CERTIFICATE OF COMPLIANCE

Certificate No.	Date of Issue.
K1064810.00	25/12/2011

Applicant Name	RADWARE Ltd.
Applicant Address	22 Raul Wallenburg St., Tel-Aviv, 61131, Israel
Product	Network Switch
Model / Type Ref.	ODS3-XL With Redundant 500W AC Power Supply (See Notes on following page).
Rating	500W
Tested to	CISPR 22 Edition 5.2: 2006, Class: A; VCCI: 2010
Test Results are detailed in the Test Report No.	E1064810.00

This is to certify that the product specified herein has been tested & the test results were found compliant with the requirements noted above.

Certification Dept.

Bat-Sheva St.1 POB 87, Lod 71100 Israel Tel. 972-8-9153100 Fax. 972-8-9153101 standard@itl.co.il I www.itl.co.il

CERTIFICATE OF COMPLIANCE

Notes:

See customer's declaration dated 04 July 2010 in ITL test report no. E1064810.00 for additional model names.

Bat-Sheva St.1 POB 87, Lod 71100 Israel Tel. 972-8-9153100 Fax. 972-8-9153101 standard@itl.co.il I www.itl.co.il

CERTIFICATE OF COMPLIANCE

Certificate No. K1064811.00

Date of Issue. 25/12/2011

Applicant Name: RADWARE Ltd.

Applicant Address: 22 Raul Wallenburg St., Tel-Aviv, 61131, Israel

Product: Network Switch

Model / Type Ref.: ODS3-XL With Redundant 500W DC Power Supply (See Notes on following page).

Rating: 500W

Tested to: CISPR 22 Edition 5.2: 2006, Class: A; VCCI: 2010

Test Results are detailed in the Test Report No. E1064811.00

This is to certify that the product specified herein has been tested & the test results were found compliant with the requirements noted above.

Certification Dept.

Bat-Sheva St.1 POB 87, Lod 71100 Israel Tel. 972-8-9153100 Fax. 972-8-9153101 standard@itl.co.il I www.itl.co.il

CERTIFICATE OF COMPLIANCE

Notes:

See customer's declaration dated 04 July 2010 in ITL test report no. E1064811.00 for additional model names.

Bat-Sheva St.1 POB 87, Lod 71100 Israel Tel. 972-8-9153100 Fax. 972-8-9153101 standard@itl.co.il I www.itl.co.il

ISRAEL TESTING LABORATORIES
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ACCREDITED
TESTING Cert No.1152.01

DATE: 25 December 2011

I.T.L. (PRODUCT TESTING) LTD.

VCCI EMC Test Report

for

RADWARE Ltd.

Equipment under test:

Network Switch

ODS3-XL With Redundant 500W AC Power Supply*

* See customer's declaration on page 4.

Written by: _____
D. Shidlowsky, Documentation

Approved by: _____
Y. Mordukhovitch, Test Engineer

Approved by: _____
I. Raz, EMC Laboratory Manager

TABLE OF CONTENTS

1. General Information

1.1 Administrative Information

Manufacturer:	RADWARE Ltd.
Manufacturer's Address:	22 Raul Wallenberg St. Tel-Aviv Israel 61131 Tel: +972-3-766-8900 Fax: +972-3-766-8922
Manufacturer's Representative:	Yaniv Ben-Dor
Equipment Under Test (E.U.T):	Network Switch
Equipment Model No.:	ODS3-XL With Redundant 500W AC Power Supply (See customer's declaration on following page)
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	30.10.2011
Start of Test:	02.11.2011
End of Test:	07.11.2011
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 71100
Test Specifications:	See Section 2

radware

July 4th , 2010

Declaration of Similarity

I HEREBY DECLARE THAT THE FOLLOWING PRODUCTS:

RODS3-DEFAULT-ND
RODS3XL-DEFAULT
RODS3-ALTEON
RODS3XL-ALTEON
RODS3XL-S1-DEF
RODS3XL-S2N-DEF
ODS3 v. 2
AppDirector
AppDirector XL
LinkProof
AppWall
AppXcel
AppXML
SIP Director
Alteon 5412
Alteon 5412 XL
InFlight
Virtual Director
APSolute Vision
DefensePro
Content Inspection Director (CID)
OnDemand Switch 3 v.2
OnDemand Switch 3 XL

ARE IDENTICAL ELECTRONICALLY, PHYSICALLY, AND MECHANICALLY TO:

ODS3 -XL

Please relate to them all (from an EMC & safety point of view) as the same product.

Thank You,

Yaniv Ben-Dor
Engineering Manager
Radware Ltd.

Legal Signature

RADWARE Ltd.
22 Raoul Wallenberg
Tel-Aviv 69710
ISRAEL

1.2 Abbreviations and Symbols

The following abbreviations and symbols are applicable to this test report:

A/m	ampere per meter
AC	alternating current
AM	amplitude modulation
ARA	Antenna Research Associates
Aux	auxiliary
Avg	average
CDN	coupling-decoupling network
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dbµV	decibel referred to one microvolt
dbµV/m	decibel referred to one microvolt per meter
DC	direct current
EFT/B	electrical fast transient/burst
EMC	electromagnetic compatibility
ESD	electrostatic discharge
E.U.T.	equipment under test
GHz	gigahertz
HP	Hewlett Packard
Hz	Hertz
kHz	kilohertz
kV	kilovolt
LED	light emitting diode
LISN	line impedance stabilization network
m	meter
mHn	millihenry
MHz	megahertz
msec	millisecond
N/A	not applicable
per	period
QP	quasi-peak
PC	personal computer
RF	radio frequency
RE	radiated emission
sec	second
V	volt
V/m	volt per meter
VRMS	volts root mean square

1.3 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 861911.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-3006, R-2729, T-1877, G-245.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025A-1.
6. TUV Product Services, England, ASLLAS No. 97201.

I.T.L. Product Testing Ltd. is accredited by the American association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

2. Applicable Documents

2.1	**CISPR 22 Edition 5.2: 2006**	*Limits and Methods Measurement of Radio Disturbance Characteristics of the Information Technology Equipment.*
2.2	**VCCI: 2010**	*Agreement of Voluntary Control Council for Interference by Information Technology*

3. Test Site Description

3.1 Location:

The Electromagnetic Compatibility Test Facility of I.T.L. (Product testing) Ltd. Is located at
Telrad Industrial Park, Lod, 71100 Israel.
Telephone: +972-8-9153100
Fax: +972-8-9153101

3.2 Open Site:

The OATS is located on a one floor-building roof. The OATS consists of 3 meter and 10 meter ranges, using a 21.5m X 8.5m solid metal ground plane, a remote controlled turntable and an antenna mast.

3.3 Ground Plane:

The ground plane is made from steel plates, which are welded continuously together. The Ground plane is lies and welded on welded steel construction with vias to allow for water drainage.
All the power, control, and signal lines to the turntable and the 3 m and 10m antenna mast outlets are routed in shielded conduits under the plane to the control building.

3.4 Antenna Mast:

ETS model 2070-2. The antenna position and polarization are remote controlled via Fiber Optical Link using ETS/EMCO Dual Controller Type 2090. The antenna position is adjustable between 1-4 meters. Pressurized air is used to power changing the polarity of the antenna.

3.5 Turntable:

ETS model 2087 series. The position of the turntable is remote-controlled via Fiber Optic Link, using ETS/EMCO Dual Controller Type 2090. The turntable is mounted in a pit and its surface is flush with the Open Site Ground Plane. Brushes near the periphery of the turntable ensure good conductive connection to the ground plane. The Turntable maximum load is 1250 Kg.

3.6 EMI Receiver:

Type HP8542E, including HP85420E R.F. filter manufactured by Hewlett-Packard, being in full compliance with CISPR 16 requirements.

3.7 E.U.T. Support:

Table mounted E.U.T.s are supported during testing on 80 cm high all-wooden tables (no metal nails or screws).

3.8 Test Equipment:

See details in Section 6.

3.9 VCCI Registration

VCCI Registration Numbers: C-3006, R-2729, T-1877, G-245

4. Summary of Test Results

Test	Results
Conducted Emissions CISPR 22 Edition 5.2: 2006, Class A	The E.U.T met the performance requirements of the specification. The margin between the emission levels and the specification limit was, in the worst case, 19.5 dB for the phase line at 0.20 MHz and 16.5 dB for the neutral line at 0.20 MHz.
Conducted Emissions From Telecommunication Ports CISPR 22 Edition 5.2: 2006, Class A	The E.U.T met the performance requirements of the specification. The margin between the emission levels and the specification limit was, in the worst case, 22.2 dB for the SFP1 Port at 4.53 MHz. The margin between the emission levels and the specification limit was, in the worst case, 33.3 dB for the LAN Port 1 at 0.17 MHz. The margin between the emission levels and the specification limit was, in the worst case, 18.4 dB for the Management Port at 0.49 MHz.
Radiated Emissions CISPR 22 Edition 5.2: 2006, Class A	The E.U.T met the performance requirements of the specification. The margin between the emission level and the specification limit was 8.6 dB in the worst case at the frequency of 84.04 MHz, horizontal polarization.

5. Equipment Under Test (E.U.T.) Description

OnDemand Switch™, Radware's next-generation hardware platform, delivers the breakthrough performance and superior scalability needed to effectively meet contemporary network and business needs. Specifically designed for the majority of enterprises and carriers that operate in dynamic, ever-changing environments and face diverse requirements, OnDemand Switch provides the extendable throughput they need from 0-20 Gbps for unparalleled scalability, business availability and performance. With OnDemand Switch you can add additional application-aware services on demand to meet new or changing application and infrastructure requirements without a compromise on performance. And, thanks to its one-click service and throughput upgrade capabilities, OnDemand Switch delivers both short-term and long-term savings on CAPEX and OPEX for full investment protection. OnDemand Switch represents a paradigm shift in the application delivery marketplace by providing customers with a new, cost effective and hassle-free upgrade standard.

