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DATE: 07 February 2017

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

Test Report According to EN55032; EN55024; EN 61000-3-2; EN 61000-3-3

for

Microsemi Corp - Mixed Signal Group Ltd.

Equipment under test:

Power Over Ethernet (POE) Midspan

PD-9024G-AC-M-F Full Load With UTP Cables

* See declaration page 6.

Approved by: For/_____
D. Yadidi

Approved by: _____
D. Shidlowsky

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1. General Information

1.1. Administrative Information

Manufacturer:	Microsemi Corp - Mixed Signal Group Ltd.
Manufacturer's Address:	1 Hanagar St. P.O.B. 7220 Hod Hasharon 45421 Israel Tel: +972-9-775-5100 Fax: +972-9-775-5111
Manufacturer's Representative:	Nadav Gleit
Equipment Under Test (E.U.T):	Power Over Ethernet (POE) Midspan
Equipment Model No.:	PD-9024G-AC-M-F Full Load With UTP Cables*
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	05/05/09, 18/12/16
Start of Test:	7/05/09, 18/12/16
End of Test:	7/06/09, 18/12/16
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 71100
Test Specifications:	EN 55032: 2012 + AC/2013 EN 55024: 2010; EN 61000-3-2: 2014; EN 61000-3-3: 2013 (See following Notes)

* See customer's declaration on following page.
Notes:

1. The E.U.T. was originally tested between 5 May to 7 June 2009 to the following standards: EN 55022: 2006+A1: 2007, EN 55024: 1998+ A1: 2001,A2: 2003, EN 61000-3-2: 2006, EN 61000-3-3: 1995+ A1: 2001, A2: 2005. See details in ITL test report no. E90488.00.
2. EFT/B (on EUT with Serial No.: N16131238000262A07) was re-tested on 18 December 2016 according to the new test method in EN 61000-4-4: 2004 in order to meet the new requirements of EN 55024: 2010.
3. Since the test methods and limits of the newer versions of the standards remain unchanged (except for EFT/B), the device meets the requirements of the newer versions of the standards.
4. The latest versions of the standards are used in this test report.

Microsemi

Date Feb 1st 2017

DECLARATION

I hereby declare that model

PD-9024G/AC/M/F

is electrically, physically, and mechanically to:
PD-9024G-1kW Full Load With UTP Cables

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

Thank you,

Signature: _____
Printed Name: Ronen Dozly
Title: Project manager

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
AMN	artificial mains network
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
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.), Designation No. IL1005.
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.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025A-1.

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	**EMC Directive: 2014**	*DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)*
2.2	**EN 55032: 2012 + AC:2013**	*Electromagnetic compatibility of multimedia equipment –Emission requirements*
2.3	**EN 55024: 2010**	*Information Technology Equipment –Immunity Characteristics – Limits and Methods of Measurement*
2.4	**EN 61000-3-2: 2014**	*Electromagnetic Compatibility (EMC), Part 3: Limits Section 2-Limits for Harmonic Currents Emissions (equipment input current ≤16 A per phase)*
2.5	**EN 61000-3-3: 2013**	*Electromagnetic Compatibility (EMC), Part 3: Limits Section 3: Limitation of Voltage Fluctuations and Flicker in low-voltage supply systems for equipment with rated current ≤16 A*
2.6	**IEC 61000-4-2: 2008**	*Electromagnetic Compatibility (EMC)- Part 4: Testing and Measurement Techniques-Section 2: Electrostatic discharge immunity tests: - Basic EMC publication.*
2.7	**IEC 61000-4-3: 2006 + A1: 2007; A2: 2010**	*Electromagnetic Compatibility (EMC),- Part 4: Testing and Measurement Techniques- Section 3: Radiated, radio frequency, electromagnetic field immunity test – Basic EMC Publication.*
2.8	**IEC 61000-4-4: 2004**	*Electromagnetic compatibility (EMC), - Part 4. Testing and measurement techniques - Section 4: Electrical fast transient /burst immunity test - Basic EMC Publication.*
2.9	**IEC 61000-4-5: 2005**	*Electromagnetic Compatibility (EMC), - Part 4: Testing and Measurement Techniques - Section 5: Surge immunity test – Basic EMC Standard.*
2.10	**IEC 61000-4-6: 2008**	*Electromagnetic Compatibility (EMC), - Part 4: Testing and Measurement Techniques- Section - 6:Immunity to conducted disturbances induced by radio-frequency fields.*

2.11	**IEC 61000-4-8: 2009**	*Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 8. Power frequency magnetic field immunity test.*
2.12	**IEC 61000-4-11: 2004**	*Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurement Techniques - Section 11: Voltage dips, short interruptions and voltage variations. Immunity tests.*

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.

