings (including maximization of turntable azimuth and antenna height)

Frequency	Level	Pol	Class A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.060	52.4	H	56.0	-3.6	AVG	143	1.6	RB 1 MHz;VB 10 Hz;Pk
5999.980	56.4	V	60.0	-3.6	AVG	4	1.3	RB 1 MHz;VB 10 Hz;Pk
2000.030	49.3	H	56.0	-6.7	AVG	204	1.3	RB 1 MHz;VB 10 Hz;Pk
2999.990	48.9	V	56.0	-7.1	AVG	7	1.3	RB 1 MHz;VB 10 Hz;Pk
1000.080	45.2	H	56.0	-10.8	AVG	203	1.0	RB 1 MHz;VB 10 Hz;Pk
3999.960	49.2	V	60.0	-10.8	AVG	159	1.1	RB 1 MHz;VB 10 Hz;Pk
1333.400	44.9	H	56.0	-11.1	AVG	218	1.9	RB 1 MHz;VB 10 Hz;Pk
1199.750	63.2	H	76.0	-12.8	PK	143	1.6	RB 1 MHz;VB 3 MHz;Pk
2999.830	56.9	V	76.0	-19.1	PK	7	1.3	RB 1 MHz;VB 3 MHz;Pk
2000.040	56.5	H	76.0	-19.5	PK	204	1.3	RB 1 MHz;VB 3 MHz;Pk
1000.080	55.9	H	76.0	-20.1	PK	203	1.0	RB 1 MHz;VB 3 MHz;Pk
5999.480	58.5	V	80.0	-21.5	PK	4	1.3	RB 1 MHz;VB 3 MHz;Pk
1333.470	51.1	H	76.0	-24.9	PK	218	1.9	RB 1 MHz;VB 3 MHz;Pk
4000.000	54.8	V	80.0	-25.2	PK	159	1.1	RB 1 MHz;VB 3 MHz;Pk

Run #2: Maximized Readings from Run #1 (1 - 6 GHz, EN 55022)

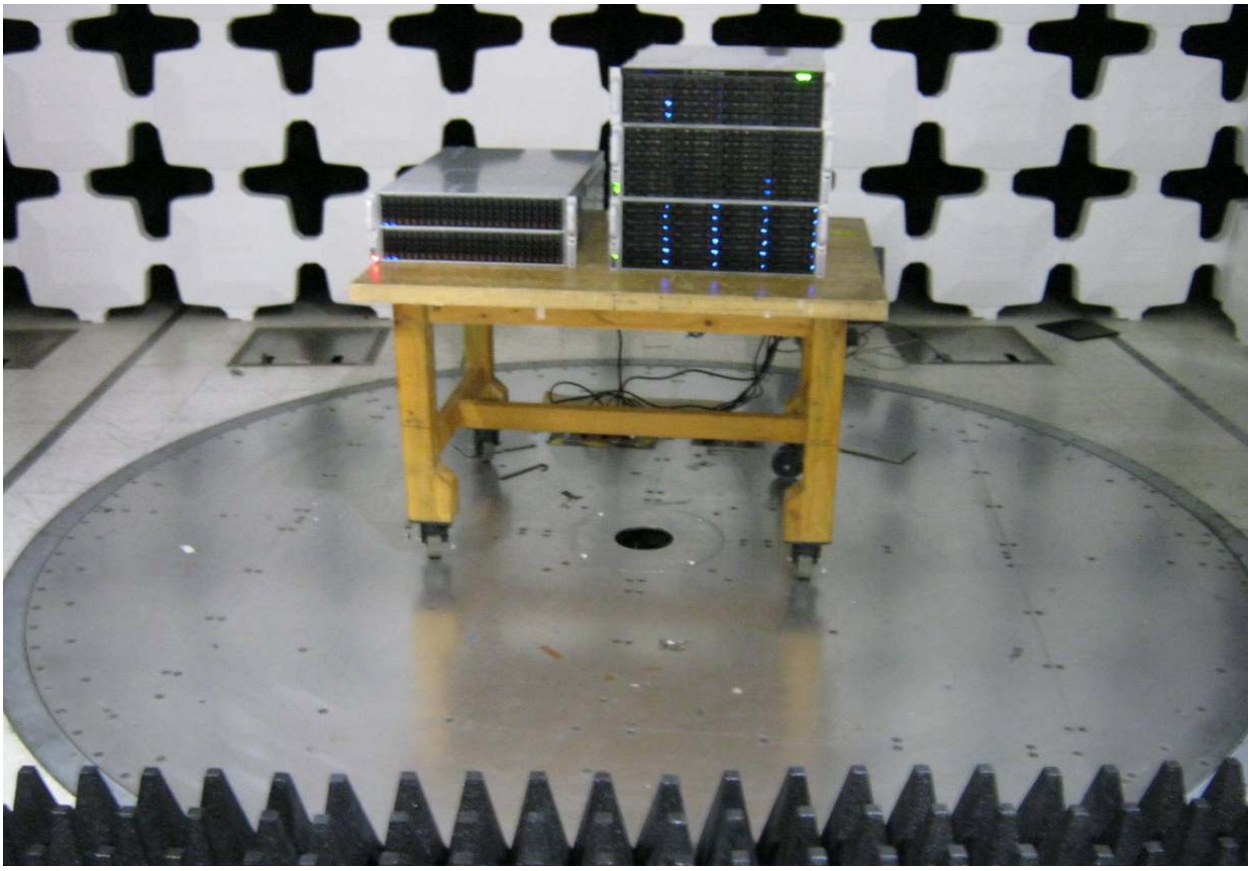
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 6000 MHz	3	3	0.0

Final Peak and average readings
(including maximization of turntable azimuth, antenna height, and manipulation of cable positions)

Frequency	Level	Pol	Class A		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.060	52.4	H	56.0	-3.6	AVG	143	1.6	RB 1 MHz;VB 10 Hz;Pk
5999.980	56.4	V	60.0	-3.6	AVG	4	1.3	RB 1 MHz;VB 10 Hz;Pk
2000.030	49.3	H	56.0	-6.7	AVG	204	1.3	RB 1 MHz;VB 10 Hz;Pk
2999.990	48.9	V	56.0	-7.1	AVG	7	1.3	RB 1 MHz;VB 10 Hz;Pk
1000.080	45.2	H	56.0	-10.8	AVG	203	1.0	RB 1 MHz;VB 10 Hz;Pk
3999.960	49.2	V	60.0	-10.8	AVG	159	1.1	RB 1 MHz;VB 10 Hz;Pk

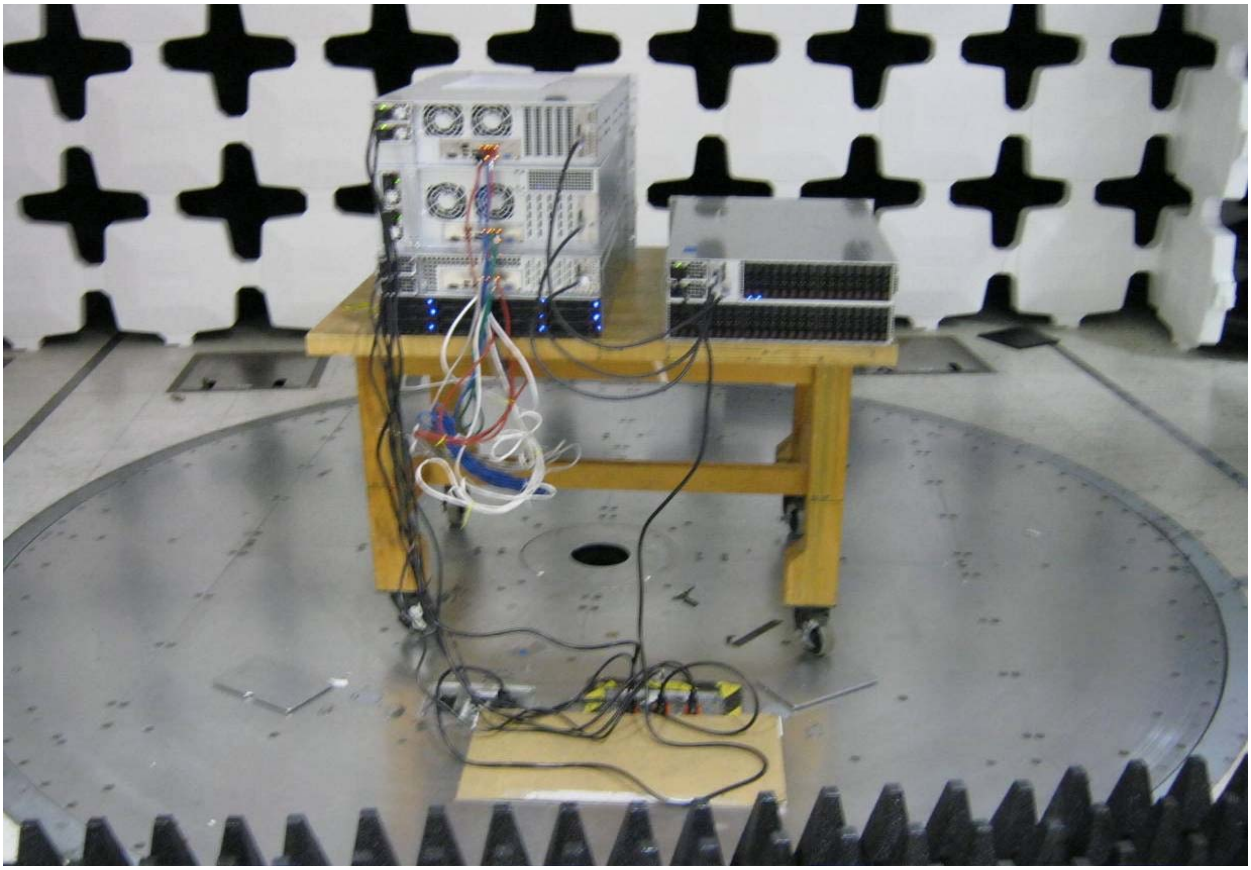
Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #1
(Radiated Emissions - Free Space)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Standard:	FCC Part15B, EN 55022, VCCI	Class:	A

Test Configuration Photograph #2
(Radiated Emissions - Free Space)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Electrostatic Discharge (EN 61000-4-2)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/17/2012 8:13 Config. Used: 2
Test Engineer: Chris Groat Config Change: none
Test Location: Fremont EMC Lab #3 EUT Voltage: 230V/50Hz

General Test Configuration

For tabletop equipment, the EUT and all local support equipment were located on a 0.5-mm thick insulating layer above a horizontal coupling plane, 80 cm above a ground reference plane. For floor-standing equipment, the EUT was located 10 cm above a ground reference plane.

Unless otherwise stated, ten discharges at each voltage, and polarity, were applied to each test point listed. Contact discharges (CD) were applied to coupling planes and conductive surfaces of the EUT. Air discharges (AD) were applied to any non-conductive surfaces of the EUT. The VCP was located on the tabletop for tabletop devices and 80cm above the ground plane for floor-standing equipment.

The determination as to the test point being a part of a conductive or non-conductive surface was based on the manufacturer's declaration.

Ambient Conditions:

Temperature: 21 °C
Relative Humidity: 34 %
Pressure: 1016 mb

Summary of Results - Electrostatic Discharges

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	Enclosure	4kV CD 8kV AD	4kV CD 8kV AD	B	A / Pass	Refer to Individual Run

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #1: Electrostatic Discharge
Doubled sided 4U

Indirect Discharges (To Coupling Planes)	Positive Polarity (kV)				Negative Polarity (kV)			
Contact Mode	Level 1 2	Level 2 4	Level 3 6	Level 4 8	Level 1 2	Level 2 4	Level 3 6	Level 4 8
Vertical Coupling Plane (VCP) located 10cm from the front, rear, left and right sides of the EUT	X	X			X	X		
Horizontal Coupling Plane (HCP) located 10cm from the front, rear, left and right sides of the EUT	X	X			X	X		

Direct Discharges (To the EUT)	Positive Polarity (kV)				Negative Polarity (kV)			
Contact Mode	Level 1 2	Level 2 4	Level 3 6	Level 4 8	Level 1 2	Level 2 4	Level 3 6	Level 4 8
Top Side(x20)	X	X			X	X		
Right Side(x10)	X	X			X	X		
Left Side(x10)	X	X			X	X		
Front Side(x10)	X	X			X	X		
Back Side(x10)	X	X			X	X		
Front Handles(x4)	X	X			X	X		
Serial(dB9) Port	X	X			X	X		
USB Port	X	X			X	X		
RJ45 Port	X	X			X	X		
VGA Port	X	X			X	X		
AC Power Inputs(x2)	X	X			X	X		
Ground Screws(Back)	X	X			X	X		

Air Discharge Mode	Level 1 2	Level 2 4	Level 3 8	Level 4 15	Level 1 2	Level 2 4	Level 3 8	Level 4 15
AC Power Inputs	N/A	N/A	N/A		N/A	N/A	N/A	
Disk Drives	N/A	N/A	N/A		N/A	N/A	N/A	
LED's Front	N/A	N/A	N/A		N/A	N/A	N/A	
Power Button	X	X	X		X	X	X	
Reset Button	X	X	X		X	X	X	

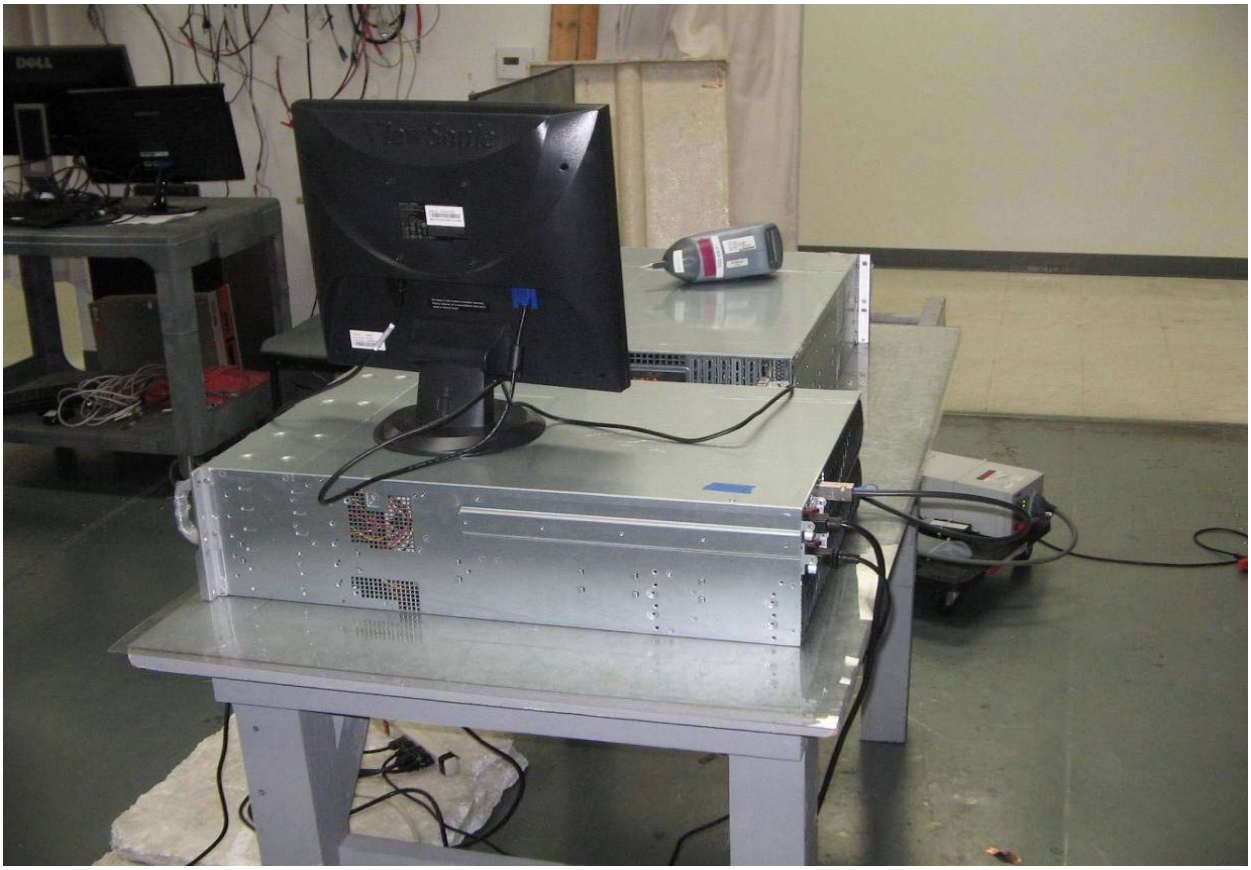
Note:	An "X" indicates that the unit continued to operate as intended. Normal operation is indicated by having the scrolling "H" pattern keep showing on the screen and shall be monitored by the Burn-In Diagnostic Software. There were no data errors reported by
Note:	ND: No discharge was possible due to the lack of a discharge path to ground from the test point. HCP: Horizontal Coupling Plane. VCP: Vertical Coupling Plane