On Demand Performance at All Throughput Requirements

As data-center complexity increases in terms of servers, applications, technologies and capacity, and there are clear requirements from the network to be more application-aware and add more application intelligence and services, application delivery solutions need to meet these growing requirements with more sophisticated, powerful switching capabilities. OnDemand Switch delivers unmatched performance up to 20 Gbps of throughput. Thanks to its revolutionary, rock-solid architecture, OnDemand Switch provides the best application delivery performance at all throughput levels to support all layer 4-7 network requirements. Whenever your network faces heavier traffic loads and you business require higher throughput levels, OnDemand Switch still provides the best performance at all times.

On Demand Throughput and Service Scalability

OnDemand Switch meets business growth demand by enabling customers to scale up performance by increasing throughput without hardware replacements. Customers may start with a certain bandwidth requirement to meet their current business needs, and later on, when the business grows, scale without a forklift upgrade. Customers can upgrade from as little as 200 Mbps all the way to 4 Gbps and from 8 Gbps all the way to 20 Gbps by using the same hardware platform. As a result, you can meet all your business growth needs, improve uptime and meet SLA for your mission critical applications. Consequently, not only are business requirements met, but it is accomplished with a simple license upgrade.

Armed with Radware's APSolute OS "application aware" functionality, OnDemand Switch offers the broadest functionality in the application delivery market. You can add additional, advanced services by simply applying a new license. The APSolute OS service architecture extends:

- Health monitoring and traffic redirection capabilities for real-time identification of service failures
- Load balancing for optimized management of traffic flows across the enterprise
- Bandwidth management for policy-driven service prioritization
- Application acceleration for offloading servers and optimizing content delivery through SSL offloading, TCP multiplexing, compression and caching
- Intrusion prevention and DoS protection to safeguard networks and resources
- Application performance monitoring to analyze real-time traffic and pinpoint performance degradations.

OnDemand Switch delivers a wide range of APSolute advanced services addressing data-centers' most prominent challenges, with no compromise on performance.

On Demand Investment Protection

OnDemand Switch provides seamless scalability during on-going IT operations. Typically, scaling up an infrastructure implies hardware replacements. No more. OnDemand Switch provides a hassle-free upgrade with no downtime, eliminating large-scale upgrade projects that are required every time you max out the capacity of your switches. OnDemand Switch eliminates the need to design, test, stage, install and debug a new hardware device, thus significantly reducing the high costs and time typically associated with scaling your environment. Thanks to its throughput and services scalability, OnDemand Switch dramatically extends the life-time of the hardware platform. By leveraging the extendable throughput license, your infrastructure investment is protected as you pay only for the performance you need today and easily scale when you need more. As a result, there is also no need to pay up front for future capacity needs. This provides you with superior cost effectiveness and lowers your overall total cost of ownership (TCO).

On Demand Operations Simplicity

OnDemand Switch reduces data center operations complexity and related costs thanks to its hassle-free scalability, outstanding reliability and standard, unified platform that is suitable for all throughput levels. Therefore, the entire operational environment can be standardized on one type of switching platform resulting in more efficient operational processes. This also generates significant savings in terms of training and the inventory carried for spare and backup devices.

Additional Benefits

Carrier-Grade Reliability

OnDemand Switch delivers carrier-grade reliability and performance required by the most demanding carrier application environments. It features a reliable, custom-made hardware coupled with embedded components providing high MTBF. OnDemand Switch is NEBS ready and it also complies with the strictest regulations and is certified by the most up-to-date hardware standards. In addition, OnDemand Switch provides dependable, dual AC/DC power supply.

Guaranteed Availability & Secured Management

OnDemand Switch provides continuous guaranteed availability of remote management even under extreme utilization conditions. As the two redundant management ports use a separate, out-of-band management data path, the management traffic is not affected by the data traffic. For enhanced security, the management ports are isolated from the traffic ports. Moreover, the management ports can work in a redundant mode for high availability.

Enhanced Configuration

OnDemand Switch allows for easy installation, recovery and upgrade of its software as well as configuration back-up for enhanced management. It also features a convenient LCD Panel for display of key performance statistics.

On Demand Innovation

OnDemand Switch Layer 4-7 operations are powered by a state-of-the-art hardware architecture for optimized resource utilization, maximum application performance, top reliability and superior manageability.

The E.U.T. was tested with power supply M/N MRW-5500V4V, manufactured by ZIPPY.

The E.U.T. includes the following changes:

PCB layout changes in motherboard and 4SFP daughter board.

6. List of Test Equipment

6.1 Emission Tests

The equipment indicated below by an "X" was used for testing Conducted Emission (**CE**) and Radiated Emission (**RE**)

Test equipment calibration is in accordance with ITL Q.A. Procedure PM 110 "Calibration Control Procedure", which complies with ISO 9002 and ISO/IEC Guide 17025.

Instrument	Manufacturer	Model	Serial No.	Used in Test	
				CE	RE
ISN	T3SEQ	ISN T8-Cat 6	28749		
LISN	EMCO	3810/2BR	9601-1297	X	
Transient Limiter	HP	11947A	3107A03041	X	
RF Amplifier	HP	8447F	3113A06386		X
RF Amplifier	HP	83006A	3104A00589		X
RF Amplifier	MITEQ	50-8P	AFSX4		X
Current Probe	FCC	F51	163	X	
EMI Receiver	HP	8546A	3650A00365	X	X
Receiver RF Filter Section	HP	85460A	3650A00365	X	X
EMC Analyzer	HP	HP8593	3536A00120		X
Biconilog Antenna	EMCO	3142B	1250		X
Horn Antenna	ETS	3115	6142		X
Antenna Mast	ETS	2070-2	ETS		X
Turntable	ETS	2087	ETS		X
Mast & Table Controller	ETS/EMCO	2090	ETS/EMCO		X

7. E.U.T. Performance Verification

7.1 Mode of Operation

The E.U.T. was operated by running a test software application.
The E.U.T. sends data frames between the ports. The frames are been sent from:
Giga copper Port G1 to Giga Port G2, Giga copper Port G3 to Giga Port G4,
Giga copper Port G5 to Giga Port G6, Giga copper Port G7 to Giga Port G8,
Giga copper MNG1 to Giga Port MNG2.

The GBIC ports were connected by fiber cross cable in the following configurations:
SFP Port G9 to SFP Port G10.
SFP Port G11 to SFP Port G12.
XFP Port XG1 to XFP Port XG2
XFP Port XG3 to XFP Port XG4

If the data frames received after the complete loop between ports G1 and XG4,
on the screen of the auxiliary laptop, the following message appears for all ports at the end of the defined test cycle (1min): PASSED

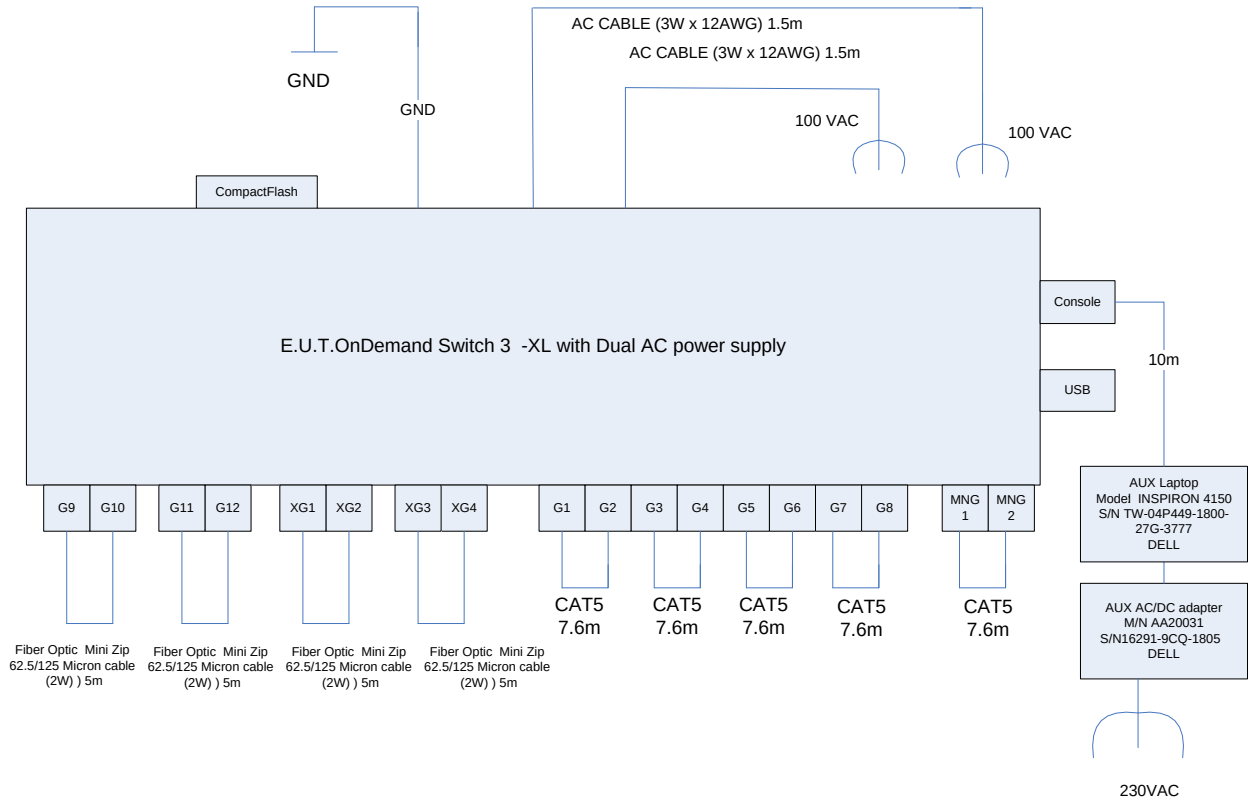

Figure 1. Test Set-up

8. Conducted Emission From AC Mains

8.1 Test Specification

0.15-30 MHz, CISPR 22 Edition 5.2: 2006, CLASS A

8.2 Test Procedure

The E.U.T operation mode and test setup are as described in Section 7.1. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room (see Section 3), with the E.U.T placed on a 0.4 meter high wooden table. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The E.U.T was powered from 100 V AC / 50 Hz via 50 Ohm / 50 µHn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T.'s AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 13. Conducted Emission From AC Mains Test*.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak detector and average.