4. Summary of Test Results

Test	Results
Conducted Emissions From AC Mains EN 55032: 2012 + AC: 2013 Class **B**	The E.U.T met the performance requirements of the specification. The margin between the emission levels and the specification limit is, in the worst case, 3.1 dB for the phase line at 0.16 MHz and 1.4 dB at 0.18 MHz for the neutral line.
Conducted Emissions From Telecommunicaion Ports EN 55032: 2012 + AC: 2013 Class **B**	The E.U.T met the performance requirements of the specification. The margin between the emission levels and the specification limit is, in the worst case, 4.2 dB for the UTP port at 7.11 MHz. The margin between the emission levels and the specification limit is, in the worst case, 8.0 dB for the Ethernet port at 5.72 MHz.
Radiated Emissions EN 55032: 2012 + AC: 2013 Class **B**	The E.U.T met the performance requirements of the specification. The margin between the emission level and the specification limit is 6.4 dB in the worst case at the frequency of 54.42 MHz, vertical polarization.
Harmonic Emissions EN 61000-3-2: 2014	The E.U.T met the performance requirements of the specification.

Summary of Test Results (cont'd.)

Test	Results
Voltage Fluctuations EN 61000-3-3: 2013	The E.U.T met the performance requirements of the specification.
ESD IEC 61000-4-2: 2008 Air Discharge, 8kV Contact Discharge, 4kV	The E.U.T met the performance requirements of the specification.
Radiated Immunity IEC 61000-4-3: 2006 + A1: 2007; A2: 2010 (80-1000 MHz) 3 V/m, 80% A.M. by 1kHz	The E.U.T met the performance requirements of the specification.
EFT/B IEC 61000-4-4: 2004 1kV Power lines 0.5kV Signal lines	The E.U.T met the performance requirements of the specification.
Conductive Surges IEC 61000-4-5: 2005 Common mode; 2kV Differential mode; 1kV	The E.U.T met the performance requirements of the specification.
Conducted Disturbances IEC 61000-4-6: 2008 (0.15-80 MHz) 3 VRMS, 80% A.M. by 1kHz	The E.U.T met the performance requirements of the specification.

Summary of Test Results (cont'd.)

Test	Results
Immunity to Magnetic Field IEC 61000-4-8: 2009 1 A/m, 50Hz	The E.U.T met the performance requirements of the specification.
Voltage Dips and Short Interruptions IEC 61000-4-11: 2004 Voltage reduction: 1) >95%, 2) 30%, 3) >95% Duration: 1) 0.5 period, 2) 25 periods, 3) 250 periods	The E.U.T met the performance requirements of the specification.

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

About the Power over Ethernet Midspan

PowerDsine's family of Power over Ethernet Midspans, series 9000G, injects power over data-carrying Ethernet cabling. The PD-9006G/9012G/9024G Midspans, support 6, 12 and 24 ports respectively in a 10/100/1000BaseTx Ethernet network, over TIA/EIA-568 Category 5/5e/6 cabling. DC operating power, for data terminal units, is fed over pairs cabling (7/8 and 4/5). The Power over Ethernet Midspan normally powers devices that are 'Power over Ethernet Enabled'or are equipped to receive power over Ethernet. These devices are called Powered Devices (PDs). Devices that are not can receive power over Ethernet, may require an external power adapter in order to be powered. Contact PowerDsine for such an adapter.

Power over Ethernet Midspan main features:

Safe and reliable power over existing Ethernet infrastructure

Eliminates the need for AC outlets, local UPS & AC/DC adapters near PDs

Remote Management using Web control and/or SNMPv3

Highest level of Network Security

Safe solution that protects network infrastructure

Standards compliant.