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1
(Electrostatic Discharge, EN 61000-4-2)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #2
(Electrostatic Discharge, EN 61000-4-2)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Radiated Immunity (EN 61000-4-3)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/13/2012 13:32 Config. Used: 2
Test Engineer: Chris Groat Config Change: none
Test Location: Fremont Chamber #6 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were located on a turntable in an anechoic chamber. All remote support equipment was located outside the chamber. Interface cabling to the remote support equipment was routed along the floor and, where possible, passed through ferrite clamps at the exit point from the chamber.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 34 %

Summary of Results-Radiated Immunity

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
EN 55024 Requirements						
1	Enclosure	80-1000 MHz 1kHz 80% AM 3 V/m	80-1000 MHz 1kHz 80% AM 3 V/m	A	A / Pass	Refer to Individual Run

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #1: Radiated Immunity, 80-1000 MHz (EN61000-4-3)

Frequency:	80-1000 MHz
Step Size:	1 %
Dwell time:	2874 ms
Field Uniformity:	1.5m x 1.5m
Test Distance:	2 meters

Modulation Details	
Modulating Frequency:	1 kHz
Modulation:	AM
Depth / Deviation:	80%

Frequency	Level	Front		Left Side		Rear		Right		Top		Bottom	
Range (MHz)	V/m	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.
80-1000	3	X	X	X	X	X	X	X	X	N/A	N/A	N/A	N/A
EN 55024 Select Frequencies (Note 1)	3	X	X	X	X	X	X	X	X	N/A	N/A	N/A	N/A

Test files used for this run:
The following calibration files from U:\EMC Stuff\RI Playback Files FT\CH6\Current\80-1000 MHz (April 2010)\03 Vm\ were used:
Position A 1.55m 80 MHz - 1000 MHz H 3Vm.crf
Position A 1.55m 80 MHz - 1000 MHz V 3Vm.crf

Note:	An "X" indicates that the unit continued to operate as intended. Normal operation is indicated by having the scrolling "H" pattern keep showing on the screen and shall be monitored by the Burn-In Diagnostic Software. There were no data errors reported by the monitoring software.
Note 1:	As the EUT was telecommunications terminal equipment, functional checks of the system were made at the selected frequencies detailed in EN 55024 in accordance with Annex A of the standard. The selected frequencies are 80, 120, 160, 230, 434, 460, 600, 863 and 900 MHz.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1
(Radiated Immunity, EN 61000-4-3)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Electrical Fast Transient/Burst (EFT/B) (EN 61000-4-4)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/16/2012 19:20 Config. Used: 2
Test Engineer: Vishal Narayan Config Change: None
Test Location: Fremont EMC Lab #1 EUT Voltage: 230V/50Hz

General Test Configuration (EN 61000-4-4)

The EUT system was located 10 cm above a ground reference plane. A 0.5 m long power cord was used between the EUT's power port and the coupling/decoupling network. Interference was coupled onto the cables connected to the ports identified in the test data tables using the capacitive trench, with a maximum length of 0.5m of cable between the interface port and the trench.

Ambient Conditions:

Temperature: 22 °C
Rel. Humidity: 32 %

Summary of Results

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	AC Power	± 1 kV	± 1 kV	B	A / Pass	
1	Signal	± 0.5 kV	± 0.5 kV	B	A / Pass	
2	AC Power	± 1 kV	± 1 kV	B	A / Pass	

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #1: EFT/B Testing

Test Method: EN 61000-4-4

Double sided 4U

Test Parameters	
Waveform: 5 ns / 50 ns	Burst Period: 300 ms
Repetition Frequency: 5 kHz (2.5 kHz @ 4 kV)	Burst Width: 15 ms

Applied Location	Positive Polarity (kV)				Negative Polarity (kV)			
Power Line AC Power Port(s)	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0
Line + Neutral + Protective Earth *(3-Wire AC Power Port)*	Note 1	Note 1			Note 1	Note 1		
I/O Port	Level 1 0.25	Level 2 0.5	Level 3 1.0	Level 4 2.0	Level 1 0.25	Level 2 0.5	Level 3 1.0	Level 4 2.0
Ethernet	Note 1	Note 1			Note 1	Note 1		

Note:	An "X" indicates that the unit continued to operate as intended. The EUT continued to operate as outlined in test configuration #2 under the heading "EUT operation during immunity tests. No errors were observed.
Note:	The interface cables for the I/O ports tested were routed through the capacitive trench and tested simultaneously.
Note 1:	The Keyboard and mouse stopped responding. The keyboard and mouse are not to be evaluated per performance criteria and therefore the EUT passes this test by performance criteria A.

The following interface ports were not tested:

Port(s)	Reason
USB, VGA and SATA	The ports are intended to connect to cables less than 3m in length and the product standard only requires the test to be performed on cables exceeding 3m in length.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #2: EFT/B Testing

Test Method: EN 61000-4-4

Single sided 4U

Test Parameters	
Waveform: 5 ns / 50 ns	Burst Period: 300 ms
Repetition Frequency: 5 kHz (2.5 kHz @ 4 kV)	Burst Width: 15 ms

Applied Location	Positive Polarity (kV)				Negative Polarity (kV)			
Power Line AC Power Port(s)	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0
Line + Neutral + Protective Earth *(3-Wire AC Power Port)*	X	X			X	X		

Note:	An "X" indicates that the unit continued to operate as intended. The EUT continued to operate as outlined in test configuration #2 under the heading "EUT operation during immunity tests. No errors were observed.

The following interface ports were not tested:

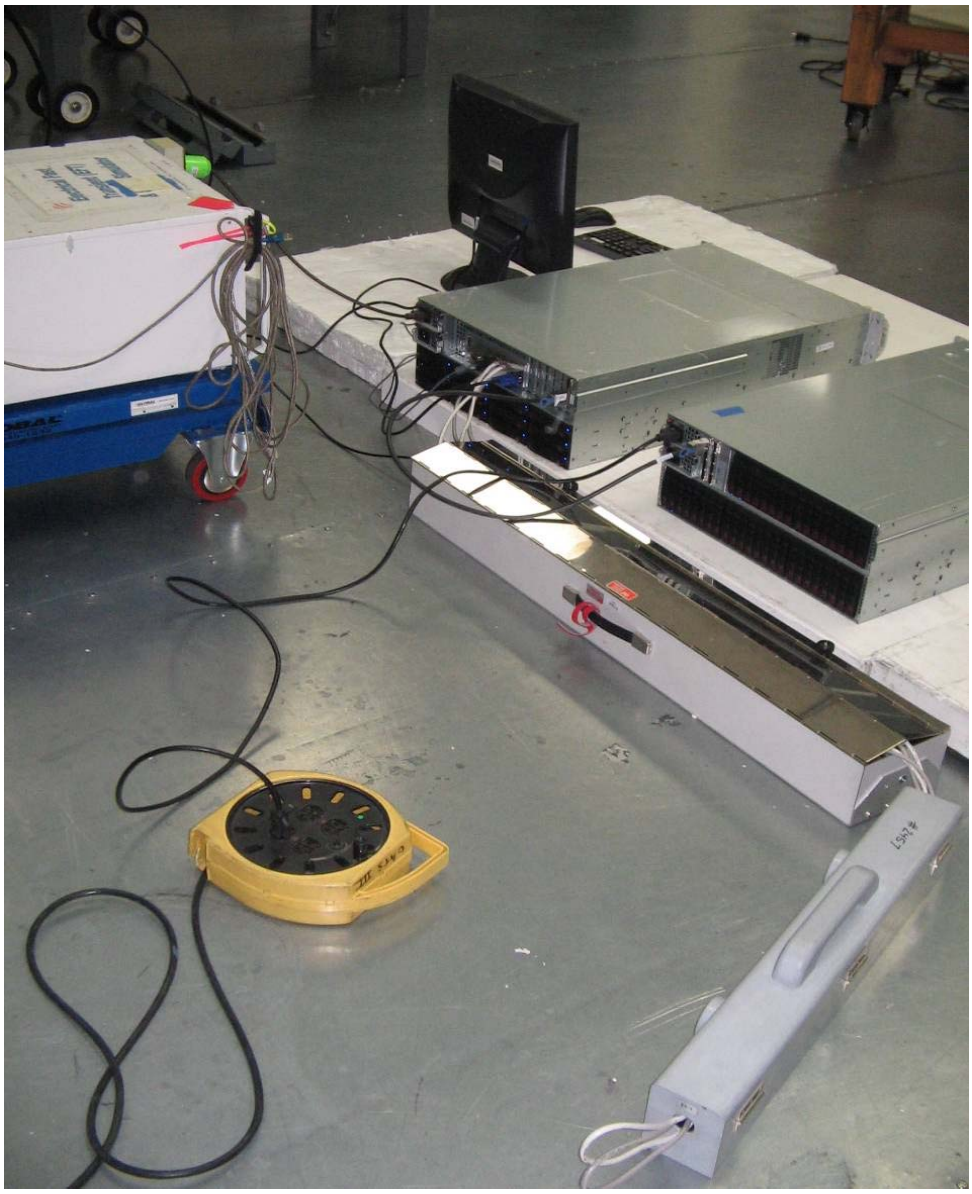
Port(s)	Reason
USB, VGA and SATA	The ports are intended to connect to cables less than 3m in length and the product standard only requires the test to be performed on cables exceeding 3m in length.
Ethernet	Did not test per JT notes.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1
(Electrical Fast Transient/Burst, EN 61000-4-4) Double sided 4U

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #2
(Electrical Fast Transient/Burst, EN 61000-4-4) Double sided 4U

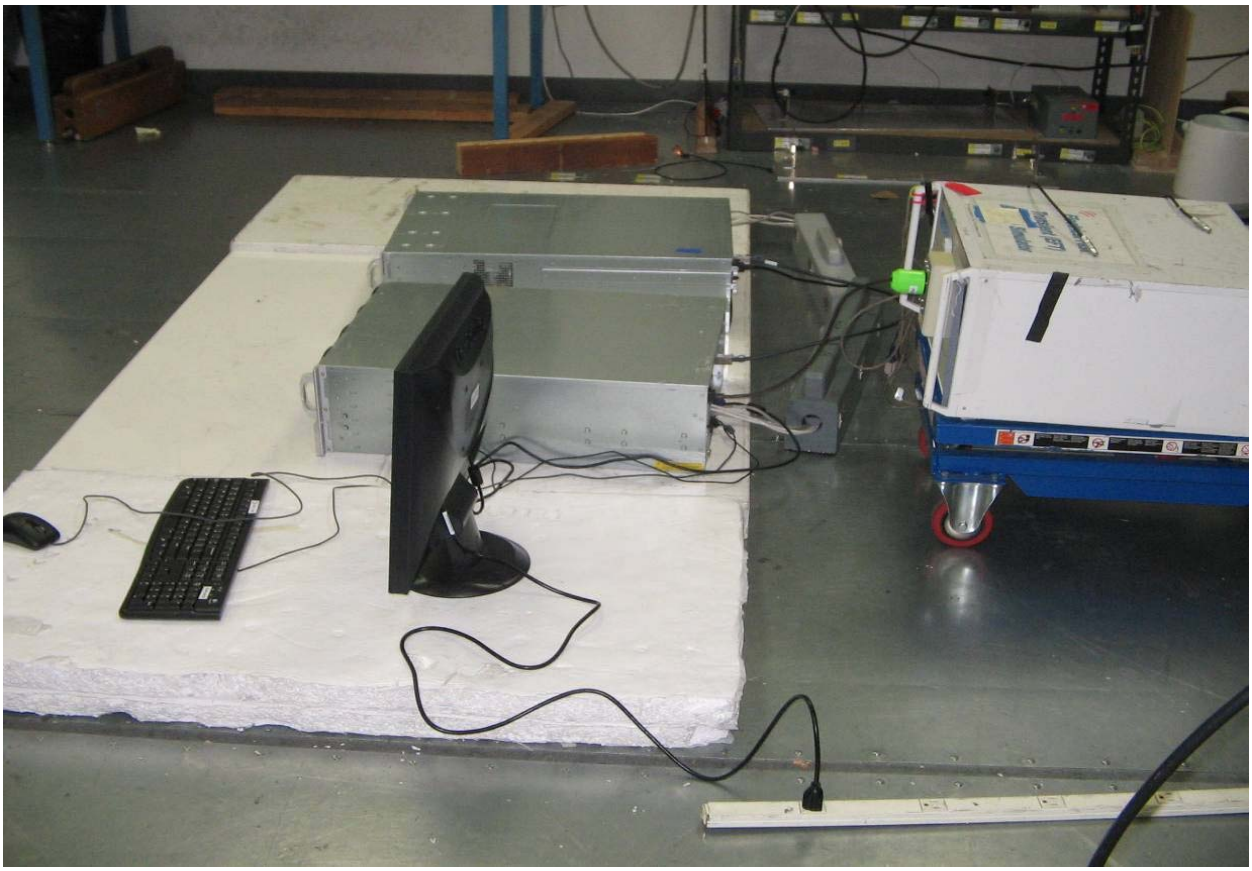


Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1
(Electrical Fast Transient/Burst, EN 61000-4-4) Single sided 4U

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #2
(Electrical Fast Transient/Burst, EN 61000-4-4) Single sided 4U



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Surge (EN 61000-4-5)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/17/2012 21:31 Config. Used: 1
Test Engineer: Peter Sales Config Change: None
Vishal Narayan
Test Location: Fremont EMC Lab #2 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were located on a non-conductive bench.

Ambient Conditions:

Temperature: 24 °C
Rel. Humidity: 33 %

Summary of Results

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	AC Power	± 2 kV CM ± 1 kV DM	± 2 kV CM ± 1 kV DM	B	A / Pass	Single sided 4U
2	AC Power	± 2 kV CM ± 1 kV DM	± 2 kV CM ± 1 kV DM	B	A / Pass	Double sided 4U

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #1: Surge Immunity, Power Line
AC Power Port
Single sided 4U

Test Parameters
Waveform: 1.2/50µS
Impedance: 12 Ohms (Common Mode), 2 Ohms (Differential Mode)

Applied Location	Positive Polarity (kV)				Negative Polarity (kV)			
Power Line	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0
Line to Line (Differential Mode)								
0°	X	X			X	X		
90°	X	X			X	X		
180°	X	X			X	X		
270°	X	X			X	X		
Line to PE (Common Mode)								
0°	X	X	X		X	X	X	
90°	X	X	X		X	X	X	
180°	X	X	X		X	X	X	
270°	X	X	X		X	X	X	
Neutral to PE (Common Mode)								
0°	X	X	X		X	X	X	
90°	X	X	X		X	X	X	
180°	X	X	X		X	X	X	
270°	X	X	X		X	X	X	

Note: An "X" indicates that the unit continued to operate as intended. The EUT continued to operate as outlined in test configuration #2 under the heading "EUT operation during immunity tests. No errors were observed.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #2: Surge Immunity, Power Line
AC Power Port
Double sided 4U

Test Parameters
Waveform: 1.2/50µS
Impedance: 12 Ohms (Common Mode), 2 Ohms (Differential Mode)

Applied Location	Positive Polarity (kV)				Negative Polarity (kV)			
Power Line	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0
Line to Line (Differential Mode)								
0°	X	X			X	X		
90°	X	X			X	X		
180°	X	X			X	X		
270°	X	X			X	X		
Line to PE (Common Mode)								
0°	X	X	X		X	X	X	
90°	X	X	X		X	X	X	
180°	X	X	X		X	X	X	
270°	X	X	X		X	X	X	
Neutral to PE (Common Mode)								
0°	X	X	X		X	X	X	
90°	X	X	X		X	X	X	
180°	X	X	X		X	X	X	
270°	X	X	X		X	X	X	

Note: An "X" indicates that the unit continued to operate as intended. The EUT continued to operate as outlined in test configuration #2 under the heading "EUT operation during immunity tests. No errors were observed.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1
(Surge, EN 61000-4-5)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #2
(Surge, EN 61000-4-5)

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Conducted Immunity (EN 61000-4-6)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/16/2012 19:20 Config. Used: 2
Test Engineer: Vishal Narayan Config Change: None
Test Location: Fremont EMC Lab #1 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were placed on an insulating support 10 cm above a ground reference plane. All interface cables between parts of the EUT (for equipment comprising several units) and to local support equipment were also placed on the insulating support. All interface cabling between the EUT and the coupling and decoupling network(s) were located 3 to 5 cm above the ground reference plane.