8.3 Test Results

The E.U.T complies with the CISPR 22 Edition 5.2: 2006, Class A specification requirements.

The margin between the emission levels and the specification limit is, in the worst case, 19.5 dB for the phase line at 0.20 MHz and 16.5 dB at 0.20 MHz for the neutral line.

The details of the highest emissions are given in *Figure 2* to *Figure 5*.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Phase
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)
1	0.203625	54.4	51.0	-28.0	46.5	-19.5
2	0.274404	50.9	49.6	-29.4	44.8	-21.2
3	0.344679	48.9	46.4	-32.6	41.5	-24.5
4	0.412766	47.0	45.8	-33.2	41.8	-24.2
5	0.480574	43.7	41.8	-37.2	37.2	-28.8
6	0.504500	36.4	35.1	-37.9	34.0	-26.0
7	0.549610	40.0	37.7	-35.3	33.4	-26.6

Figure 2. Conducted Emission: PHASE

Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Phase
Detectors: Peak, Quasi-peak, Average

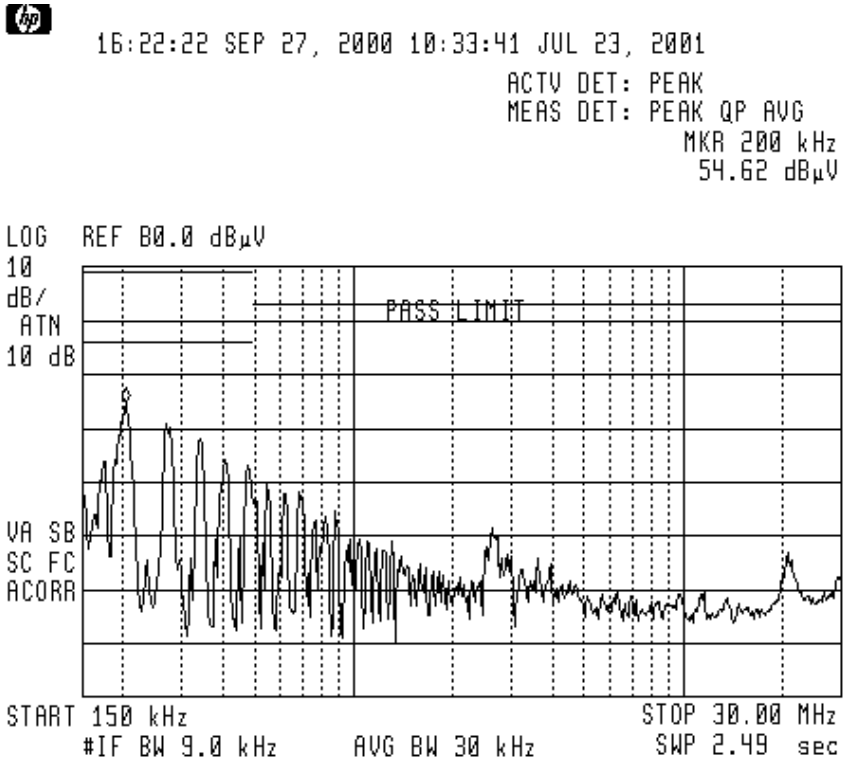

Figure 3 PHASE
Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Neutral
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuV)	QP (dBuV)	QP Delta L 1 (dB)	Avg (dBuV)	Av Delta L 2 (dB)
1	0.203625	56.9	53.7	-25.3	49.5	-16.5
2	0.274404	52.0	50.7	-28.3	45.8	-20.2
3	0.344679	50.2	47.7	-31.3	42.8	-23.2
4	0.412766	48.3	47.0	-32.0	43.0	-23.0
5	0.480574	44.9	43.0	-36.0	38.5	-27.5
6	0.504500	39.0	37.9	-35.1	36.7	-23.3
7	0.549610	41.2	38.9	-34.1	34.8	-25.2

Figure 4. Conducted Emission: Neutral

Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Neutral
Detectors: Peak, Quasi-peak, Average

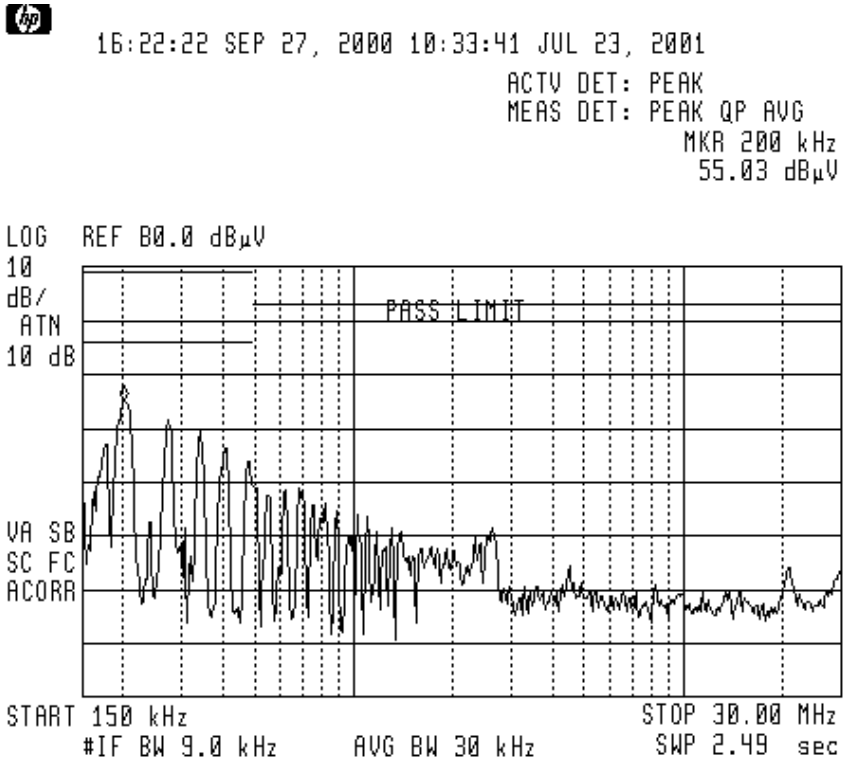

Figure 5 NEUTRAL
Detectors: Peak, Quasi-peak, Average

9. Conducted Emission From Telecommunication Ports

9.1 Test Specification

0.15-30 MHz, CISPR 22 Edition 5.2: 2006, CLASS A

9.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 7.1. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room (see Section 3), with the E.U.T (table-top) placed on a 0.4 meter high wooden table. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The emissions on the telecommunication lines were measured using the method of CISPR 22: 2005 Annex C (ISN Method).

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 14. Conducted Emission From Telecommunication Ports Test*.

The output voltages of the ISN were measured using a computerized receiver, complying to CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

9.3 Test Results

The E.U.T met the requirements of the CISPR 22 Edition 5.2: 2006, Class A specification.

The margin between the emission levels and the specification limit is, in the worst case, 22.2 dB at 4.56 MHz for the SFP 1 Port.

The margin between the emission levels and the specification limit is, in the worst case, 33.3 dB at 0.17 MHz for the LAN 1 Port.

The margin between the emission levels and the specification limit is, in the worst case, 18.4 dB at 0.49 MHz for the Management Port.

The details of the highest emissions are given in *Figure 6* to *Figure 11*.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: SFP1 Port
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuA)	QP (dBuA)	QP Delta L 1 (dB)	Avg (dBuA)	Av Delta L 2 (dB)
1	3.928519	15.2	9.7	-33.3	5.1	-24.9
2	3.988424	14.6	8.6	-34.4	2.5	-27.5
3	4.528539	13.2	10.1	-32.8	7.8	-22.2
4	4.651009	11.6	8.2	-34.8	5.8	-24.2
5	5.685330	10.9	5.5	-37.5	-0.7	-30.7
6	6.979227	10.6	8.1	-34.9	6.2	-23.8

Figure 6. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification:	CISPR 22 Edition 5.2: 2006, Class **A**
Lead:	SFP1 Port
Detectors:	Peak, Quasi-peak, Average