Power Management

When establishing a network, the total power required by the PDs may exceed the total power available from the Midspan. The built-in Power Management feature does not allow total power output to exceed maximum power available (refer to the Technical Specifications). When total power available is near maximum, attempts to connect an additional PD to a free port cause the port corresponding LED to blink green, indicating an out-of-power state. This port does not deliver power. Power distribution is based on "first come, first served" logic. Sometimes, connected and operating PDs significantly increase or suddenly raise their power requirements. If the power required exceeds the power available, the Midspan starts turning off ports, starting from the last port down, until the total power is once again under the maximum available limit.

List of ancillary and/or support equipment provided by the applicant

Description	Manufacturer	Model/Part Number	Serial Number
PoE Tester	Microsemi	---	---
Laptop	Lenovo	X61s	---

Description of Interface Cables for Testing

Cable Type	Shield	Length [m]	Ferrite	Connection1	Connection2
Ethernet UTP	no	< 3	no	Data and Power Out Port	PoE Tester

Input/Output Ports:

Port No.	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	**Enclosure**	**N/E**	**—**	**—**	**None**
1	Data In	TP	---	---	
2	Data and Power Out Port	TP & DC	< 3	no	PoE
3					

*Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
50 MHz			

Power Interface

Mode No.	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (No.)	Comments
Rated	**100 – 240**	**2**	**---**	**50/60**	**1**	
1	**230**	**---**	**---**	**50**	**1**	
Supplementary information:						

6. List of Test Equipment

6.1. Immunity Tests

Equipment indicated below by an "X" used in **Tests IEC 61000-4:-2,-3,-4,-5,-6,-8,-11.**

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	Manuf.	Model	Serial No.	Used in Test IEC 61000-4:						
				-2	-3	-4	-5	-6	-8	-11
Transient Generator	KeyTek	CEMASTER	9612436			X				
ESD Simulator	CDI	ESD 2000i	426	X						
Isotropic Field Probe	AR	EP-2080	23190		X					
Signal Generator	HP	8657A	2849U01094		X			X		
RF Amplifier	AR	100W1000M1	19842		X					
Isotropic Field Monitor	AR	FM-2000	19719		X					
Biconilog Antenna	EMCO	3142B	1078		X					
Horn Antenna	A.H. systems	SAS 200/571	199		X					
BulkF Current Probe	FCC	F-120-9	105					X		
RF Amplifier	AR	500A100	19896					X		
Transient Wave- form Monitor	CDI	TWM-100	3233				X			
Phase Control Amplifier	CDI	PCA-1000	3217				X			
Single Phase Isolated Backfilter	CDI	CDI-1kVA	3221				X			
Surge Generator	CDI	CDI-1000i	3153				X			
1.2/50; 8/20usec AC Surge Unit	KeyTek	E551	9512398							
Surge Generator	EM TEST	UCS 500-M	1198-45				X			
AC Power Source	EM TEST	UCS 500-M	1198-45							X
Current Generator	FCC	F-1000-4-8-125A	9838						X	
Magnetic Loop	FCC	F-1000-4-8/9/10-L-1M	9836						X	
RF Amplifier	AR	25S1G4	23102							
RF Amplifier	AR	20T4G18	21296							

6.2. Emission Tests

The equipment indicated below by an "X" was used for testing Conducted Emission (**CE**), Radiated Emission (**RE**), and **IEC 61000-3-2;3**

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	-2	-3
AMN	EMCO	3810/2BR	1297	X			
Transient Limiter	HP	11947A	3107A03041	X			
Current Probe	FCC	F51	163	X			
EMI Receiver	HP	8546A	3650A00365	X	X		
Receiver RF Filter Section	HP	85460A	3650A00365	X	X		
RF Amplifier	HP	8447F	3113A06386		X		
EMC Analyzer	HP	HP8593	3536A00120		X		
Biconilog Antenna	EMCO	3142B	1250		X		
Horn Antenna	ETS	3115	6142				
Antenna Mast	ETS	2070-2	9608-1497		X		
Turntable	ETS	2087	-		X		
Mast & Table Controller	ETS/EMCO	2090	9608-1456		X		
Power Analysis System	EM Test	DPA 500	0501/09			X	X
AC Power Source	EM Test	ACS 500	1101/01			X	X

7. E.U.T. Performance Verification

7.1. Mode of Operation

The E.U.T. was operated with full load and UTP cables.

Each of the 24 ports was loaded by a 90 Ohm resistor. The NMS cable was connected to a monitoring PC.

All Data & Power OUT cables were 15m long.