Ambient Conditions:

Temperature: 23 °C
Rel. Humidity: 32 %

Summary of Results - Conducted Immunity

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	AC power	0.15-80MHz 1kHz 80% AM 3 Vrms	0.15-80MHz 1kHz 80% AM 3 Vrms	A	A / Pass	
1	Signal	0.15-80MHz 1kHz 80% AM 3 Vrms	0.15-80MHz 1kHz 80% AM 3 Vrms	A	A / Pass	
2	AC power	0.15-80MHz 1kHz 80% AM 3 Vrms	0.15-80MHz 1kHz 80% AM 3 Vrms	A	A / Pass	

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #1: Conducted Susceptibility (EN61000-4-6)
Double sided 4U

Test Level:	3 Vrms
Step Size:	1 %
Dwell time:	2874 ms

Modulation Details	
Modulating Frequency:	1 kHz
Modulation:	AM
Depth / Deviation:	80%

Frequency Range MHz	Port Under Test	Injection Method	Comments
0.15 - 80	AC Power	M3	Note 1
0.15 - 80	Ethernet	Clamp	Note 1

Note :	As the EUT was telecommunications terminal equipment, functional checks of the system were made at the spot frequencies detailed in EN 55024 in accordance with Annex A of the standard.
Note 1:	The EUT continued to operate as outlined in test configuration #2 under the heading "EUT operation during immunity tests. No errors were observed.

The following interface ports were not tested:

Port(s)	Reason
USB, VGA and SATA	The ports are intended to connect to cables less than 3m in length and the product standard only requires the test to be performed on cables exceeding 3m in length.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #2: Conducted Susceptibility (EN61000-4-6)
Single sided 4U

Test Level:	3 Vrms
Step Size:	1 %
Dwell time:	2874 ms

Modulation Details	
Modulating Frequency:	1 kHz
Modulation:	AM
Depth / Deviation:	80%

Frequency Range MHz	Port Under Test	Injection Method	Comments
0.15 - 80	AC Power	M3	Note 1

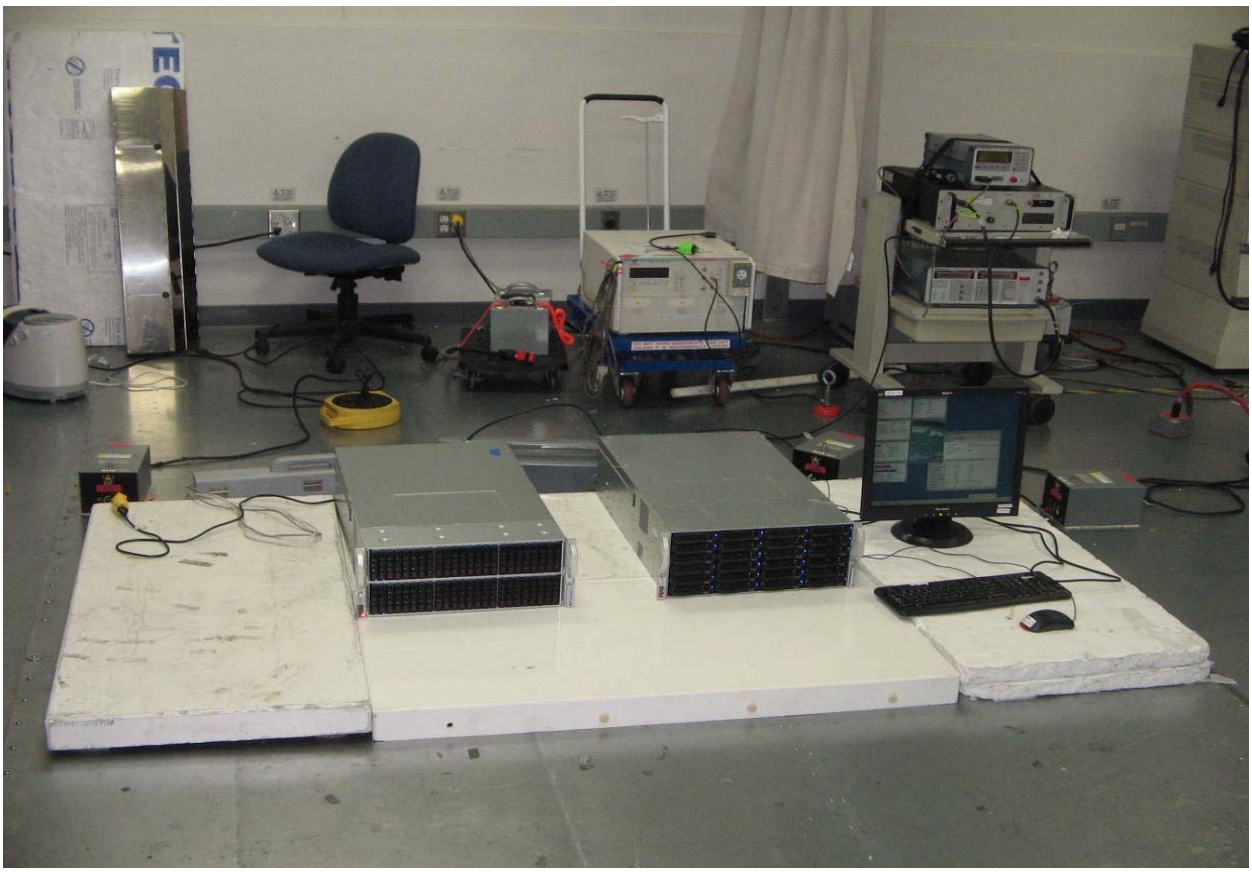
Note :	As the EUT was telecommunications terminal equipment, functional checks of the system were made at the spot frequencies detailed in EN 55024 in accordance with Annex A of the standard.
Note 1:	The EUT continued to operate as outlined in test configuration #2 under the heading "EUT operation during immunity tests. No errors were observed.

The following interface ports were not tested:

Port(s)	Reason
USB, VGA and SATA	The ports are intended to connect to cables less than 3m in length and the product standard only requires the test to be performed on cables exceeding 3m in length.
Ethernet	Did not test per JT notes.

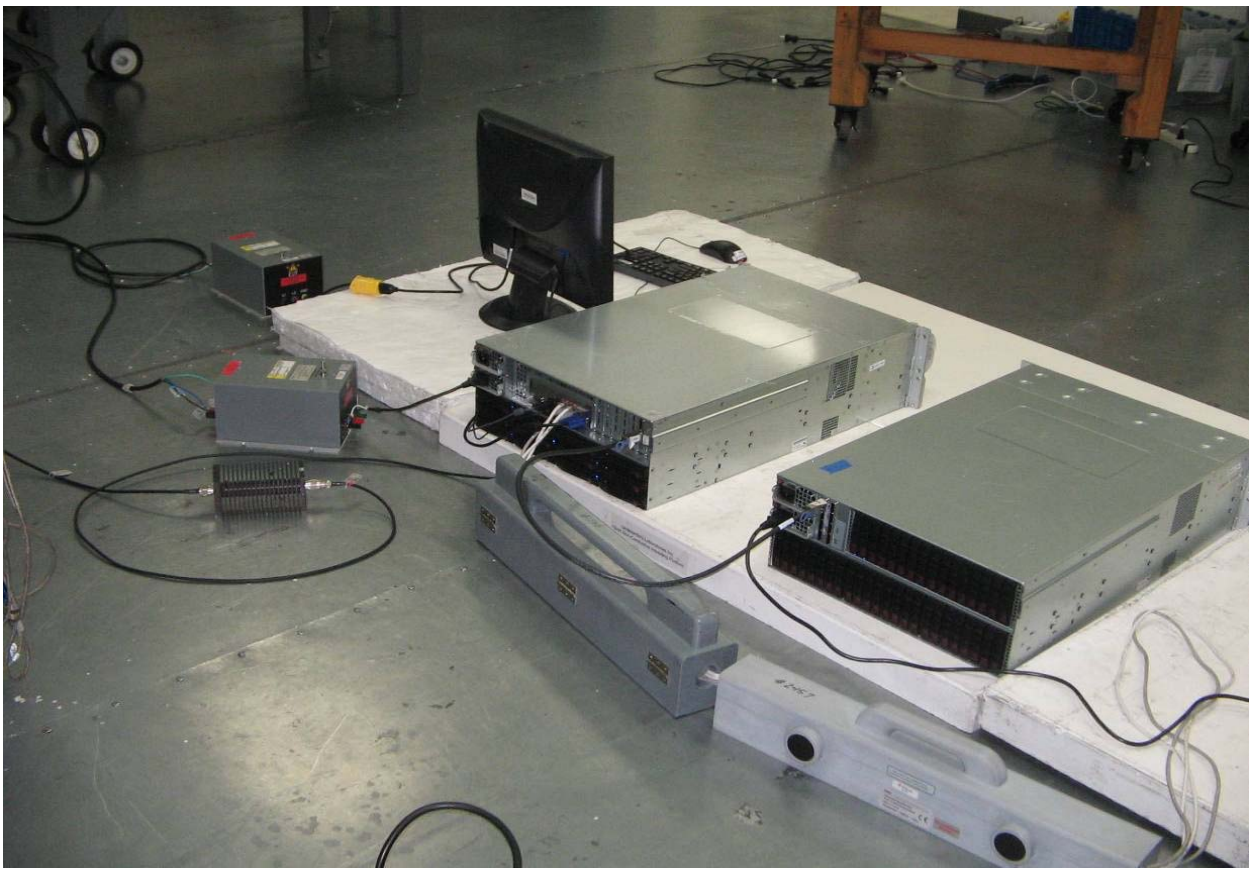
Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1
(Conducted Immunity, EN 61000-4-6) Double sided 4U



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #2
(Conducted Immunity, EN 61000-4-6) Double sided 4U

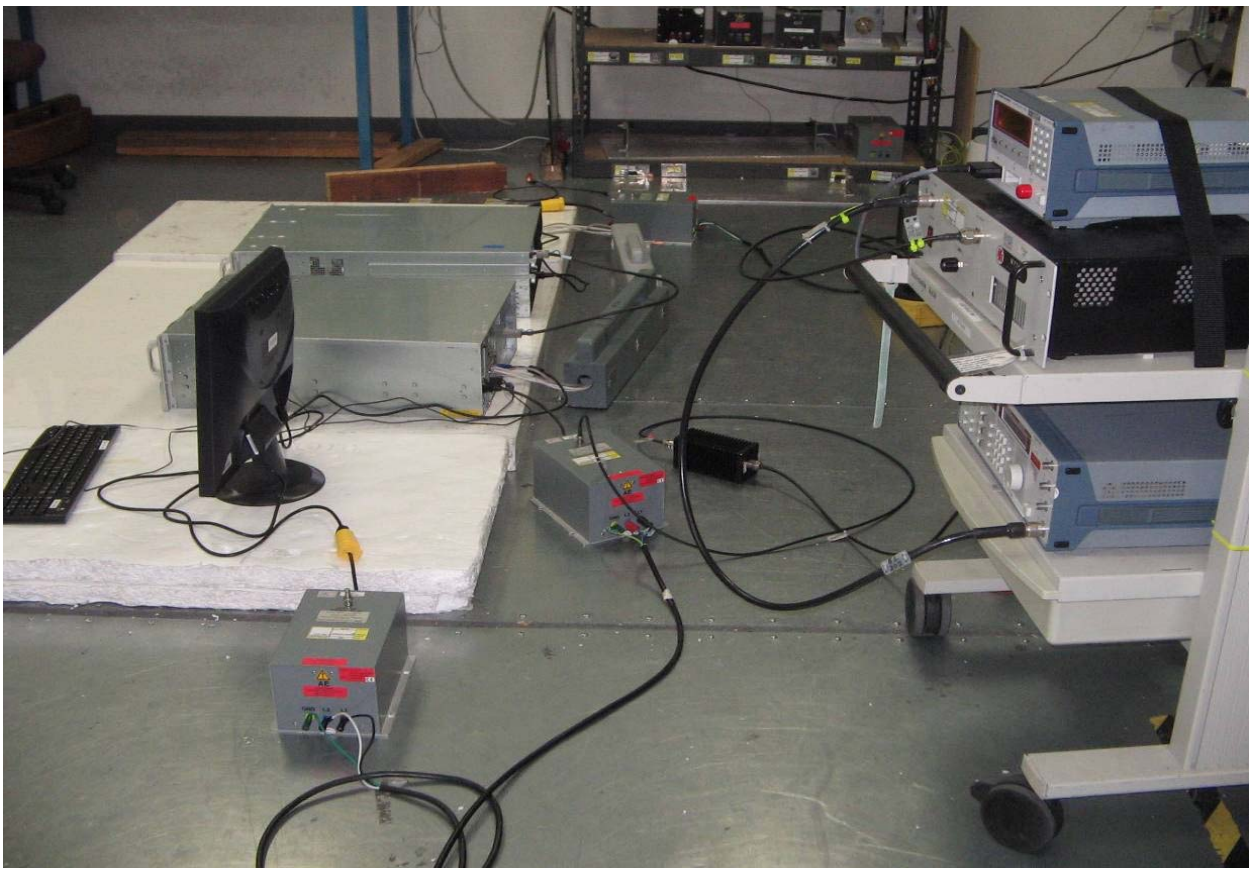


Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1
(Conducted Immunity, EN 61000-4-6) Single sided 4U

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #2
(Conducted Immunity, EN 61000-4-6) Single sided 4U



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Voltage Dips and Interrupts (EN 61000-4-11)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 4/16/2012 15:50
Test Engineer: Luis Cabrera
Test Location: Fremont EMC Lab #3
Config. Used: #2
Config Change: None
EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were located on a non-conductive bench.