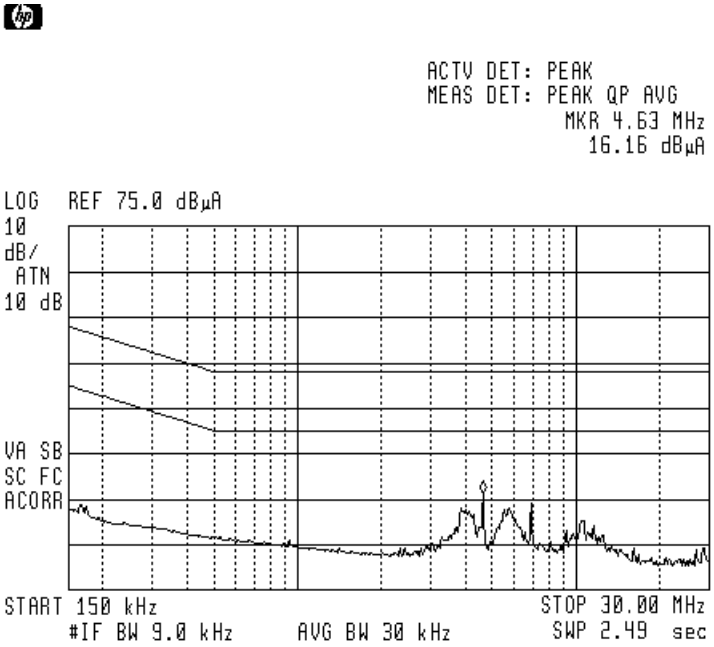

Figure 7. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: LAN 1 Port
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuA)	QP (dBuA)	QP Delta L 1 (dB)	Avg (dBuA)	Av Delta L 2 (dB)
1	0.169173	14.3	12.0	-40.0	5.8	-33.3
2	0.336375	4.4	1.7	-44.6	-5.6	-38.9
3	3.403080	2.2	-3.3	-46.3	-9.7	-39.7
4	9.296750	3.1	-1.4	-44.4	-7.9	-37.9
5	12.084825	-0.3	-5.8	-48.8	-12.1	-42.1
6	26.171680	-1.9	-6.9	-49.9	-13.2	-43.2
7	28.520730	-4.3	-9.3	-52.3	-15.5	-45.5

Figure 8. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: LAN 1 Port
Detectors: Peak, Quasi-peak, Average

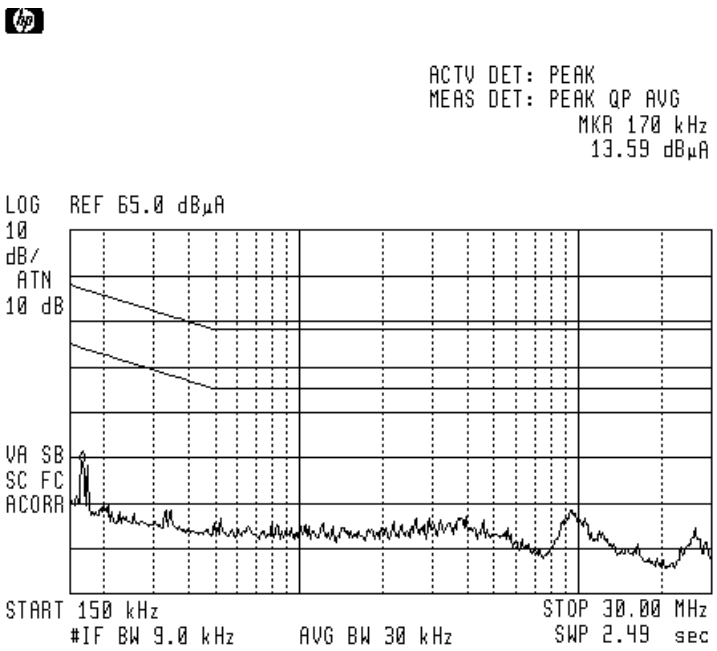

Figure 9. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Management Port
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuA)	QP (dBuA)	QP Delta L 1 (dB)	Avg (dBuA)	Av Delta L 2 (dB)
1	0.246765	10.9	9.1	-39.7	8.4	-27.5
2	0.494865	12.9	11.9	-31.1	11.7	-18.4
3	0.742665	12.6	11.6	-31.4	11.4	-18.5
4	0.990898	7.7	6.1	-36.9	5.4	-24.6
5	1.238863	12.3	11.0	-32.0	10.6	-19.4
6	1.486063	10.3	9.2	-33.8	8.6	-21.4
7	1.733030	4.6	3.2	-39.8	2.7	-27.3

Figure 10. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Management Port
Detectors: Peak, Quasi-peak, Average

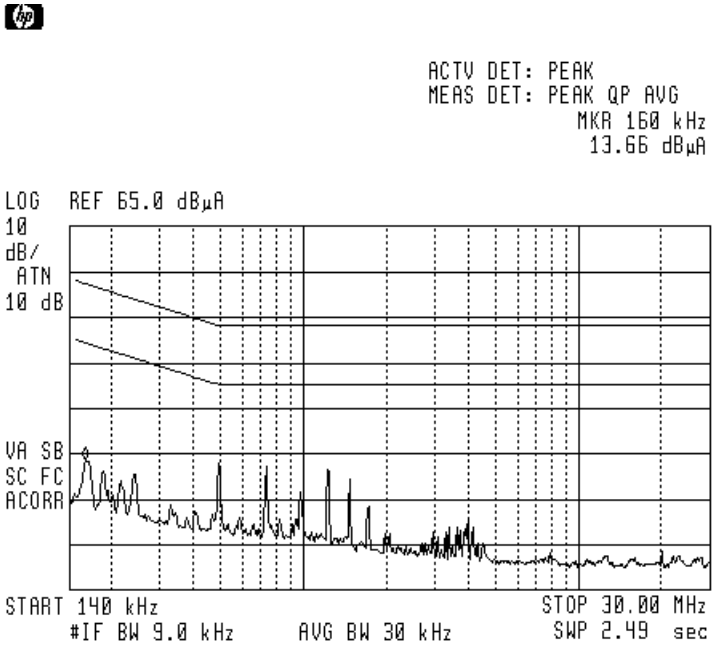

Figure 11. Detectors: Peak, Quasi-peak, Average

10. Radiated Emission

10.1 Test Specification

30-6000 MHz, CISPR 22 Edition 5.2: 2006, CLASS A

10.2 Test Procedure

The E.U.T operation mode and test set-up are as described in section 7.1.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 15. Radiated Emission Test*.

The E.U.T. highest frequency source or used frequency is 2.5 GHz.

The frequency range 30-6000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

Turning the E.U.T on and off.
Using a frequency span less than 10 MHz.
Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The emissions were measured at a distance of 3 meters on the OATS.

In the frequency range 1.0 - 6 GHz, a computerized EMI receiver complying to CISPR 16 requirements was used. During peak measurements, the I.F. bandwidth was 1 MHz, and video bandwidth 3 MHz. During average measurements, the I.F. bandwidth was 1 MHz and video bandwidth was 100 Hz.

The readings were maximized by adjusting the turntable azimuth between 0-360°, and the antenna polarization.
Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The emissions were measured at a distance of 3 meters inside the anechoic chamber.

10.3 Test Results

The E.U.T met the requirements of the CISPR 22 Edition 5.2: 2006, Class A specification requirements.

The margin between the emission level and the specification limit is 8.6 dB in the worst case at the frequency of 84.04 MHz, horizontal polarization.

The details of the highest emissions are given in *Figure 12*.

Radiated Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W AC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006,Class A

Antenna Polarization: Horizontal/Vertical
Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
Detectors: Peak, Quasi-peak

Frequency	Peak Amp	QP Amp	Antenna Polarization:		Limit	Margin
(MHz)	dBµV/m	dBµV/m	Hor.	Ver.	dBµV/m	(dB)
84.04		41.9	X		50.5	-8.6
54.72		31.0	X		50.5	-19.5
147.09		38.9	X		50.5	-11.6
125.00		33.3	X		50.5	-17.2
250.00		40.1	X		57.5	-17.4
500.04		42.6	X		57.5	-14.9
700.00		36.5	X		57.5	-21.0
51.04		38.5		X	50.5	-12.0
48.82		38.3		X	50.5	-12.2
55.06		38.9		X	50.5	-11.6
56.87		38.6		X	50.5	-11.9
125.00		38.1		X	50.5	-12.4
250.00		42.8		X	57.5	-14.7

Figure 12. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL Detectors: Peak, Quasi-peak

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

11. Set Up Photographs

Figure 13. Conducted Emission From AC Mains Test

Figure 14. Conducted Emission From Telecommunication Ports Test

Figure 15. Radiated Emission Test

12. Signatures of the E.U.T's Test Engineers

Test	Test Engineer Name	Signature	Date
Conducted Emissions	Y. Mordukhovitch		29.12.11
Conducted Emissions From Telecommunication Ports	Y. Mordukhovitch		29.12.11
Radiated Emissions	Y. Mordukhovitch		29.12.11

13. APPENDIX A - CORRECTION FACTORS

13.1 Correction factors for CABLE

from EMI receiver
to test antenna
at 3 AND 10 meter range.