Ambient Conditions:

Temperature: 22 °C
Rel. Humidity: 33 %

Summary of Results

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
EN 55024						
1	AC power	>95% ½ period	>95% ½ period	B	A / Pass	Tested on the double sided unit #3
2	AC power			B	A / Pass	Tested on the single sided unit #4
1	AC power	30% 25 periods	30% 25 periods	C	A / Pass	Tested on the double sided unit #3
2	AC power			C	A / Pass	Tested on the single sided unit #4
1	AC power	>95% 250 periods	>95% 250 periods	C	C / Pass	Tested on the double sided unit #3
2	AC power			C	C / Pass	Tested on the single sided unit #4

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Run #1: Voltage Dips and Interrupts Tested on the double sided unit #3

Nominal Operating Voltage of EUT:	230 Volts	50 Hz

Voltage Dips/Time % / ms or % / periods	Port Under Test	Interrupt Voltage	Comments
>95% ½ period	AC Power	0	Note 1
30% 25 periods	AC Power	161	Note 1
>95% 250 periods	AC Power	0	Note 2

Run #2: Voltage Dips and Interrupts Tested on the single sided unit #4

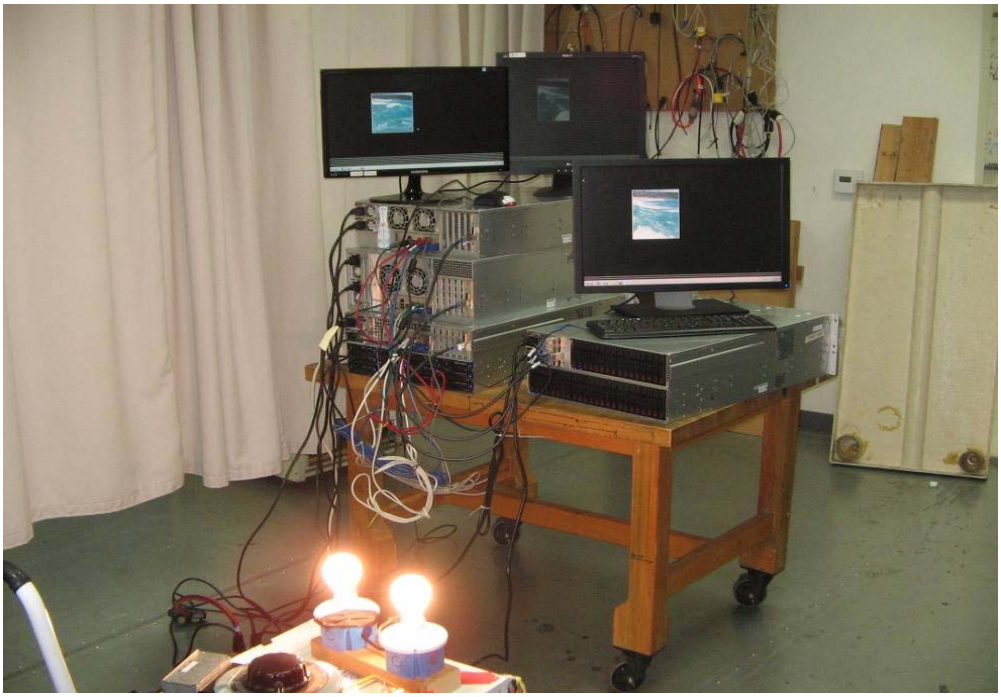
Nominal Operating Voltage of EUT:	230 Volts	50 Hz

Voltage Dips/Time % / ms or % / periods	Port Under Test	Interrupt Voltage	Comments
>95% ½ period	AC Power	0	Note 1
30% 25 periods	AC Power	161	Note 1
>95% 250 periods	AC Power	0	Note 2

Notes	
Note 1:	The EUT continued to operate as outlined in test configuration #2 under the heading "EUT operation during immunity tests. No errors were observed.
Note 2:	During the test, the EUT turned off. After the test, operator intervention was required to boot up the EUT normally

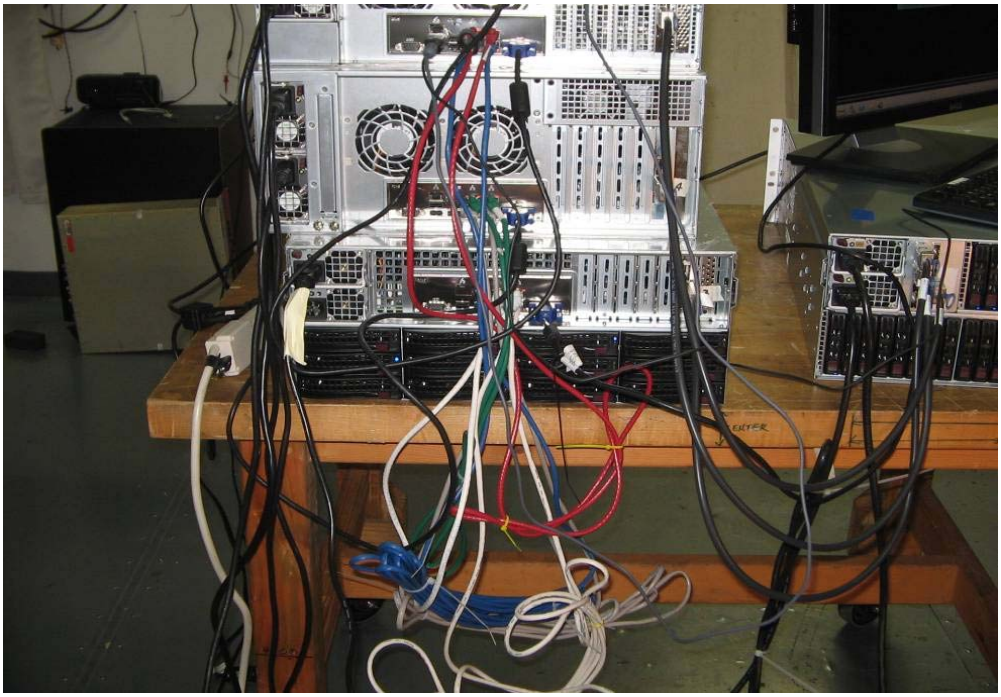
Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #1 Setup
(Voltage Dips and Interrupts, EN 61000-4-11)



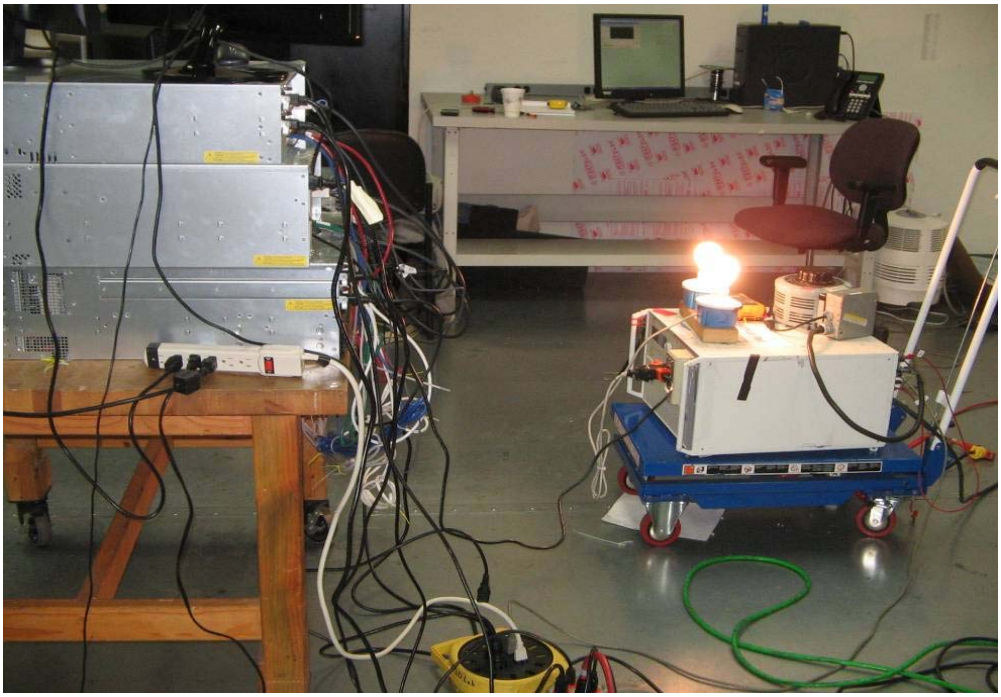
Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #2, Run#1
(Voltage Dips and Interrupts, EN 61000-4-11)



Client:	Supermicro Computer, Inc.	Job Number:	J87050
Model:	Super Storage Server (SSG-6037R-E1R16N, SSG-6047R-E1R24N, SSG-6047R-E1R36N)	T-Log Number:	T87058
		Account Manager:	Chandra Morris
Contact:	Victor Yuan		
Immunity Standard(s):	EN 55024	Environment:	Cover sheet

Test Configuration Photograph #3, Run#2
(Voltage Dips and Interrupts, EN 61000-4-11)



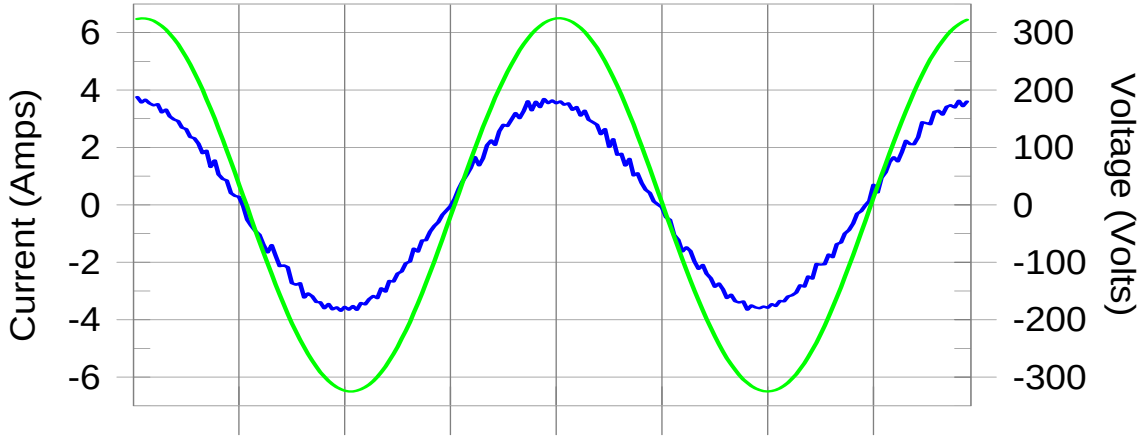
Appendix C Current Harmonics Test Data (EN 61000-3-2)

Harmonics
(per EN 61000-3-2:2006 + A1:2009 + A2:2009)
– Class-A per Ed. 3.2 (2009)(Run time) incl. inter-harmonics

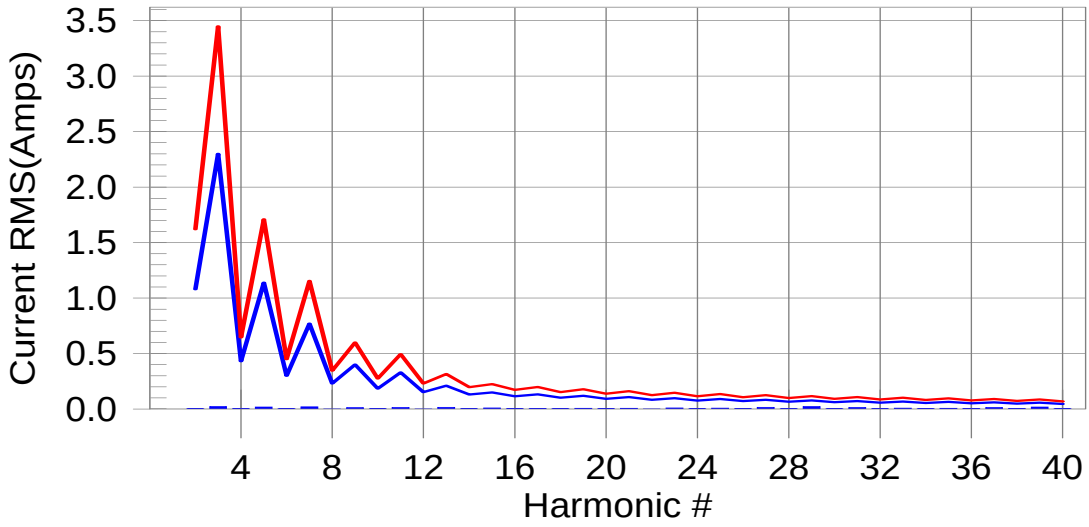
EUT: Super Storage Server (P/S: PWS-1K28P-SQ) **Tested by: Alika Hirano**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 1:11:14 PM** **End time: 1:12:35 PM**
Test duration (min): 1 **Data file name: H-000383.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonic was #39 with 30.00% of the limit.

Current Test Result Summary (Run time)

EUT: Cascaded Storage Server (P/S: PWS-1K28P-SQ) **Tested by: Alika Hirano**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 1:11:14 PM** **End time: 1:12:35 PM**
Test duration (min): 1 **Data file name: H-000383.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Source qualification: Normal**
THC(A): 0.05 **I-THD(%): 1.99** **POHC(A): 0.032** **POHC Limit(A): 0.304**
Highest parameter values during test:

V_RMS (Volts):	**229.95**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**3.769**	**I_RMS (Amps):**	**2.487**
I_Fund (Amps):	**2.467**	**Crest Factor:**	**1.524**
Power (Watts):	**563.9**	**Power Factor:**	**0.993**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	0.0	0.002	1.620	0.15	Pass
3	0.023	2.300	1.0	0.023	3.450	0.67	Pass
4	0.002	0.430	0.0	0.002	0.645	0.34	Pass
5	0.017	1.140	1.5	0.018	1.710	1.05	Pass
6	0.002	0.300	0.0	0.002	0.450	0.50	Pass
7	0.018	0.770	2.4	0.019	1.155	1.62	Pass
8	0.002	0.230	0.0	0.002	0.345	0.55	Pass
9	0.013	0.400	0.0	0.013	0.600	2.21	Pass
10	0.002	0.184	0.0	0.002	0.276	0.82	Pass
11	0.014	0.330	0.0	0.014	0.495	2.92	Pass
12	0.002	0.153	0.0	0.002	0.230	0.89	Pass
13	0.016	0.210	7.5	0.016	0.315	5.09	Pass
14	0.002	0.131	0.0	0.002	0.197	1.22	Pass
15	0.009	0.150	0.0	0.010	0.225	4.40	Pass
16	0.002	0.115	0.0	0.002	0.173	1.42	Pass
17	0.004	0.132	0.0	0.005	0.199	2.40	Pass
18	0.002	0.102	0.0	0.002	0.153	1.61	Pass
19	0.006	0.118	0.0	0.006	0.178	3.53	Pass
20	0.002	0.092	0.0	0.002	0.138	1.70	Pass
21	0.007	0.107	0.0	0.007	0.161	4.37	Pass
22	0.002	0.084	0.0	0.002	0.125	1.64	Pass
23	0.010	0.098	0.0	0.010	0.147	6.93	Pass
24	0.002	0.077	0.0	0.002	0.115	1.81	Pass
25	0.008	0.090	0.0	0.008	0.135	6.06	Pass
26	0.002	0.071	0.0	0.002	0.106	2.09	Pass
27	0.015	0.083	17.9	0.016	0.125	12.44	Pass
28	0.002	0.066	0.0	0.003	0.099	2.67	Pass
29	0.022	0.078	28.0	0.022	0.116	19.32	Pass
30	0.002	0.061	0.0	0.002	0.092	2.63	Pass
31	0.013	0.073	0.0	0.014	0.109	12.42	Pass
32	0.003	0.058	0.0	0.003	0.086	3.62	Pass
33	0.007	0.068	0.0	0.008	0.102	7.79	Pass
34	0.002	0.054	0.0	0.003	0.081	3.55	Pass
35	0.006	0.064	0.0	0.007	0.096	6.83	Pass
36	0.003	0.051	0.0	0.003	0.077	4.15	Pass
37	0.014	0.061	0.0	0.014	0.091	15.47	Pass
38	0.003	0.048	0.0	0.004	0.073	5.78	Pass
39	0.017	0.058	30.0	0.018	0.087	20.36	Pass
40	0.002	0.046	0.0	0.003	0.069	3.84	Pass

Voltage Source Verification Data (Run time)

EUT: Cascaded Storage Server (P/S: PWS-1K28P-SQ) **Tested by: Alika Hirano**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 1:11:14 PM** **End time: 1:12:35 PM**
Test duration (min): 1 **Data file name: H-000383.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	**229.95**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**3.769**	**I_RMS (Amps):**	**2.487**
I_Fund (Amps):	**2.467**	**Crest Factor:**	**1.524**
Power (Watts):	**563.9**	**Power Factor:**	**0.993**