FREQUENCY	CORRECTION FACTOR		FREQUENCY	CORRECTION FACTOR
(MHz)	(dB)		(MHz)	(dB)
30	1.96		700	11.25
35	2.08		800	12.53
40	2.26		900	13.86
45	2.43		1000	14.86
50	2.59		1200	15.7
55	2.65		1400	17.05
60	2.86		1600	18.2
65	2.96		1800	19.4
70	3.04		2000	21.3
75	3.27			
80	3.41			
85	3.54			
90	3.68			
95	3.77			
100	3.93			
110	4.19			
120	4.41			
130	4.6			
140	4.83			
150	5.06			
160	5.35			
170	5.57			
180	5.7			
190	5.84			
200	6.02			
250	6.86			
300	7.59			
350	8.09			
400	8.7			
450	9.15			
500	9.53			
550	9.82			
600	10.24			
650	10.74			

NOTES:

1. The cable type is **RG-214/U**

13.2 Correction factors for CABLE 1-6 GHz

from EMI receiver to test antenna at 3 range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
30	0.7	500	3.4
35	0.8	550	3.4
40	0.9	600	3.7
45	0.9	650	3.8
50	1	700	4
55	1	800	4.3
60	1.1	900	4.5
65	1.2	1000	4.8
70	1.1	1500	6.1
75	1.3	2000	6.4
80	1.3	2500	8.5
90	1.3	3000	8.8
100	1.5	3500	9
110	1.5	4000	10.8
120	1.6	4500	11.6
130	1.7	5000	12.2
140	1.7	5500	12.8
150	1.8	6000	13
160	1.8	6500	13.4
170	2	7000	14.1
180	2	7500	13.8
190	1.9	8000	14.6
200	2.1	8500	16.9
250	2.3	9000	16.5
300	2.6	9500	19.4
350	2.8	10000	19.8
400	2.9	10500	20.2
450	3.2	13000	20.6

13.3 Correction factors for Amplifier 8447F 30M-1.3G GAIN

FREQUENCY (MHz)	GAIN (dB)
20	27.16
30	27.18
50	27.15
100	27.01
200	26.48
500	27.54
1000	26.96
1100	26.69
1200	26.28
1300	25.85

13.4 Correction factors for Amplifiers 83006A and 50-8P

FREQUENCY (GHz)	GAIN (dB)
1.0	49.3
2.0	51.5
3.0	52.7
4.0	53.8
5.0	51.7
6.0	51.8
7.0	50.1
8.0	47.4
9.0	47.3
10.0	46.2
11.0	47.6
12.0	47.1
13.0	48.4

13.5 Correction factors for Bilog ANTENNA

Model: 3142
Antenna serial number: 1250
3 meter range

FREQUENCY (MHz)	AFE (dB/m)	FREQUENCY (MHz)	AFE (dB/m)
30	18.4	1100	25
40	13.7	1200	24.9
50	9.9	1300	26
60	8.1	1400	26.1
70	7.4	1500	27.1
80	7.2	1600	27.2
90	7.5	1700	28.3
100	8.5	1800	28.1
120	7.8	1900	28.5
140	8.5	2000	28.9
160	10.8		
180	10.4		
200	10.5		
250	12.7		
300	14.3		
400	17		
500	18.6		
600	19.6		
700	21.1		
800	21.4		
900	23.5		
1000	24.3		

13.6 Correction factors for Horn ANTENNA

Model: 3115
Antenna serial number: 6142
3 meter range

FREQUENCY (MHz)	Antenna Factor (dB/m)	FREQUENCY (MHz)	Antenna Factor (dB/m)
1000	23.9	10500	38.4
1500	25.4	11000	38.5
2000	27.3	11500	39.4
2500	28.5	12000	39.2
3000	30.4	12500	39.4
3500	31.6	13000	40.7
4000	33	14000	42.1
4500	32.7	15000	40.1
5000	34.1	16000	38.2
5500	34.5	17000	41.7
6000	34.9	17500	45.7
6500	35.1	18000	47.7
7000	35.9		
7500	37.5		
8000	37.6		
8500	38.3		
9000	38.5		
9500	38.1		
10000	38.6		

14. APPENDIX B - MEASUREMENT UNCERTAINTY

14.1 Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 4.96 dB

14.2 Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) 0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 3.44 dB

15. Appendix C – VCCI Labeling Instructions

15.1 Labeling Instructions

The Regular Member shall put the following statement on a Class A ITE or Class B ITE, as reported.

1. **Class A ITE**

A Class A ITE shall have the following message in a visible location on each product. If direct marking is difficult, a tag can be used.

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

Translation:

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 corrective actions.

Note 1: The characters shall not be less than 2 mm high. If adequate space is unavailable, the character size may be reduced as long as the characters are readable.

Note 2: VCCI-A means that the equipment satisfies the limits of interference for Class A ITE.

Note 3: The above statement **must** be printed in J**apanese**.

2. **Class B ITE**

A Class B ITE shall have the following label in a visible location on each product:

15.2 Statements for User Manual

For Class A ITE or Class B ITE ,a Regular Member shall supply one of the following messages in instruction manuals:

For ITE that is reported based on the result of measuring at the user's installation site, the Regular Member shall add the message shown in clause 3 to the contents of the instruction manual already supplied to the user.

1. **Class A ITE**

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラス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。

Translation:
This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI).If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

2. **Class B ITE**

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。 取扱説明書に従って正しい取り扱いをして下さい。

Translation:
This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI).If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

Note: The above statements **must** be printed in **Japanese.**

ISRAEL TESTING LABORATORIES
Global Certifications You Can Trust

ACCREDITED
TESTING Cert No.1152.01

DATE: 25 December 2011

I.T.L. (PRODUCT TESTING) LTD.

VCCI EMC Test Report

for

RADWARE Ltd.

Equipment under test:

Network Switch

ODS3-XL With Redundant 500W DC Power Supply*

* See customer's declaration on page 4.

Written by: _____
D. Shidlowsky, Documentation

Approved by: _____
Y. Mordukhovitch, Test Engineer

Approved by: _____
I. Raz, EMC Laboratory Manager

TABLE OF CONTENTS

1. General Information

1.1 Administrative Information

Manufacturer:	RADWARE Ltd.
Manufacturer's Address:	22 Raul Wallenberg St. Tel-Aviv Israel 61131 Tel: +972-3-766-8900 Fax: +972-3-766-8922
Manufacturer's Representative:	Yaniv Ben-Dor
Equipment Under Test (E.U.T):	Network Switch
Equipment Model No.:	ODS3-XL With Redundant 500W DC Power Supply (See customer's declaration on following page).
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	30.10.2011
Start of Test:	30.10.2011
End of Test:	31.10.2011
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 71100
Test Specifications:	See Section 2

radware

July 4th , 2010

Declaration of Similarity

I HEREBY DECLARE THAT THE FOLLOWING PRODUCTS:

RODS3-DEFDUDC-ND
RODS3XL-DEFDUDC
RODS3-ALT2DC
RODS3-NEBS
RODS3XL-ALT2DC
RODS3XL-NEBS
RODS3XL-S1-2DC
RODS3XL-S2N-2DC
ODS3 v. 2 DC
LinkProof DC
AppDirector DC
AppDirector XL DC
AppWall DC
AppXcel DC
AppXML DC
SIP Director DC
Alteon 5412 DC
Alteon 5412 XL DC
InFlight DC
Virtual Director DC
APSolute Vision DC
DefensePro DC
Content Inspection Director (CID) DC
OnDemand Switch 3 v.2 DC
OnDemand Switch 3 XL DC

ARE IDENTICAL ELECTRONICALLY, PHYSICALLY, AND MECHANICALLY TO:

ODS3 -XL DC

Please relate to them all (from an EMC & safety point of view) as the same product.

Thank You,

Yaniv Ben-Dor
Engineering Manager
Radware Ltd.

Legal Signature

RADWARE Ltd.
22 Raoul Wallenberg
Tel-Aviv 69710
ISRAEL

1.2 Abbreviations and Symbols

The following abbreviations and symbols are applicable to this test report:

A/m	ampere per meter
AC	alternating current
AM	amplitude modulation
ARA	Antenna Research Associates
Aux	auxiliary
Avg	average
CDN	coupling-decoupling network
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dbµV	decibel referred to one microvolt
dbµV/m	decibel referred to one microvolt per meter
DC	direct current
EFT/B	electrical fast transient/burst
EMC	electromagnetic compatibility
ESD	electrostatic discharge
E.U.T.	equipment under test
GHz	gigahertz
HP	Hewlett Packard
Hz	Hertz
kHz	kilohertz
kV	kilovolt
LED	light emitting diode
LISN	line impedance stabilization network
m	meter
mHn	millihenry
MHz	megahertz
msec	millisecond
N/A	not applicable
per	period
QP	quasi-peak
PC	personal computer
RF	radio frequency
RE	radiated emission
sec	second
V	volt
V/m	volt per meter
VRMS	volts root mean square

1.3 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 861911.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-3006, R-2729, T-1877, G-245.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025A-1.
6. TUV Product Services, England, ASLLAS No. 97201.

I.T.L. Product Testing Ltd. is accredited by the American association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

2. Applicable Documents

2.1	**CISPR 22 Edition 5.2: 2006**	*Limits and Methods Measurement of Radio Disturbance Characteristics of the Information Technology Equipment.*
2.2	**VCCI: 2010**	*Agreement of Voluntary Control Council for Interference by Information Technology*

3. Test Site Description

3.1 Location:

The Electromagnetic Compatibility Test Facility of I.T.L. (Product testing) Ltd. Is located at
Telrad Industrial Park, Lod, 71100 Israel.
Telephone: +972-8-9153100
Fax: +972-8-9153101

3.2 Open Site:

The OATS is located on a one floor-building roof. The OATS consists of 3 meter and 10 meter ranges, using a 21.5m X 8.5m solid metal ground plane, a remote controlled turntable and an antenna mast.

3.3 Ground Plane:

The ground plane is made from steel plates, which are welded continuously together. The Ground plane is lies and welded on welded steel construction with vias to allow for water drainage.
All the power, control, and signal lines to the turntable and the 3 m and 10m antenna mast outlets are routed in shielded conduits under the plane to the control building.

3.4 Antenna Mast:

ETS model 2070-2. The antenna position and polarization are remote controlled via Fiber Optical Link using ETS/EMCO Dual Controller Type 2090. The antenna position is adjustable between 1-4 meters. Pressurized air is used to power changing the polarity of the antenna.

3.5 Turntable:

ETS model 2087 series. The position of the turntable is remote-controlled via Fiber Optic Link, using ETS/EMCO Dual Controller Type 2090. The turntable is mounted in a pit and its surface is flush with the Open Site Ground Plane. Brushes near the periphery of the turntable ensure good conductive connection to the ground plane. The Turntable maximum load is 1250 Kg.