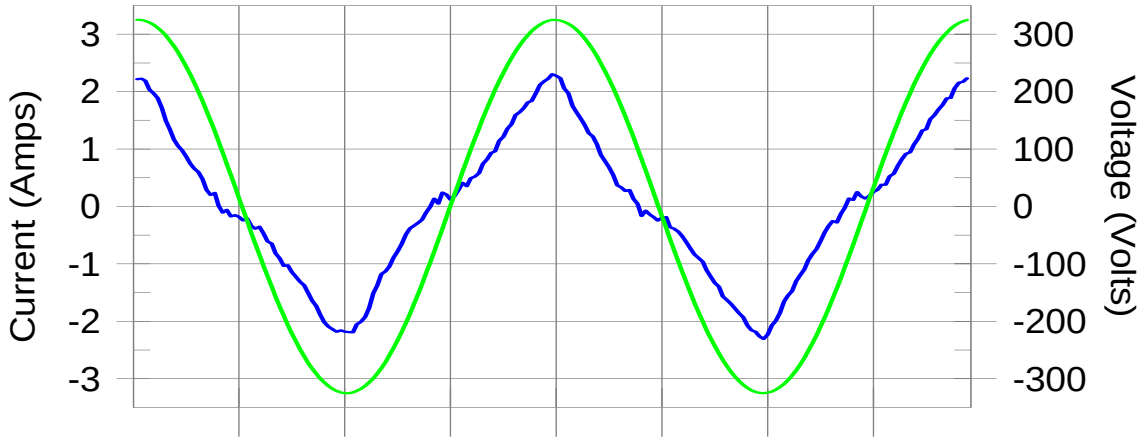
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.062	0.460	13.48	OK
3	0.504	2.069	24.36	OK
4	0.021	0.460	4.55	OK
5	0.039	0.920	4.24	OK
6	0.028	0.460	6.02	OK
7	0.018	0.690	2.68	OK
8	0.006	0.460	1.35	OK
9	0.048	0.460	10.49	OK
10	0.006	0.460	1.39	OK
11	0.017	0.230	7.34	OK
12	0.013	0.230	5.44	OK
13	0.011	0.230	4.64	OK
14	0.005	0.230	2.20	OK
15	0.007	0.230	2.93	OK
16	0.008	0.230	3.67	OK
17	0.015	0.230	6.47	OK
18	0.008	0.230	3.48	OK
19	0.019	0.230	8.27	OK
20	0.011	0.230	4.85	OK
21	0.015	0.230	6.69	OK
22	0.006	0.230	2.69	OK
23	0.018	0.230	7.89	OK
24	0.006	0.230	2.81	OK
25	0.006	0.230	2.42	OK
26	0.006	0.230	2.74	OK
27	0.018	0.230	7.91	OK
28	0.003	0.230	1.46	OK
29	0.027	0.230	11.77	OK
30	0.005	0.230	2.08	OK
31	0.019	0.230	8.17	OK
32	0.005	0.230	2.20	OK
33	0.008	0.230	3.31	OK
34	0.004	0.230	1.76	OK
35	0.008	0.230	3.49	OK
36	0.004	0.230	1.80	OK
37	0.020	0.230	8.72	OK
38	0.004	0.230	1.84	OK
39	0.018	0.230	7.94	OK
40	0.011	0.230	4.97	OK

Harmonics
(per EN 61000-3-2:2006 + A1:2009 + A2:2009)
– Class-A per Ed. 3.2 (2009)(Run time) incl. inter-harmonics

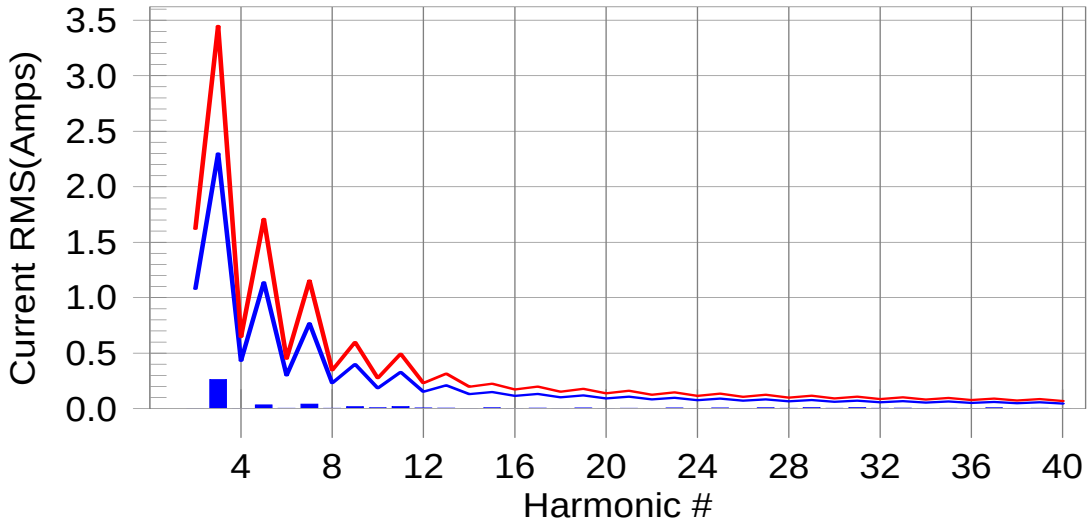
EUT: Super Storage Server (P/S: PWS-920P-1R) **Tested by: Alika Hirano**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 1:06:15 PM** **End time: 1:07:36 PM**
Test duration (min): 1 **Data file name: H-000382.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonic was #31 with 12.08% of the limit.

Current Test Result Summary (Run time)

EUT: Cascaded Storage Server (P/S: PWS-920P-1R) **Tested by: Alika Hirano**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 1:06:15 PM** **End time: 1:07:36 PM**
Test duration (min): 1 **Data file name: H-000382.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Source qualification: Normal**
THC(A): 0.27 **I-THD(%): 22.13** **POHC(A): 0.014** **POHC Limit(A): 0.302**
Highest parameter values during test:

V_RMS (Volts):	**229.97**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**2.365**	**I_RMS (Amps):**	**1.289**
I_Fund (Amps):	**1.228**	**Crest Factor:**	**1.857**
Power (Watts):	**279.8**	**Power Factor:**	**0.965**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	0.0	0.002	1.620	0.14	Pass
3	0.263	2.300	11.4	0.265	3.450	7.67	Pass
4	0.002	0.430	0.0	0.002	0.645	0.36	Pass
5	0.033	1.140	2.9	0.034	1.710	1.98	Pass
6	0.003	0.300	0.0	0.003	0.450	0.73	Pass
7	0.041	0.770	5.3	0.041	1.155	3.56	Pass
8	0.004	0.230	0.0	0.004	0.345	1.30	Pass
9	0.016	0.400	4.1	0.018	0.600	2.96	Pass
10	0.006	0.184	3.4	0.008	0.276	2.75	Pass
11	0.017	0.330	5.1	0.019	0.495	3.82	Pass
12	0.005	0.153	0.0	0.006	0.230	2.73	Pass
13	0.005	0.210	0.0	0.006	0.315	1.91	Pass
14	0.002	0.131	0.0	0.003	0.197	1.42	Pass
15	0.008	0.150	5.0	0.008	0.225	3.67	Pass
16	0.002	0.115	0.0	0.003	0.173	1.49	Pass
17	0.005	0.132	0.0	0.006	0.199	2.97	Pass
18	0.002	0.102	0.0	0.003	0.153	1.66	Pass
19	0.007	0.118	0.0	0.007	0.178	4.02	Pass
20	0.002	0.092	0.0	0.002	0.138	1.64	Pass
21	0.004	0.107	0.0	0.004	0.161	2.65	Pass
22	0.002	0.084	0.0	0.002	0.125	1.74	Pass
23	0.005	0.098	0.0	0.006	0.147	4.40	Pass
24	0.002	0.077	0.0	0.002	0.115	2.15	Pass
25	0.007	0.090	0.0	0.007	0.135	5.29	Pass
26	0.002	0.071	0.0	0.002	0.106	1.99	Pass
27	0.007	0.083	8.8	0.008	0.125	6.63	Pass
28	0.003	0.066	0.0	0.003	0.099	3.26	Pass
29	0.008	0.078	10.8	0.009	0.116	8.10	Pass
30	0.003	0.061	0.0	0.003	0.092	3.61	Pass
31	0.009	0.073	12.1	0.010	0.109	8.87	Pass
32	0.003	0.058	0.0	0.004	0.086	4.37	Pass
33	0.005	0.068	0.0	0.005	0.102	5.10	Pass
34	0.002	0.054	0.0	0.003	0.081	3.46	Pass
35	0.005	0.064	0.0	0.005	0.096	5.39	Pass
36	0.002	0.051	0.0	0.003	0.077	3.47	Pass
37	0.007	0.061	11.3	0.008	0.091	8.77	Pass
38	0.002	0.048	0.0	0.003	0.073	3.69	Pass
39	0.004	0.058	0.0	0.004	0.087	5.12	Pass
40	0.001	0.046	0.0	0.001	0.069	2.12	Pass

Voltage Source Verification Data (Run time)

EUT: Cascaded Storage Server (P/S: PWS-920P-1R) **Tested by: Alika Hirano**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 1:06:15 PM** **End time: 1:07:36 PM**
Test duration (min): 1 **Data file name: H-000382.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	**229.97**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**2.365**	**I_RMS (Amps):**	**1.289**
I_Fund (Amps):	**1.228**	**Crest Factor:**	**1.857**
Power (Watts):	**279.8**	**Power Factor:**	**0.965**

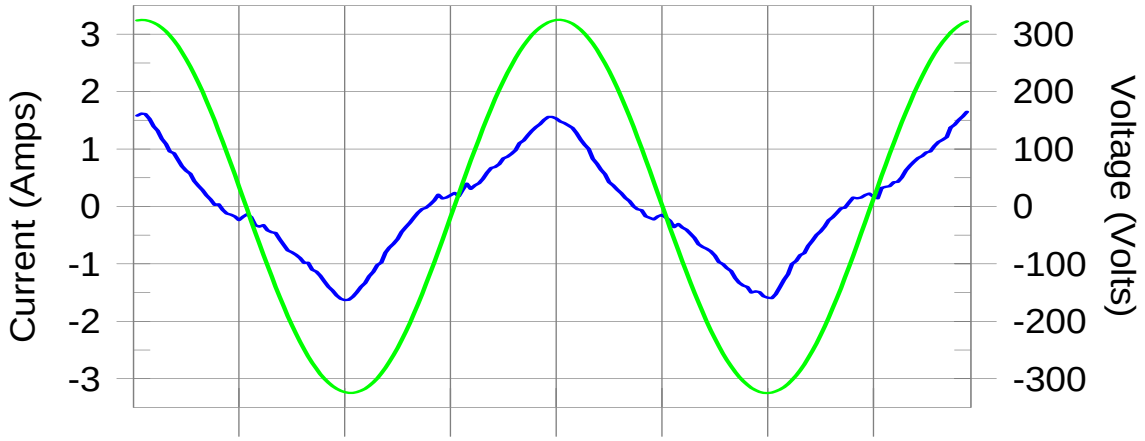
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.056	0.460	12.11	OK
3	0.499	2.070	24.13	OK
4	0.019	0.460	4.05	OK
5	0.029	0.920	3.15	OK
6	0.024	0.460	5.33	OK
7	0.037	0.690	5.34	OK
8	0.006	0.460	1.38	OK
9	0.060	0.460	13.14	OK
10	0.007	0.460	1.45	OK
11	0.030	0.230	13.17	OK
12	0.011	0.230	4.57	OK
13	0.010	0.230	4.20	OK
14	0.004	0.230	1.69	OK
15	0.006	0.230	2.59	OK
16	0.007	0.230	2.98	OK
17	0.014	0.230	6.30	OK
18	0.007	0.230	3.16	OK
19	0.014	0.230	5.97	OK
20	0.009	0.230	4.05	OK
21	0.010	0.230	4.14	OK
22	0.003	0.230	1.47	OK
23	0.010	0.230	4.40	OK
24	0.006	0.230	2.81	OK
25	0.008	0.230	3.50	OK
26	0.004	0.230	1.78	OK
27	0.006	0.230	2.69	OK
28	0.003	0.230	1.15	OK
29	0.008	0.230	3.61	OK
30	0.005	0.230	2.09	OK
31	0.012	0.230	5.21	OK
32	0.004	0.230	1.83	OK
33	0.007	0.230	2.84	OK
34	0.004	0.230	1.69	OK
35	0.007	0.230	3.02	OK
36	0.004	0.230	1.57	OK
37	0.012	0.230	5.03	OK
38	0.005	0.230	2.14	OK
39	0.004	0.230	1.84	OK
40	0.010	0.230	4.23	OK

Harmonics
(per EN 61000-3-2:2006 + A1:2009 + A2:2009)
– Class-A per Ed. 3.2 (2009)(Run time) incl. inter-harmonics

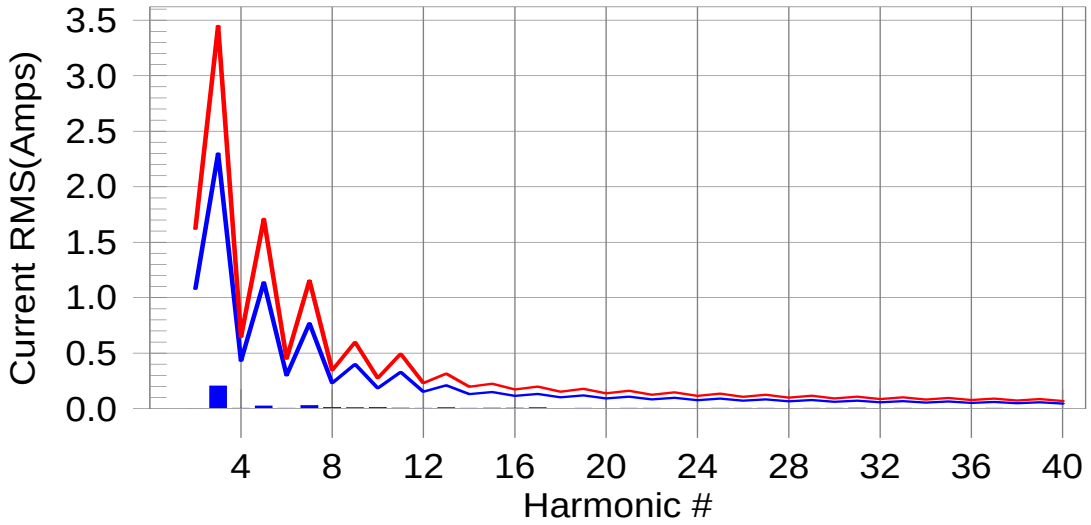
EUT: SSG-6047R-E1R24N **Tested by: Vishal Narayan**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 6:29:37 PM** **End time: 6:30:58 PM**
Test duration (min): 1 **Data file name: H-000371.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonic was #3 with 8.74% of the limit.