3.6 EMI Receiver:

Type HP8542E, including HP85420E R.F. filter manufactured by Hewlett-Packard, being in full compliance with CISPR 16 requirements.

3.7 E.U.T. Support:

Table mounted E.U.T.s are supported during testing on 80 cm high all-wooden tables (no metal nails or screws).

3.8 Test Equipment:

See details in Section 6.

3.9 VCCI Registration

VCCI Registration Numbers: C-3006, R-2729, T-1877, G-245

4. Summary of Test Results

Test	Results
Conducted Emissions From Telecommunication Ports CISPR 22 Edition 5.2: 2006, Class A	The E.U.T met the performance requirements of the specification. The margin between the emission levels and the specification limit was, in the worst case, 1.5 dB for the Management Port at 0.74 MHz. The margin between the emission levels and the specification limit was, in the worst case, 15.5 dB for the LAN Port at 1.49 MHz. The margin between the emission levels and the specification limit was, in the worst case, 21.5 dB for the SFP Port at 9.30 MHz.
Radiated Emissions CISPR 22 Edition 5.2: 2006, Class A	The E.U.T met the performance requirements of the specification. The margin between the emission level and the specification limit was 6.1 dB in the worst case at the frequency of 44.64 MHz, vertical polarization.

5. Equipment Under Test (E.U.T.) Description

OnDemand Switch™, Radware's next-generation hardware platform, delivers the breakthrough performance and superior scalability needed to effectively meet contemporary network and business needs. Specifically designed for the majority of enterprises and carriers that operate in dynamic, ever-changing environments and face diverse requirements, OnDemand Switch provides the extendable throughput they need from 0-20 Gbps for unparalleled scalability, business availability and performance. With OnDemand Switch you can add additional application-aware services on demand to meet new or changing application and infrastructure requirements without a compromise on performance. And, thanks to its one-click service and throughput upgrade capabilities, OnDemand Switch delivers both short-term and long-term savings on CAPEX and OPEX for full investment protection. OnDemand Switch represents a paradigm shift in the application delivery marketplace by providing customers with a new, cost effective and hassle-free upgrade standard.

On Demand Performance at All Throughput Requirements

As data-center complexity increases in terms of servers, applications, technologies and capacity, and there are clear requirements from the network to be more application-aware and add more application intelligence and services, application delivery solutions need to meet these growing requirements with more sophisticated, powerful switching capabilities. OnDemand Switch delivers unmatched performance up to 20 Gbps of throughput. Thanks to its revolutionary, rock-solid architecture, OnDemand Switch provides the best application delivery performance at all throughput levels to support all layer 4-7 network requirements. Whenever your network faces heavier traffic loads and you business require higher throughput levels, OnDemand Switch still provides the best performance at all times.

On Demand Throughput and Service Scalability

OnDemand Switch meets business growth demand by enabling customers to scale up performance by increasing throughput without hardware replacements. Customers may start with a certain bandwidth requirement to meet their current business needs, and later on, when the business grows, scale without a forklift upgrade. Customers can upgrade from as little as 200 Mbps all the way to 4 Gbps and from 8 Gbps all the way to 20 Gbps by using the same hardware platform. As a result, you can meet all your business growth needs, improve uptime and meet SLA for your mission critical applications. Consequently, not only are business requirements met, but it is accomplished with a simple license upgrade.

Armed with Radware's APSolute OS "application aware" functionality, OnDemand Switch offers the broadest functionality in the application delivery market. You can add additional, advanced services by simply applying a new license. The APSolute OS service architecture extends:

- Health monitoring and traffic redirection capabilities for real-time identification of service failures
- Load balancing for optimized management of traffic flows across the enterprise
- Bandwidth management for policy-driven service prioritization
- Application acceleration for offloading servers and optimizing content delivery through SSL offloading, TCP multiplexing, compression and caching
- Intrusion prevention and DoS protection to safeguard networks and resources
- Application performance monitoring to analyze real-time traffic and pinpoint performance degradations.

OnDemand Switch delivers a wide range of APSolute advanced services addressing data-centers' most prominent challenges, with no compromise on performance.

On Demand Investment Protection

OnDemand Switch provides seamless scalability during on-going IT operations. Typically, scaling up an infrastructure implies hardware replacements. No more. OnDemand Switch provides a hassle-free upgrade with no downtime, eliminating large-scale upgrade projects that are required every time you max out the capacity of your switches. OnDemand Switch eliminates the need to design, test, stage, install and debug a new hardware device, thus significantly reducing the high costs and time typically associated with scaling your environment. Thanks to its throughput and services scalability, OnDemand Switch dramatically extends the life-time of the hardware platform. By leveraging the extendable throughput license, your infrastructure investment is protected as you pay only for the performance you need today and easily scale when you need more. As a result, there is also no need to pay up front for future capacity needs. This provides you with superior cost effectiveness and lowers your overall total cost of ownership (TCO).

On Demand Operations Simplicity

OnDemand Switch reduces data center operations complexity and related costs thanks to its hassle-free scalability, outstanding reliability and standard, unified platform that is suitable for all throughput levels. Therefore, the entire operational environment can be standardized on one type of switching platform resulting in more efficient operational processes. This also generates significant savings in terms of training and the inventory carried for spare and backup devices.

Additional Benefits

Carrier-Grade Reliability

OnDemand Switch delivers carrier-grade reliability and performance required by the most demanding carrier application environments. It features a reliable, custom-made hardware coupled with embedded components providing high MTBF. OnDemand Switch is NEBS ready and it also complies with the strictest regulations and is certified by the most up-to-date hardware standards. In addition, OnDemand Switch provides dependable, dual AC/DC power supply.

Guaranteed Availability & Secured Management

OnDemand Switch provides continuous guaranteed availability of remote management even under extreme utilization conditions. As the two redundant management ports use a separate, out-of-band management data path, the management traffic is not affected by the data traffic. For enhanced security, the management ports are isolated from the traffic ports. Moreover, the management ports can work in a redundant mode for high availability.

Enhanced Configuration

OnDemand Switch allows for easy installation, recovery and upgrade of its software as well as configuration back-up for enhanced management. It also features a convenient LCD Panel for display of key performance statistics.

On Demand Innovation

OnDemand Switch Layer 4-7 operations are powered by a state-of-the-art hardware architecture for optimized resource utilization, maximum application performance, top reliability and superior manageability.

The E.U.T. was tested with power supply M/N DMRW-5500V4V, manufactured by ZIPPY.

The E.U.T. includes the following changes:

PCB layout changes in motherboard and 4SFP daughter board.

6. List of Test Equipment

6.1 Emission Tests

The equipment indicated below by an "X" was used for testing Conducted Emission (**CE**) and Radiated Emission (**RE**)

Test equipment calibration is in accordance with ITL Q.A. Procedure PM 110 "Calibration Control Procedure", which complies with ISO 9002 and ISO/IEC Guide 17025.

Instrument	Manufacturer	Model	Serial No.	Used in Test	
				CE	RE
ISN	T3SEQ	ISN T8-Cat 6	28749		
LISN	EMCO	3810/2BR	9601-1297	X	
Transient Limiter	HP	11947A	3107A03041	X	
RF Amplifier	HP	8447F	3113A06386		X
RF Amplifier	HP	83006A	3104A00589		X
RF Amplifier	MITEQ	50-8P	AFSX4		X
Current Probe	FCC	F51	163	X	
EMI Receiver	HP	8546A	3650A00365	X	X
Receiver RF Filter Section	HP	85460A	3650A00365	X	X
EMC Analyzer	HP	HP8593	3536A00120		X
Biconilog Antenna	EMCO	3142B	1250		X
Horn Antenna	ETS	3115	6142		X
Antenna Mast	ETS	2070-2	ETS		X
Turntable	ETS	2087	ETS		X
Mast & Table Controller	ETS/EMCO	2090	ETS/EMCO		X

7. E.U.T. Performance Verification

7.1 Mode of Operation

The E.U.T. was operated by running a test software application.
The E.U.T. sends data frames between the ports. The frames are been sent from:
Giga copper Port G1 to Giga Port G2, Giga copper Port G3 to Giga Port G4,
Giga copper Port G5 to Giga Port G6, Giga copper Port G7 to Giga Port G8,
Giga copper MNG1 to Giga Port MNG2.