Current Test Result Summary (Run time)

EUT: SSG-6047R-E1R24N **Tested by: Vishal Narayan**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 6:29:37 PM** **End time: 6:30:58 PM**
Test duration (min): 1 **Data file name: H-000371.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Source qualification: Normal**
THC(A): 0.21 **I-THD(%): 23.92** **POHC(A): 0.000** **POHC Limit(A): 0.320**
Highest parameter values during test:

V_RMS (Volts):	**229.92**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**1.696**	**I_RMS (Amps):**	**0.908**
I_Fund (Amps):	**0.877**	**Crest Factor:**	**1.891**
Power (Watts):	**196.9**	**Power Factor:**	**0.950**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	0.0	0.003	1.620	0.15	Pass
3	0.201	2.300	8.7	0.204	3.450	5.92	Pass
4	0.003	0.430	0.0	0.004	0.645	0.56	Pass
5	0.024	1.140	2.1	0.024	1.710	1.43	Pass
6	0.003	0.300	0.0	0.004	0.450	0.87	Pass
7	0.028	0.770	3.6	0.029	1.155	2.49	Pass
8	0.010	0.230	4.2	0.011	0.345	3.17	Pass
9	0.007	0.400	1.7	0.008	0.600	1.39	Pass
10	0.010	0.184	5.3	0.011	0.276	4.02	Pass
11	0.006	0.330	1.7	0.006	0.495	1.19	Pass
12	0.004	0.153	0.0	0.005	0.230	2.08	Pass
13	0.007	0.210	3.4	0.007	0.315	2.36	Pass
14	0.002	0.131	0.0	0.003	0.197	1.65	Pass
15	0.005	0.150	3.5	0.006	0.225	2.49	Pass
16	0.004	0.115	0.0	0.005	0.173	3.03	Pass
17	0.008	0.132	5.9	0.008	0.199	3.99	Pass
18	0.002	0.102	0.0	0.002	0.153	1.29	Pass
19	0.005	0.118	0.0	0.005	0.178	2.75	Pass
20	0.002	0.092	0.0	0.002	0.138	1.80	Pass
21	0.004	0.107	0.0	0.004	0.161	2.79	Pass
22	0.003	0.084	0.0	0.004	0.125	2.84	Pass
23	0.001	0.098	0.0	0.002	0.147	1.10	Pass
24	0.002	0.077	0.0	0.002	0.115	1.87	Pass
25	0.003	0.090	0.0	0.004	0.135	2.69	Pass
26	0.003	0.071	0.0	0.004	0.106	3.66	Pass
27	0.004	0.083	0.0	0.004	0.125	3.49	Pass
28	0.002	0.066	0.0	0.003	0.099	2.73	Pass
29	0.005	0.078	0.0	0.005	0.116	4.41	Pass
30	0.004	0.061	0.0	0.004	0.092	4.67	Pass
31	0.005	0.073	6.8	0.005	0.109	4.77	Pass
32	0.002	0.058	0.0	0.003	0.086	3.14	Pass
33	0.004	0.068	0.0	0.004	0.102	3.93	Pass
34	0.002	0.054	0.0	0.002	0.081	2.93	Pass
35	0.002	0.064	0.0	0.002	0.096	2.59	Pass
36	0.002	0.051	0.0	0.002	0.077	2.55	Pass
37	0.003	0.061	0.0	0.003	0.091	3.45	Pass
38	0.002	0.048	0.0	0.003	0.073	3.76	Pass
39	0.003	0.058	0.0	0.003	0.087	3.48	Pass
40	0.001	0.046	0.0	0.001	0.069	1.58	Pass

Voltage Source Verification Data (Run time)

EUT: SSG-6047R-E1R24N **Tested by: Vishal Narayan**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 6:29:37 PM** **End time: 6:30:58 PM**
Test duration (min): 1 **Data file name: H-000371.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	**229.92**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**1.696**	**I_RMS (Amps):**	**0.908**
I_Fund (Amps):	**0.877**	**Crest Factor:**	**1.891**
Power (Watts):	**196.9**	**Power Factor:**	**0.950**

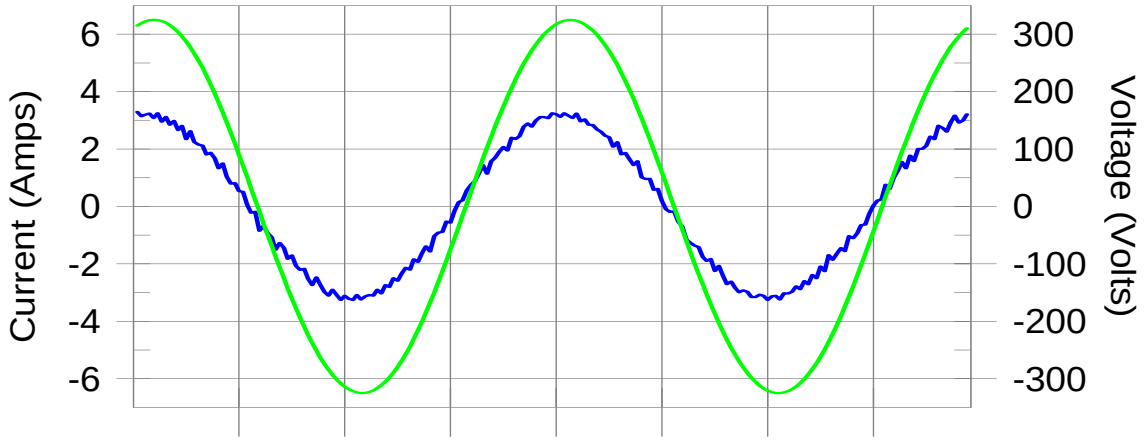
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.036	0.460	7.77	OK
3	0.494	2.069	23.88	OK
4	0.025	0.460	5.37	OK
5	0.032	0.920	3.44	OK
6	0.027	0.460	5.93	OK
7	0.032	0.690	4.58	OK
8	0.010	0.460	2.14	OK
9	0.051	0.460	11.13	OK
10	0.009	0.460	1.89	OK
11	0.017	0.230	7.58	OK
12	0.010	0.230	4.50	OK
13	0.005	0.230	2.11	OK
14	0.004	0.230	1.83	OK
15	0.008	0.230	3.49	OK
16	0.008	0.230	3.54	OK
17	0.006	0.230	2.82	OK
18	0.008	0.230	3.63	OK
19	0.009	0.230	4.11	OK
20	0.009	0.230	4.02	OK
21	0.009	0.230	3.94	OK
22	0.006	0.230	2.44	OK
23	0.011	0.230	4.97	OK
24	0.005	0.230	2.05	OK
25	0.003	0.230	1.50	OK
26	0.005	0.230	2.29	OK
27	0.008	0.230	3.35	OK
28	0.004	0.230	1.66	OK
29	0.010	0.230	4.15	OK
30	0.004	0.230	1.89	OK
31	0.007	0.230	3.23	OK
32	0.003	0.230	1.19	OK
33	0.007	0.230	2.91	OK
34	0.003	0.230	1.25	OK
35	0.003	0.230	1.24	OK
36	0.003	0.230	1.33	OK
37	0.005	0.230	2.29	OK
38	0.003	0.230	1.11	OK
39	0.006	0.230	2.78	OK
40	0.010	0.230	4.18	OK

Harmonics
(per EN 61000-3-2:2006 + A1:2009 + A2:2009)
– Class-A per Ed. 3.2 (2009)(Run time) incl. inter-harmonics

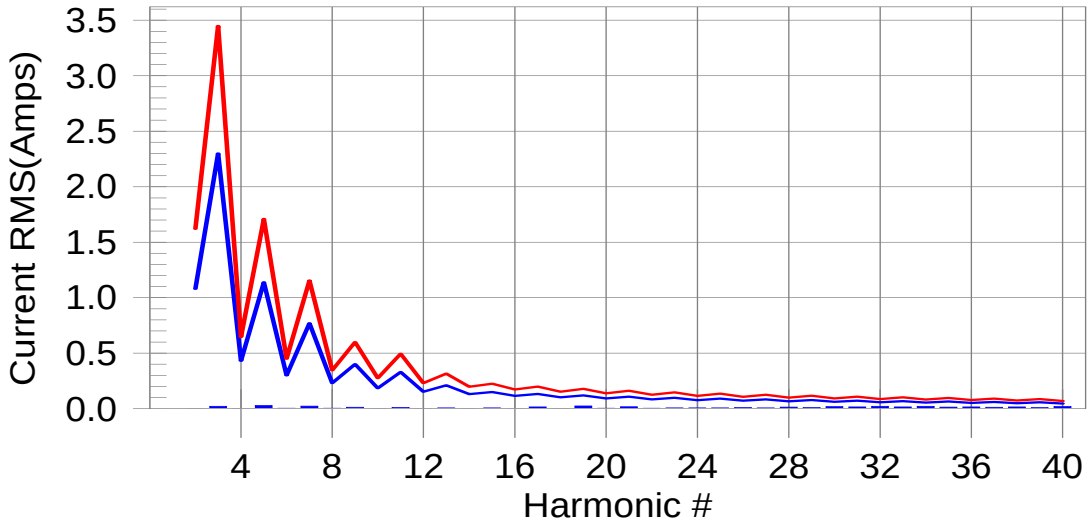
EUT: SSG-6047R-E1R36N **Tested by: Vishal Narayan**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 7:19:09 PM** **End time: 7:20:31 PM**
Test duration (min): 1 **Data file name: H-000375.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonic was #40 with 41.54% of the limit.

Current Test Result Summary (Run time)

EUT: SSG-6047R-E1R36N **Tested by: Vishal Narayan**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 7:19:09 PM** **End time: 7:20:31 PM**
Test duration (min): 1 **Data file name: H-000375.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Source qualification: Normal**
THC(A): 0.08 **I-THD(%): 3.59** **POHC(A): 0.050** **POHC Limit(A): 0.262**
Highest parameter values during test:

V_RMS (Volts):	**229.90**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**3.306**	**I_RMS (Amps):**	**2.155**
I_Fund (Amps):	**2.117**	**Crest Factor:**	**1.545**
Power (Watts):	**482.7**	**Power Factor:**	**0.990**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	0.0	0.003	1.620	0.18	Pass
3	0.020	2.300	0.9	0.021	3.450	0.61	Pass
4	0.003	0.430	0.0	0.003	0.645	0.48	Pass
5	0.028	1.140	2.5	0.029	1.710	1.69	Pass
6	0.003	0.300	0.0	0.003	0.450	0.72	Pass
7	0.022	0.770	2.9	0.022	1.155	1.94	Pass
8	0.003	0.230	0.0	0.003	0.345	0.98	Pass
9	0.011	0.400	0.0	0.012	0.600	1.99	Pass
10	0.003	0.184	0.0	0.003	0.276	1.10	Pass
11	0.011	0.330	0.0	0.011	0.495	2.25	Pass
12	0.002	0.153	0.0	0.003	0.230	1.17	Pass
13	0.007	0.210	0.0	0.007	0.315	2.28	Pass
14	0.003	0.131	0.0	0.003	0.197	1.46	Pass
15	0.006	0.150	0.0	0.007	0.225	2.97	Pass
16	0.003	0.115	0.0	0.003	0.173	1.68	Pass
17	0.015	0.132	11.3	0.016	0.199	8.04	Pass
18	0.003	0.102	0.0	0.003	0.153	1.95	Pass
19	0.024	0.118	20.2	0.024	0.178	13.72	Pass
20	0.003	0.092	0.0	0.004	0.138	2.71	Pass
21	0.016	0.107	15.2	0.017	0.161	10.35	Pass
22	0.005	0.084	0.0	0.005	0.125	4.06	Pass
23	0.006	0.098	0.0	0.007	0.147	4.70	Pass
24	0.006	0.077	0.0	0.007	0.115	5.99	Pass
25	0.005	0.090	0.0	0.007	0.135	5.17	Pass
26	0.009	0.071	0.0	0.010	0.106	9.31	Pass
27	0.006	0.083	0.0	0.007	0.125	5.58	Pass
28	0.014	0.066	20.7	0.014	0.099	14.21	Pass
29	0.009	0.078	0.0	0.010	0.116	8.37	Pass
30	0.018	0.061	29.7	0.019	0.092	20.25	Pass
31	0.014	0.073	19.6	0.015	0.109	13.47	Pass
32	0.021	0.058	37.0	0.022	0.086	25.23	Pass
33	0.016	0.068	23.1	0.016	0.102	16.07	Pass
34	0.020	0.054	37.7	0.021	0.081	26.15	Pass
35	0.014	0.064	21.5	0.014	0.096	14.86	Pass
36	0.016	0.051	31.6	0.017	0.077	21.52	Pass
37	0.011	0.061	0.0	0.012	0.091	12.91	Pass
38	0.016	0.048	32.1	0.016	0.073	22.12	Pass
39	0.010	0.058	0.0	0.010	0.087	11.84	Pass
40	0.019	0.046	41.5	0.020	0.069	29.00	Pass

Voltage Source Verification Data (Run time)

EUT: SSG-6047R-E1R36N **Tested by: Vishal Narayan**
Test category: Class-A per Ed. 3.2 (2009) (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 7:19:09 PM** **End time: 7:20:31 PM**
Test duration (min): 1 **Data file name: H-000375.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	**229.90**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**3.306**	**I_RMS (Amps):**	**2.155**
I_Fund (Amps):	**2.117**	**Crest Factor:**	**1.545**
Power (Watts):	**482.7**	**Power Factor:**	**0.990**

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.055	0.460	11.89	OK
3	0.487	2.069	23.54	OK
4	0.015	0.460	3.30	OK
5	0.035	0.920	3.84	OK
6	0.025	0.460	5.51	OK
7	0.018	0.690	2.58	OK
8	0.005	0.460	1.00	OK
9	0.048	0.460	10.51	OK
10	0.004	0.460	0.95	OK
11	0.014	0.230	5.98	OK
12	0.009	0.230	4.02	OK
13	0.005	0.230	2.01	OK
14	0.006	0.230	2.39	OK
15	0.008	0.230	3.56	OK
16	0.008	0.230	3.66	OK
17	0.014	0.230	6.09	OK
18	0.008	0.230	3.59	OK
19	0.022	0.230	9.46	OK
20	0.012	0.230	5.07	OK
21	0.015	0.230	6.38	OK
22	0.007	0.230	3.15	OK
23	0.013	0.230	5.86	OK
24	0.005	0.230	2.37	OK
25	0.005	0.230	2.32	OK
26	0.007	0.230	3.10	OK
27	0.008	0.230	3.51	OK
28	0.004	0.230	1.59	OK
29	0.013	0.230	5.52	OK
30	0.004	0.230	1.88	OK
31	0.010	0.230	4.56	OK
32	0.005	0.230	2.04	OK
33	0.014	0.230	6.23	OK
34	0.005	0.230	1.96	OK
35	0.020	0.230	8.78	OK
36	0.005	0.230	2.00	OK
37	0.018	0.230	7.62	OK
38	0.004	0.230	1.63	OK
39	0.018	0.230	7.91	OK
40	0.011	0.230	4.97	OK

Appendix D Voltage Fluctuations Test Data

Flicker Test Summary (EN(Run time)61000-3-3:2008)

EUT: Cascaded Storage Server (P/S: PWS-1K28P-SQ) **Tested by: Alika Hirano**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 11:13:57 AM** **End time: 11:46:10 AM**
Test duration (min): 120 **Data file name: F-000380.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Status: Test Aborted**

Pst_i and limit line **European Limits**

Plt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	**229.91**			
Highest dt (%):	**0.00**	**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 (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**

Highest Plt (2 hr. period): ***Not evaluated. Over two observation periods the value of Pst was less than 0.2, indicating that the device under test did not produce significant voltage fluctuations. As Pst was less than 0.2, Plt would also be less than 0.2.***

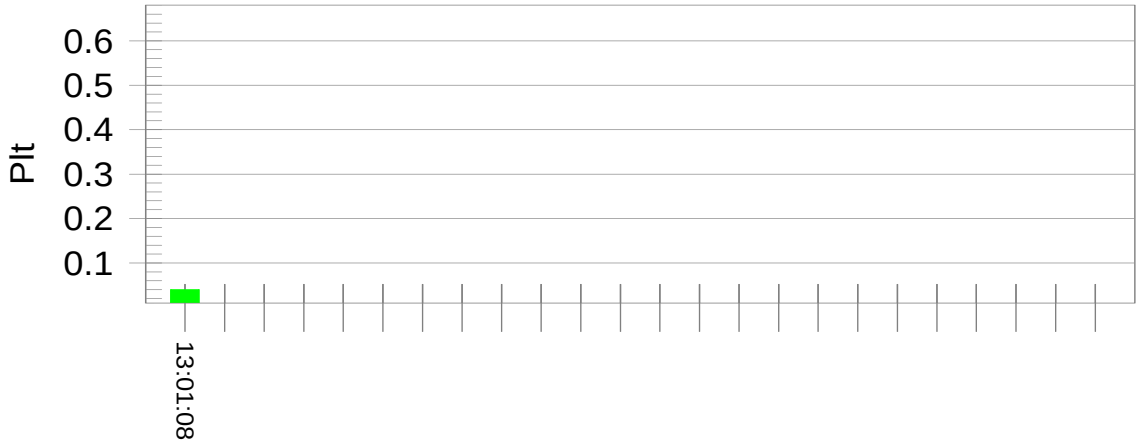
Flicker Test Summary (EN(Run time)61000-3-3:2008)

EUT: Cascaded Storage Server (P/S: PWS-920P-1R) **Tested by: Alika Hirano**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 4/11/2012 **Start time: 12:30:28 PM** **End time: 1:02:46 PM**
Test duration (min): 120 **Data file name: F-000381.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer, Inc.