The GBIC ports were connected by fiber cross cable in the following configurations:
SFP Port G9 to SFP Port G10.
SFP Port G11 to SFP Port G12.
XFP Port XG1 to XFP Port XG2
XFP Port XG3 to XFP Port XG4

If the data frames received after the complete loop between ports G1 and XG4,
on the screen of the auxiliary laptop, the following message appears for all ports at the end of the defined test cycle (1min): PASSED

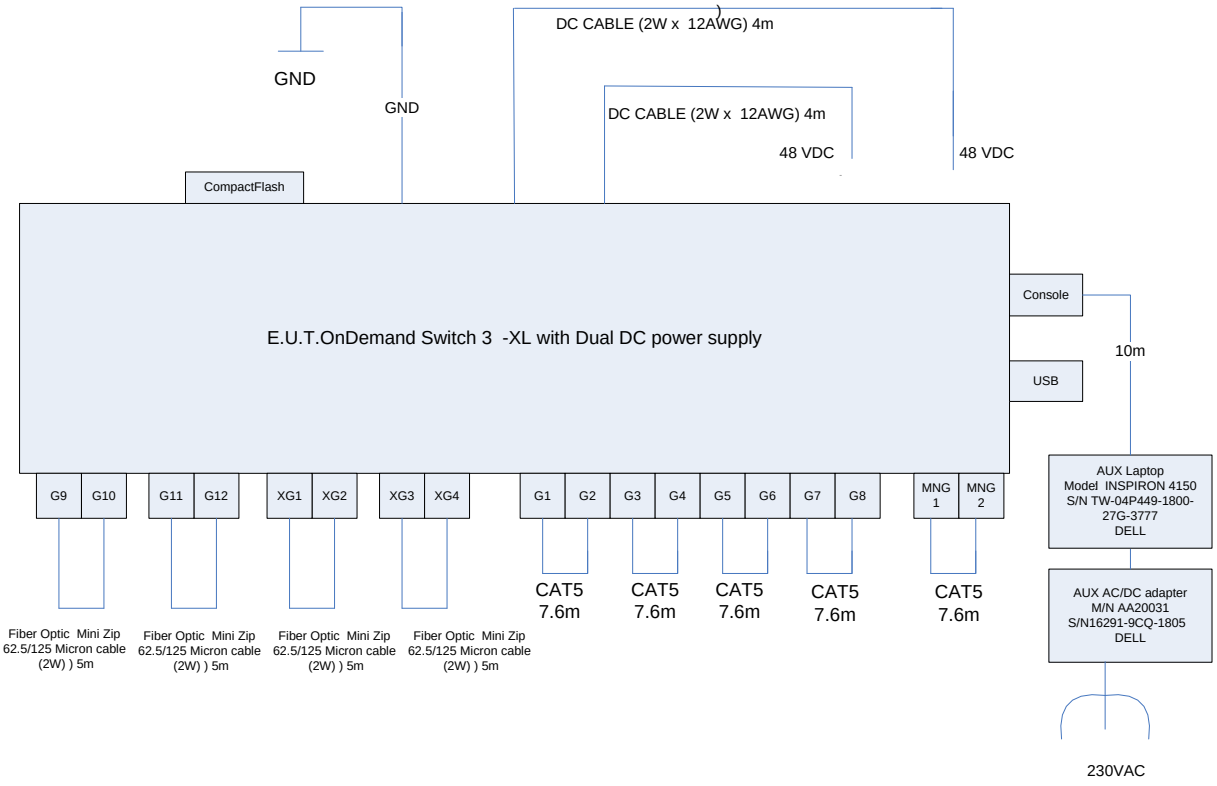

Figure 1. Test Set-up

8. Conducted Emission From Telecommunication Ports

8.1 Test Specification

0.15-30 MHz, CISPR 22 Edition 5.2: 2006, CLASS A

8.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 7.1. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room (see Section 3), with the E.U.T (table-top) placed on a 0.4 meter high wooden table. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The emissions on the telecommunication lines were measured using the method of CISPR 22: 2005 Annex C (ISN Method).

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 10. Conducted Emission From Telecommunication Ports Test*.

The output voltages of the ISN were measured using a computerized receiver, complying to CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

8.3 Test Results

The E.U.T met the requirements of the CISPR 22 Edition 5.2: 2006, Class A specification.

The margin between the emission levels and the specification limit is, in the worst case, 1.5 dB at 0.74 MHz for the Management Port.

The margin between the emission levels and the specification limit is, in the worst case, 15.5 dB at 1.49 MHz for the LAN Port.

The margin between the emission levels and the specification limit is, in the worst case, 21.5 dB at 9.30 MHz for the SFP Port.

The details of the highest emissions are given in *Figure 2* to *Figure 5*.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Management Port
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuA)	QP (dBuA)	QP Delta L 1 (dB)	Avg (dBuA)	Av Delta L 2 (dB)
1	0.495039	27.7	27.4	-15.6	27.5	-2.6
2	0.742913	29.1	28.6	-14.4	28.5	-1.5
3	0.990596	24.1	23.7	-19.3	23.6	-6.4
4	1.237372	29.9	28.8	-14.2	28.3	-1.7
5	1.485133	27.3	26.8	-16.2	26.1	-3.9
6	1.733117	21.0	20.6	-22.4	20.5	-9.5

Figure 2. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: Management Port
Detectors: Peak, Quasi-peak, Average

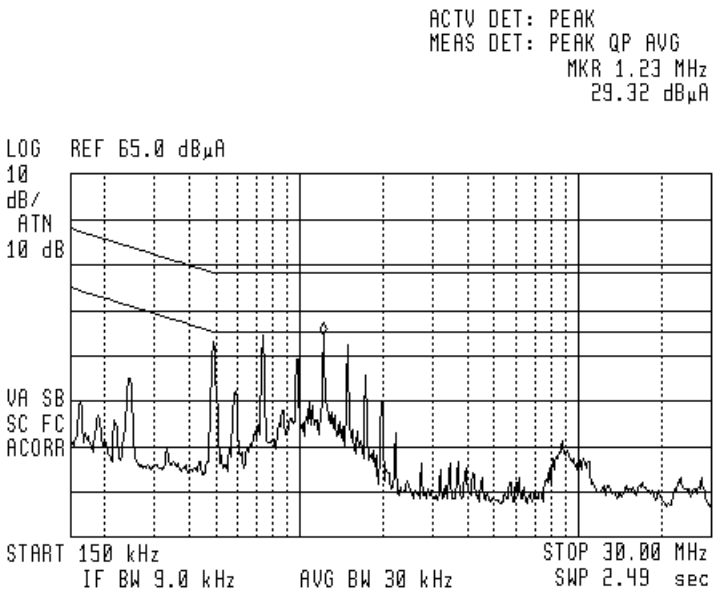

Figure 3. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: LAN Port
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuA)	QP (dBuA)	QP Delta L 1 (dB)	Avg (dBuA)	Av Delta L 2 (dB)
1	0.743633	7.7	6.8	-36.2	5.6	-24.5
2	0.991363	8.8	6.3	-36.7	3.8	-26.2
3	1.237939	16.0	15.6	-27.4	13.3	-16.7
4	1.485432	10.0	11.3	-31.7	14.5	-15.5
5	1.733234	13.1	12.3	-30.7	11.4	-18.6
6	1.982771	8.8	7.2	-35.8	0.4	-29.6
7	4.528712	3.6	0.7	-42.3	-0.6	-30.6

Figure 4. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: LAN Port
Detectors: Peak, Quasi-peak, Average

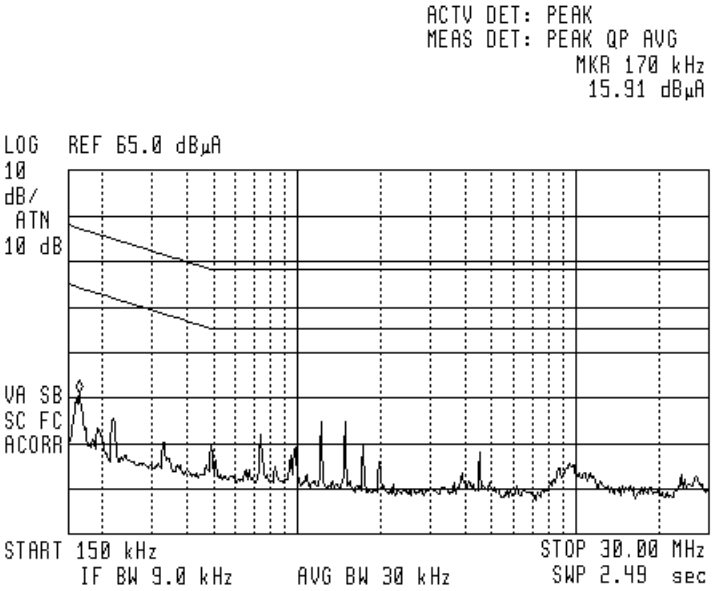

Figure 5. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: SFP Port
Detectors: Peak, Quasi-peak, Average

Signal Number	Frequency (MHz)	Peak (dBuA)	QP (dBuA)	QP Delta L 1 (dB)	Avg (dBuA)	Av Delta L 2 (dB)
1	0.169089	15.8	13.5	-38.5	7.1	-31.9
2	0.946744	6.3	3.9	-39.1	0.4	-29.6
3	3.925465	4.2	1.9	-41.1	0.6	-29.4
4	4.650540	7.0	5.5	-37.5	5.1	-25.0
5	6.975367	9.9	8.5	-34.5	8.1	-21.9
6	8.887347	6.5	1.4	-41.6	-4.1	-34.1
7	9.301712	11.9	9.9	-33.1	8.5	-21.5

Figure 6. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refer to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**
Lead: SFP Port
Detectors: Peak, Quasi-peak, Average

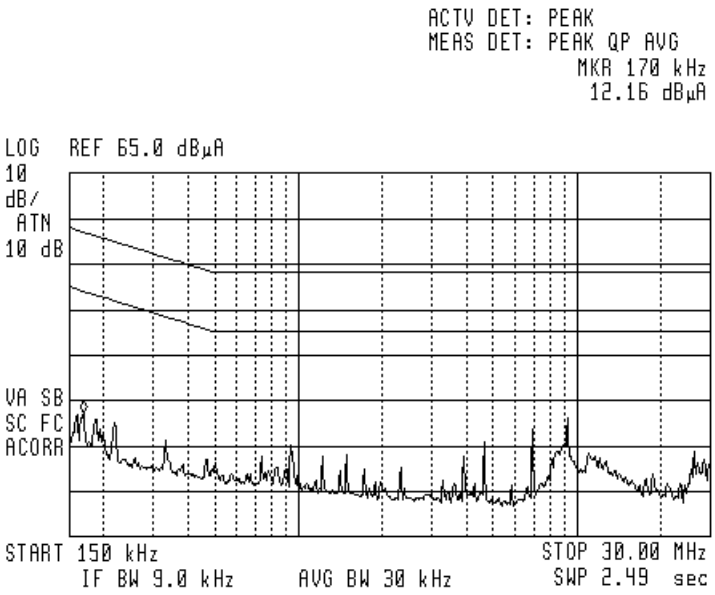

Figure 7. Detectors: Peak, Quasi-peak, Average

9. Radiated Emission

9.1 Test Specification

30-6000 MHz, CISPR 22 Edition 5.2: 2006, CLASS A

9.2 Test Procedure

The E.U.T operation mode and test set-up are as described in section 7.1.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 11. Radiated Emission Test*.

The E.U.T. highest frequency source or used frequency is 2.5 GHz.

The frequency range 30-6000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

Turning the E.U.T on and off.
Using a frequency span less than 10 MHz.
Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The emissions were measured at a distance of 3 meters on the OATS.

In the frequency range 1.0 - 6 GHz, a computerized EMI receiver complying to CISPR 16 requirements was used. During peak measurements, the I.F. bandwidth was 1 MHz, and video bandwidth 3 MHz. During average measurements, the I.F. bandwidth was 1 MHz and video bandwidth was 100 Hz.

The readings were maximized by adjusting the turntable azimuth between 0-360°, and the antenna polarization.
Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The emissions were measured at a distance of 3 meters inside the anechoic chamber.

9.3 Test Results

The E.U.T met the requirements of the CISPR 22 Edition 5.2: 2006, Class A specification requirements.

The margin between the emission level and the specification limit is 6.1 dB in the worst case at the frequency of 44.64 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 8* to *Figure 9*.

Radiated Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006,Class A

Antenna Polarization: Horizontal/Vertical
Antenna: 3 meters distance

Frequency range: 30 MHz to 1000 MHz
Detectors: Peak, Quasi-peak

Frequency	QP Amp	Antenna Polarization:		Limit	Margin
(MHz)	dBµV/m	Hor.	Ver.	dBµV/m	(dB)
83.00	39.6	X		50.5	-10.9
150.65	38.8	X		50.5	-10.7
155.51	36.2	X		50.5	-14.3
125.00	40.9	X		50.5	-9.6
218.26	41.4	X		50.5	-9.1
204.69	32.6	X		50.5	-17.9
37.98	43.8		X	50.5	-6.7
44.64	44.4		X	50.5	-6.1
77.95	43.1		X	50.5	-7.4
125.00	41.2		X	50.5	-9.3
206.11	40.2		X	50.5	-10.3
210.26	41.7		X	50.5	-8.8

Figure 8. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL Detectors: Peak, Quasi-peak

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description	Network Switch
Type	ODS3-XL With Redundant 500W DC Power Supply
Serial Number:	Not designated

Specification: CISPR 22 Edition 5.2: 2006, Class **A**

Antenna Polarization: Horizontal/Vertical
Antenna: 3 meters distance
Frequency range: 1 GHz to 6 GHz
Detectors: Peak, Average

Frequency	Peak Reading	Average Reading	Antenna Polarization:		Limit	Margin
(MHz)	dBµV/m	dBµV/m	Hor.	Ver.	dBµV/m	(dB)
1250.00	49.6		X		76.0	-26.4
1250.00		47.2	X		56.0	-8.8
3125.05	60.1		X		80.0	-19.9
3125.05		52.6	X		60.0	-7.4
1099.95	55.7			X	76.0	-20.3
1099.95		49.3		X	56.0	-6.7
1249.99	52.8			X	76.0	-23.2
1249.99		44.7		X	56.0	-11.3

Figure 9. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL. Detectors: Peak, Average

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

10. Set Up Photographs

Figure 10. Conducted Emission From Telecommunication Ports Test

Figure 11. Radiated Emission Test

11. Signatures of the E.U.T's Test Engineers

Test	Test Engineer Name	Signature	Date
Conducted Emissions From Telecommunication Ports	Y. Mordukhovitch		29.12.11
Radiated Emissions	Y. Mordukhovitch		29.12.11

12. APPENDIX A - CORRECTION FACTORS

12.1 Correction factors for CABLE

**from EMI receiver
to test antenna
at 3 AND 10 meter range.**

FREQUENCY	CORRECTION FACTOR		FREQUENCY	CORRECTION FACTOR
(MHz)	(dB)		(MHz)	(dB)
30	1.96		700	11.25
35	2.08		800	12.53
40	2.26		900	13.86
45	2.43		1000	14.86
50	2.59		1200	15.7
55	2.65		1400	17.05
60	2.86		1600	18.2
65	2.96		1800	19.4
70	3.04		2000	21.3
75	3.27			
80	3.41			
85	3.54			
90	3.68			
95	3.77			
100	3.93			
110	4.19			
120	4.41			
130	4.6			
140	4.83			
150	5.06			
160	5.35			
170	5.57			
180	5.7			
190	5.84			
200	6.02			
250	6.86			
300	7.59			
350	8.09			
400	8.7			
450	9.15			
500	9.53			
550	9.82			
600	10.24			
650	10.74			

NOTES:

1. The cable type is **RG-214/U**

12.2 Correction factors for CABLE 1-6 GHz

from EMI receiver to test antenna at 3 range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
30	0.7	500	3.4
35	0.8	550	3.4
40	0.9	600	3.7
45	0.9	650	3.8
50	1	700	4
55	1	800	4.3
60	1.1	900	4.5
65	1.2	1000	4.8
70	1.1	1500	6.1
75	1.3	2000	6.4
80	1.3	2500	8.5
90	1.3	3000	8.8
100	1.5	3500	9
110	1.5	4000	10.8
120	1.6	4500	11.6
130	1.7	5000	12.2
140	1.7	5500	12.8
150	1.8	6000	13
160	1.8	6500	13.4
170	2	7000	14.1
180	2	7500	13.8
190	1.9	8000	14.6
200	2.1	8500	16.9
250	2.3	9000	16.5
300	2.6	9500	19.4
350	2.8	10000	19.8
400	2.9	10500	20.2
450	3.2	13000	20.6

12.3 Correction factors for Amplifier 8447F 30M-1.3G GAIN

FREQUENCY (MHz)	GAIN (dB)
20	27.16
30	27.18
50	27.15
100	27.01
200	26.48
500	27.54
1000	26.96
1100	26.69
1200	26.28
1300	25.85

12.4 Correction factors for Amplifiers 83006A and 50-8P

FREQUENCY (GHz)	GAIN (dB)
1.0	49.3
2.0	51.5
3.0	52.7
4.0	53.8
5.0	51.7
6.0	51.8
7.0	50.1
8.0	47.4
9.0	47.3
10.0	46.2
11.0	47.6
12.0	47.1
13.0	48.4

12.5 Correction factors for Bilog ANTENNA

Model: 3142
Antenna serial number: 1250
3 meter range

FREQUENCY (MHz)	AFE (dB/m)	FREQUENCY (MHz)	AFE (dB/m)
30	18.4	1100	25
40	13.7	1200	24.9
50	9.9	1300	26
60	8.1	1400	26.1
70	7.4	1500	27.1
80	7.2	1600	27.2
90	7.5	1700	28.3
100	8.5	1800	28.1
120	7.8	1900	28.5
140	8.5	2000	28.9
160	10.8		
180	10.4		
200	10.5		
250	12.7		
300	14.3		
400	17		
500	18.6		
600	19.6		
700	21.1		
800	21.4		
900	23.5		
1000	24.3		

12.6 Correction factors for Horn ANTENNA

Model: 3115
Antenna serial number: 6142
3 meter range

FREQUENCY (MHz)	Antenna Factor (dB/m)	FREQUENCY (MHz)	Antenna Factor (dB/m)
1000	23.9	10500	38.4
1500	25.4	11000	38.5
2000	27.3	11500	39.4
2500	28.5	12000	39.2
3000	30.4	12500	39.4
3500	31.6	13000	40.7
4000	33	14000	42.1
4500	32.7	15000	40.1
5000	34.1	16000	38.2
5500	34.5	17000	41.7
6000	34.9	17500	45.7
6500	35.1	18000	47.7
7000	35.9		
7500	37.5		
8000	37.6		
8500	38.3		
9000	38.5		
9500	38.1		
10000	38.6		

13. APPENDIX B - MEASUREMENT UNCERTAINTY

13.1 Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 4.96 dB

13.2 Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) 0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 3.44 dB

14. Appendix C – VCCI Labeling Instructions

14.1 Labeling Instructions

The Regular Member shall put the following statement on a Class A ITE or Class B ITE, as reported.

1. **Class A ITE**

A Class A ITE shall have the following message in a visible location on each product. If direct marking is difficult, a tag can be used.

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

Translation:

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 corrective actions.

Note 1: The characters shall not be less than 2 mm high. If adequate space is unavailable, the character size may be reduced as long as the characters are readable.

Note 2: VCCI-A means that the equipment satisfies the limits of interference for Class A ITE.

Note 3: The above statement **must** be printed in J**apanese**.

2. **Class B ITE**

A Class B ITE shall have the following label in a visible location on each product:

14.2 Statements for User Manual

For Class A ITE or Class B ITE ,a Regular Member shall supply one of the following messages in instruction manuals:

For ITE that is reported based on the result of measuring at the user's installation site, the Regular Member shall add the message shown in clause 3 to the contents of the instruction manual already supplied to the user.

1. **Class A ITE**

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラス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。

Translation:
This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI).If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

2. **Class B ITE**

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。 取扱説明書に従って正しい取り扱いをして下さい。

Translation:
This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI).If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

Note: The above statements **must** be printed in **Japanese.**