Test Result: Pass **Status: Test Aborted**

Pst_i and limit line **European Limits**

Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**229.92**			
Highest dt (%):	**0.00**	**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 (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**

Highest Plt: ***Not evaluated. Over two observation periods the value of Pst was less than 0.2, indicating that the device under test did not produce significant voltage fluctuations. As Pst was less than 0.2, Plt would also be less than 0.2.***

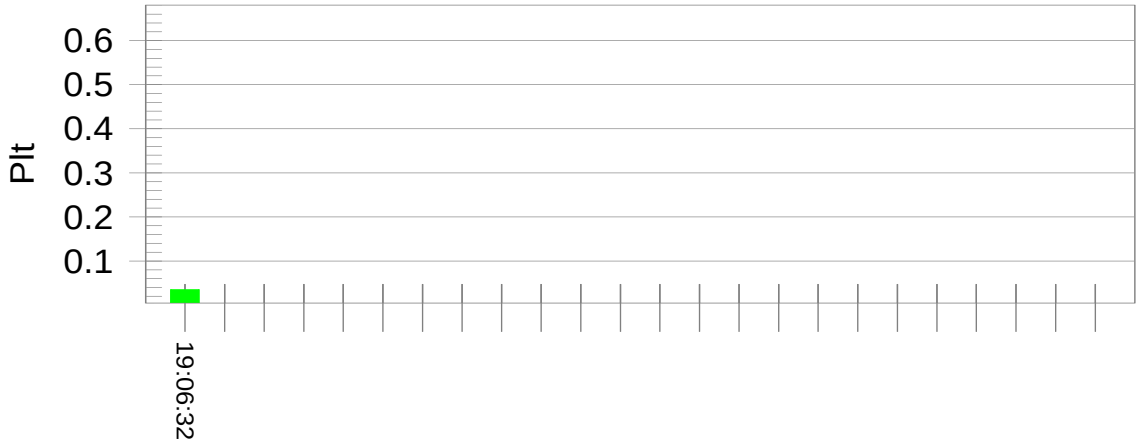
Flicker Test Summary (EN(Run time)61000-3-3:2008)

EUT: SSG-6047R-E1R24N **Tested by: Vishal Narayan**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 6:45:52 PM** **End time: 7:11:19 PM**
Test duration (min): 120 **Data file name: F-000372.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Status: Test Aborted**

Pst_i and limit line **European Limits**

Plt and limit line



Parameter values recorded during the test:

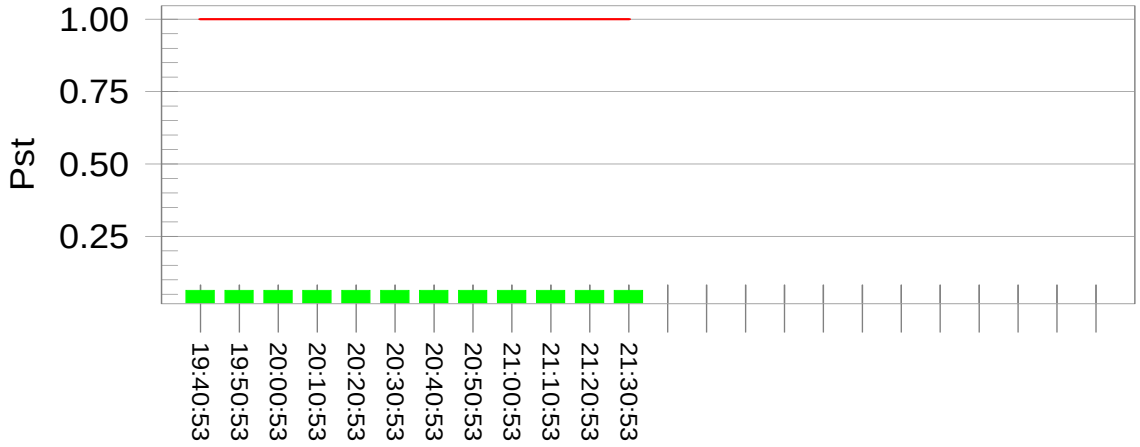
Vrms at the end of test (Volt):	**229.91**			
Highest dt (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Time(mS) > dt:	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.035**	**Test limit:**	**0.650**	**Pass**

Flicker Test Summary (EN(Run time)61000-3-3:2008)

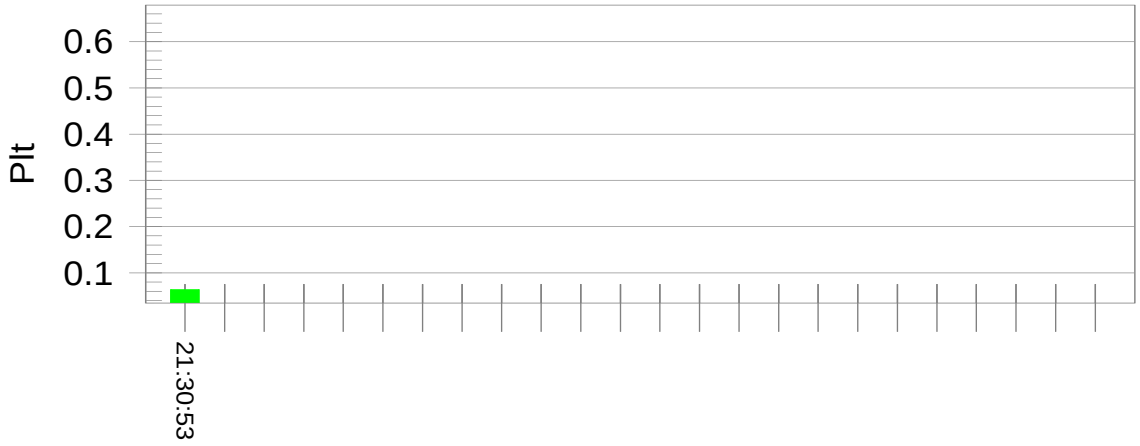
EUT: SSG-6047R-E1R36N **Tested by: Vishal Narayan**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 4/3/2012 **Start time: 7:30:13 PM** **End time: 9:30:54 PM**
Test duration (min): 120 **Data file name: F-000376.cts_data**
Comment: J87050/T87058
Customer: Supermicro Computer

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



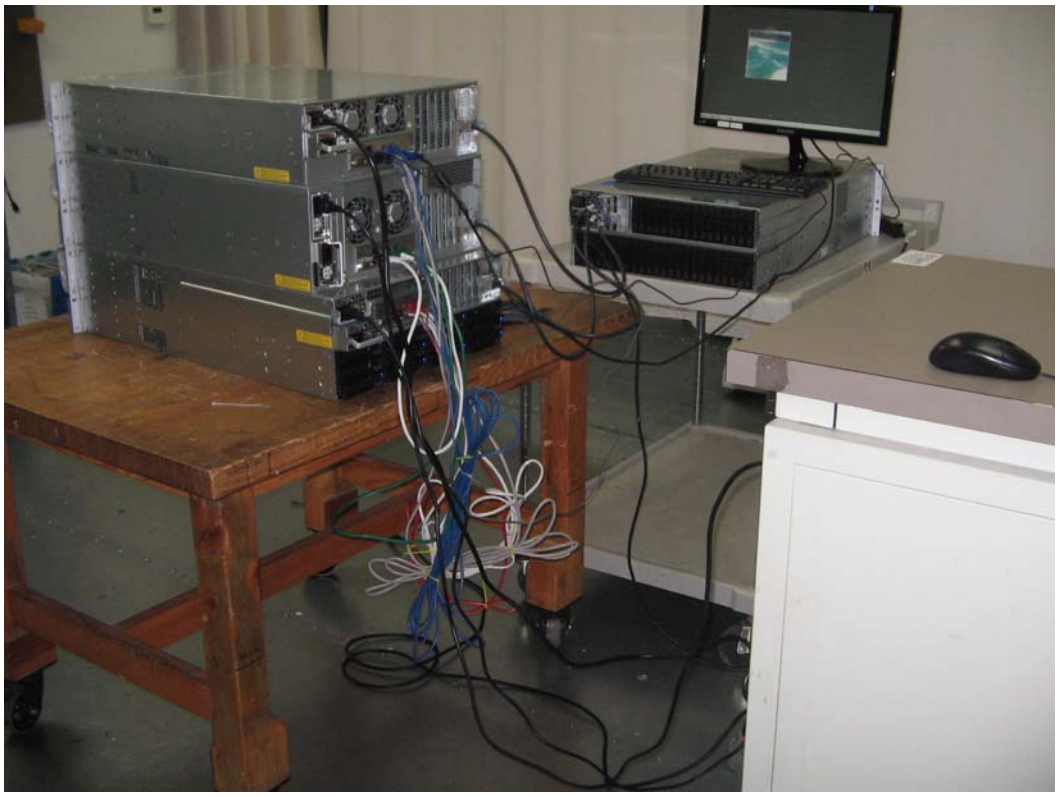
Plt and limit line



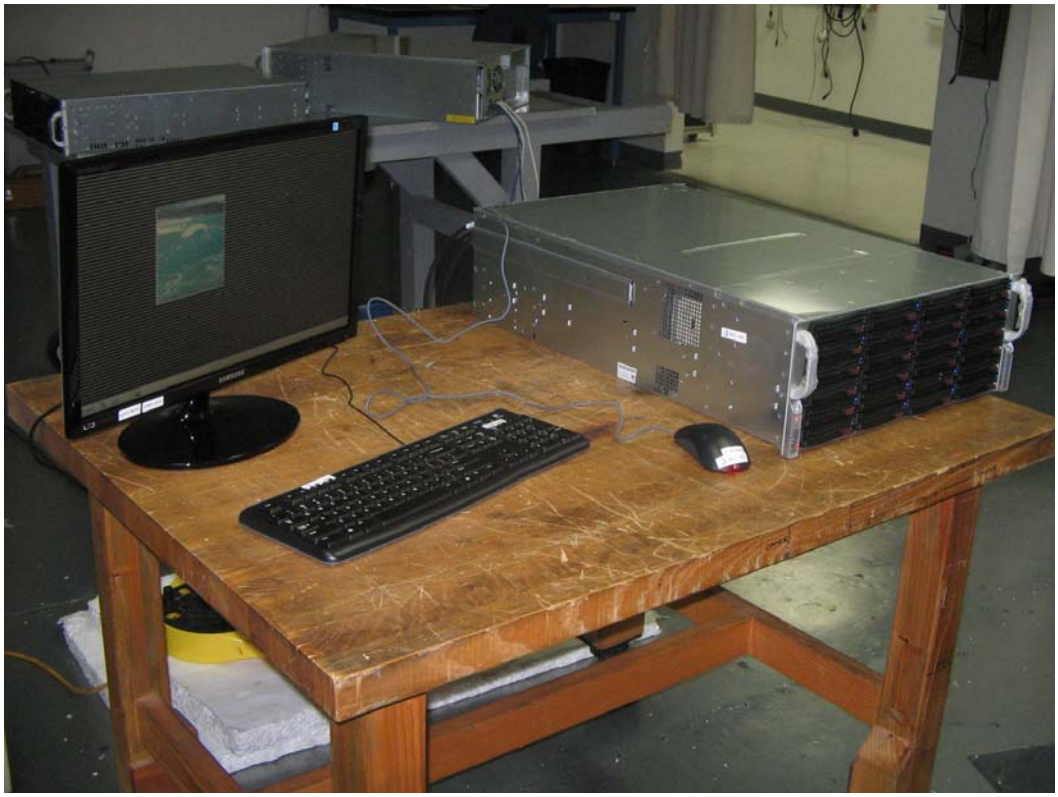
Parameter values recorded during the test:

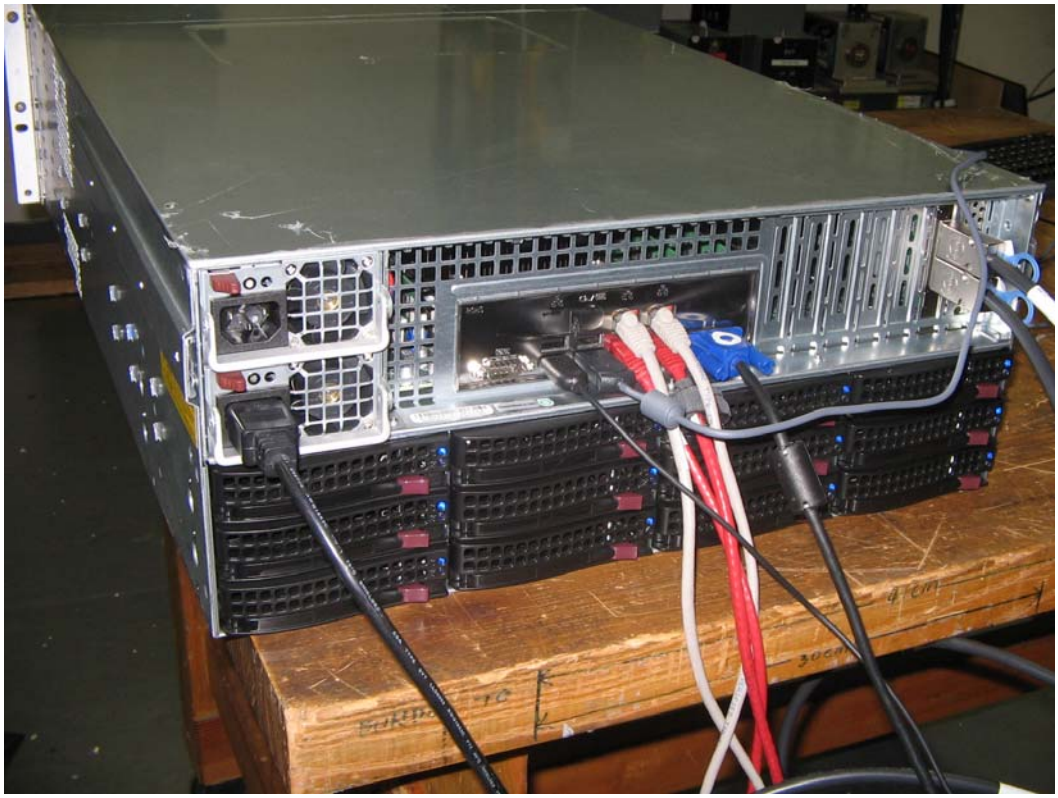
Vrms at the end of test (Volt):	**229.88**			
Highest dt (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Time(mS) > dt:	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.064**	**Test limit:**	**0.650**	**Pass**

Appendix E AC Current Harmonics and Voltage Fluctuations Test Configuration Photographs

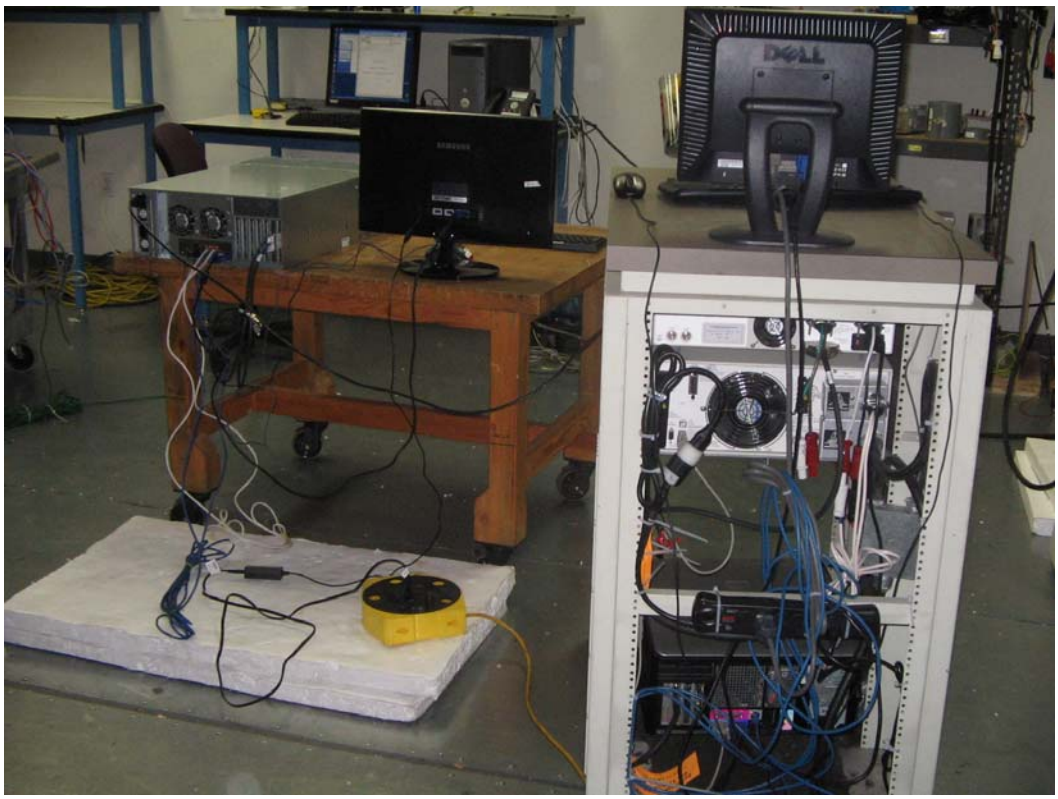


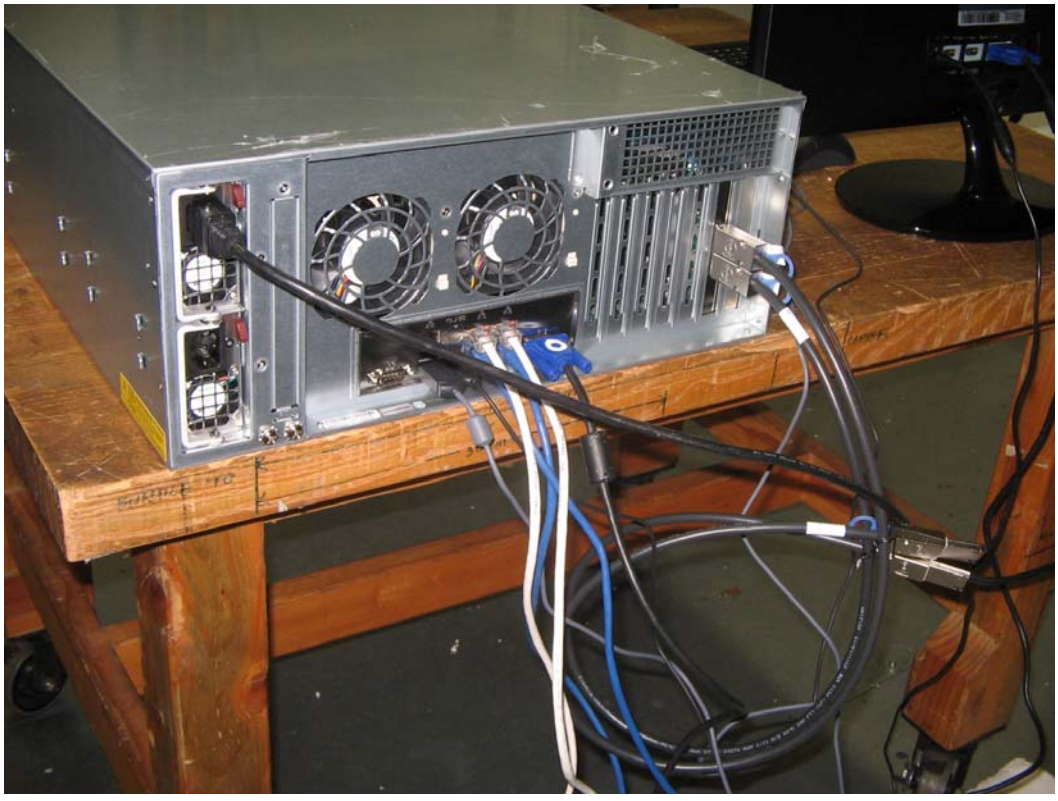
SSG-6047R-E1R36N





SSG-6047R-E1R24N





Appendix F Product Labeling Requirements

The following information has been provided to clarify notification, equipment labeling requirements and information that must be included in the operator's manual. These requirements may be found in the standards/regulations listed in the scope of this report.

Label Location

The required label(s) must be in a *conspicuous location* on the product, which is defined as any location readily visible to the user of the device without the use of tools.

Label Attachment

The label(s) must be *permanently attached* to the product, which is defined as attached such that it can normally be expected to remain fastened to the equipment during the equipment's expected useful life. A paper gum label will generally not meet this condition.

United States Class A Label

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European and Australian Class A Label

Warning - This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japanese Class A Label

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI－A

The English translation for the labeling text is: *This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.*

Industry Canada

For ICES-003 (digital apparatus), the product must be labeled with a notice indicating compliance e.g.

This Class A digital apparatus complies with Canadian ICES-003

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada

If there is limited space on the product then the text may be placed in the manual.

Appendix G User Manual Regulatory Statements

Where special accessories, such as shielded cables, are required in order to meet the emission limits, appropriate instructions regarding the need to use such accessories must be contained on the first page of text concerned with the installation of the device in the operator's manual.

A requirement by FCC regulations, and recommended for all regulatory markets, is a cautionary statement to the end user that changes or modifications to the device not expressly approved by you, the manufacturer, could void their right to operate the equipment.

United States Class A Manual Statement

> **NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Additional information about corrective measures may also be provided to the user at the company's option.

The FCC has indicated that the radio interference statement be bound in the same manner as the operator's manual. Thus, a loose-leaf insert page in a bound or center-spine and stapled manual would not meet this condition.

European and Australian Class A Manual Statement

> Warning - This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Note: This statement is not required if it is provided on a label affixed to the product.

Japanese Class A Manual Statement

> この装置は、クラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 ＶＣＣＩ－Ａ

The English translation for the text is: *This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.*

Appendix H Additional Information for VCCI

The VCCI requires a notification for each product sold with the VCCI label. A notification letter on your company letterhead with 2 copies of Form 1 must be sent to the VCCI in Japan at the following address:

Voluntary Control Council for
Interference by Information Technology Equipment
NOA Building, 7th Floor
3-5 Azabudai 2-chome, Minato-ku,
Tokyo 106-0041, Japan

You may also submit the form electronically on the VCCI web site http://www.vcci.or.jp/vcci_e/member/index.html. Go to "Documents and Forms, Report of Compliance" in Members only section. Enter your username and password and click "OK". Then click "Please click here if you submit report of compliance electronically" to open the submission form. Fill all required columns and click "CONFIRM" after making sure everything is filled properly.

Appendix I Additional Information for Australia and New Zealand

In Australia, an application to use the C-Tick mark must be made by the importer of the product. The importer must hold a Declaration of Conformity and compliance folder, of which this report forms a part, for each product sold with a C-Tick mark.

The European harmonized standards and international (CISPR/IEC) standards are acceptable for demonstrating compliance with the Australian/New Zealand compliance framework. This is explained in the document "Electromagnetic Compatibility - Information for suppliers of electrical and electronic products in Australia and New Zealand", dated July 2003. While this document is being revised information can be found on the Australian Communications and Media Authority (ACMA) website by following links from their homepage (http://www.acma.gov.au/WEB/HOMEPAGE/pc=HOME) to EMC compliance & labeling regulatory arrangements.

Appendix J Basic and Reference Standards

Subpart B of Part 15 of FCC Rules for digital devices.

FCC Part 15 Subpart B references the use of ANSI C63.4–2003: "*Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*" for the purposes of evaluating the radiated and conducted emissions from digital devices.

VCCI Regulations For Information Technology Equipment, dated April 2009

The VCCI Regulations For Voluntary Control Measures of radio interference generated by Information Technology Equipment make reference to the following National and International standards for the purposes of making measurements. Elliott's test procedures associated with measurements against VCCI rules use these standards in addition to the procedures laid out in the VCCI regulations.

Standard	Description / Title
CISPR 22: Ed 5.2:2006	Information Technology Equipment – Radio disturbance characteristics - Limits and methods of measurement
CISPR 16-1-1 Ed2.1:2006	Specification for radio disturbance and immunity measuring apparatus and method – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus.
CISPR 16-1-2 Ed1.2:2006	Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Measuring apparatus – Ancillary equipment – Conducted disturbances
CISPR 16-1-4 Ed2.0:2007	Specification for radio disturbance and immunity measuring apparatus and methods –Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radio disturbances
CISPR 16-2-3 Ed1.0:2003	Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbance and immunity – Radiated disturbance measurements
CISPR 16-4-2 Ed1.0:2003	Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements
ANSI C63.4:2003	American National Standard for Method of Measurement of Radio Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range 9kHz to 40 GHz.

EN 55022:2010

EN 55022 references various international and European standards to be used when making the required measurements. The references all cite dated versions of the standards, therefore the editions cited are used.

International and EN equivalent standard	Description	Standard Used
CISPR 16-1-1:2006 +A1:2006 EN 55016-1-1:2007 +A1:2007	Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	CISPR 16-1-1 2006 +A1:2006 +A2:2007
CISPR 16-1-2:2003 +A1:2004 +A2:2006 EN 55016-1-2:2004 +A1:2005 +A2:2006	Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	CISPR 16-1-2:2003 +A1:2004 +A2:2006
CISPR 16-1-4:2007 EN 55016-1-4: 2007	Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Radiated disturbances	CISPR 16-1-4:2007
CISPR 16-2-3:2003 +A1:2005 EN 55016-2-3:2004 +A1:2005	Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements	CISPR 16-2-3:2006
CISPR 16-4-2:2003 EN 55016-4-2 2004	Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling - Uncertainty in EMC measurements	CISPR 16-4-2:2003
Unless the international publication has been modified by common modifications, indicated by ***(mod)***, either the intentional or the EN standard may be used. Where the EN standard differs from the intentional standard then the EN version is used. For all of the standards listed above there are no common modifications therefore Elliott makes use of the international version of all standards listed.		

CISPR 22:2008

CISPR 22 references various IEC basic standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions are used.

International and EN equivalent standard	Description	Standard Used
CISPR 16-1-1:2006 +A1:2006 +A2:2007 EN 55016-1-1:2007 +A1:2007 +A2:2008	Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	CISPR 16-1-1:2006 +A1:2006 +A2:2007
CISPR 16-1-2:2003 +A1:2004 +A2:2006 EN 55016-1-2 2004 + A1 2005	Specification for radio disturbance and immunity measuring apparatus and methods –Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	CISPR 16-1-2:2003 +A1:2004 +A2:2006
CISPR 16-1-4:2007 EN 55016-1-4: 2007	Specification for radio disturbance and immunity measuring apparatus and methods –Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Radiated disturbances	CISPR 16-1-4:2007
CISPR 16-2-3:2006 EN 55016-2-3:2006	Specification for radio disturbance and immunity measuring apparatus and methods –Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements	CISPR 16-2-3:2006
CISPR 16-4-2 2003 EN 55016-4-2 2004	Specification for radio disturbance and immunity measuring apparatus and methods –Part 4-2: Uncertainties, statistics and limit modeling - Uncertainty in EMC measurements	CISPR 16-4-2 2003
Unless the international publication has been modified by common modifications, indicated by ***(mod)***, either the intentional or the EN standard may be used. Where the EN standard differs from the intentional standard then the EN version is used. For all of the standards listed above there are no common modifications therefore Elliott makes use of the international version of all standards listed.		

EN 55024:2010

EN 55024 references various European standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions (or its international equivalent) are used.

Referenced standard	Description	Standard Used
IEC 60050-161:1990	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	IEC 60050-161:1990
IEC 60318-1:2009 EN 60318-1:2009	Electroacoustics - Simulators of human head and ear - Part 1: Ear simulator for the measurement of supra-aural and circumaural earphones	N/A (The EUT tested did not require the use of an ear simulator)
IEC 61000-4-2:2008 EN 61000-4-2:2009	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques -" Section 2: Electrostatic discharge immunity test	IEC 61000-4-2:2008 EN 61000-4-2:2009
IEC 61000-4-3:2006 +A1:2007 +A2:2010 EN 61000-4-3:2006 +A1 :2008 +A2 :2010	Section 3: Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3:2006 A1:2007 A2:2010 EN 61000-4-3:2006 A1:2008 A2:2010
IEC 61000-4-4:2004 EN 61000-4-4 :2004	Section 4: Electrical fast transient/burst immunity test	IEC 61000-4-4:2004 A1:2010 EN 61000-4-4:2004 A1:2010
IEC 61000-4-5: 2005 EN 61000-4-5 :2006	Section 5: Surge immunity test	IEC 61000-4-5:2005 EN 61000-4-5:2006
IEC 61000-4-6 :2008 EN 61000-4-6 :2009	Section 6: Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6:2008 EN 61000-4-6:2009
IEC 61000-4-8 :2009 EN 61000-4-8 :2010	Section 8: Power frequency magnetic field immunity test	IEC 61000-4-8 2009 EN 61000-4-8:2010
IEC 61000-4-11:2004 EN 61000-4-11:2004	Section 11: Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11:2004 EN 61000-4-11:2004
CISPR 16-1-2 :2003 A+1 :2004 +A2 :2006 EN 55016-1-2 :2004 +A1 :2005 +A2 :2006	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	CISPR 16-1-2 :2003 A+1 :2004 +A2 :2006 EN 55016-1-2 :2004 +A1 :2005 +A2 :2006
CISPR 20 :2006 EN 55020 :2007	Sound and television broadcast receivers and associated equipment – Immunity characteristics - Limits and methods of measurement	CISPR 20 :2006 EN 55020 :2007
CISPR 22 :2008 (mod) EN 55022 2010	Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement	CISPR 22 :2008 (mod) EN 55022 2010

CISPR 24:2010

CISPR 24 references various IEC basic standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions are used.

Referenced standard	Description	Standard Used
IEC 60050-161:1990	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	IEC 60050-161:1990
IEC 60318-1:2009	Electroacoustics - Simulators of human head and ear - Part 1: Ear simulator for the measurement of supra-aural and circumaural earphones	N/A (The EUT tested did not require the use of an ear simulator)
IEC 61000-4-2:2008	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques -" Section 2: Electrostatic discharge immunity test	IEC 61000-4-2:2008 EN 61000-4-2:2009
IEC 61000-4-3:2006 +A1:2007 +A2:2010	Section 3: Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3:2006 +A1:2007 +A2:2010 EN 61000-4-3:2006 +A1:2008 +A2:2010
IEC 61000-4-4:2004	Section 4: Electrical fast transient/burst immunity test	IEC 61000-4-4:2004 +A1:2010 EN 61000-4-4:2004 +A1:2010
IEC 61000-4-5: 2005	Section 5: Surge immunity test	IEC 61000-4-5:2005 EN 61000-4-5:2006
IEC 61000-4-6 :2008	Section 6: Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6:2008 EN 61000-4-6:2009
IEC 61000-4-8 :2009	Section 8: Power frequency magnetic field immunity test	IEC 61000-4-8:2009 EN 61000-4-8:2010
IEC 61000-4-11:2004	Section 11: Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11:2004 EN 61000-4-11:2004
CISPR 16-1-2 :2003 +A1 :2004 +A2 :2006	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	CISPR 16-1-2:2003 +A1 :2004 +A2 :2006 EN 55016-1-2:2004 +A1:2005 +A2:2006
CISPR 20 :2006	Sound and television broadcast receivers and associated equipment – Immunity characteristics - Limits and methods of measurement	CISPR 20:2006 EN 55020:2007
CISPR 22 :2008	Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement	CISPR 22 :2008 (mod) EN 55022 :2010

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