EFT/B

The EUT was operated with UTP Ethernet cable and was powered from 230V/ 50Hz.

The following ports were used during the EFT/B test:

- DATA IN port No.1
- DATA & POWER OUT port No.1
- NMS (Network Management System) port

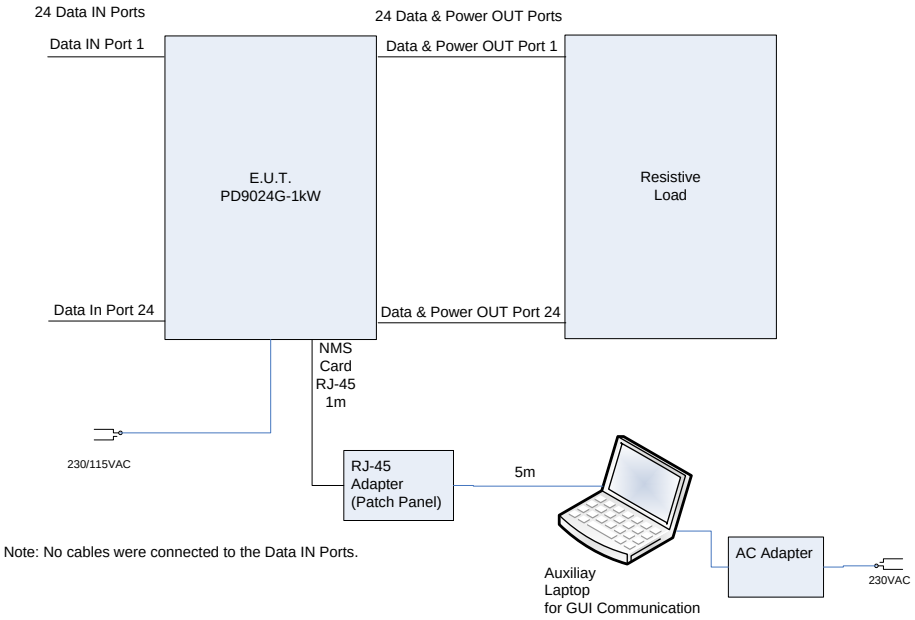


Figure 1. Test Set-up

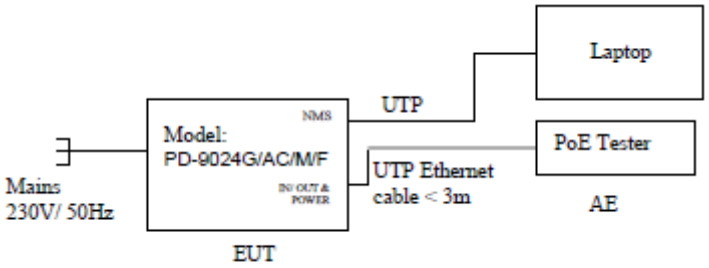


Figure 2. EFT/B Test Set-up

7.2. Monitoring of E.U.T.

The indication LEDs on front panel of the E.U.T. and AUX computer PING "window" were observed.

EFT/B

The indication LEDs on the front panel were observed.

After the test, an existence of the tested port was checked by connecting NMS (Network Management System) port to the Laptop via IP remote access.

7.3. Definition of Failure

1. For all Immunity tests, except ESD, Voltage interruption tests:
    a. blinking or “OFF” position of the Channels’ LEDs
    b. cessation of blinking of communication indication LED
    c. change the color or “OFF’ position of the power indication LED
    d. cessation of blinking of “transmit” & “receive” indicators on the AUX computer “PING” window
2. For ESD test: Same from paragraph 7.3.1 above without self-recovery to normal operation after cessation of the disturbances.
3. For Voltage interruption test: Same as paragraph 7.3.1 above after regular operation of the controls

8. Conducted Emission From AC Mains

8.1. Test Specification

0.15-30 MHz, EN 55032: 2012 + AC: 2013, CLASS B

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 an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The E.U.T was powered via 50 Ohm / 50 µHn Artificial Mains Network (AMN) on the phase and neutral lines. The AMN'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 22. Conducted Emission From AC Mains Test*.

The emission voltages at the AMN's outputs 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 EN 55032: 2012 + AC: 2013, CLASS B specification.

The margin between the emission levels and the specification limit is, in the worst case, 3.1 dB for the phase line at 0.16 MHz and 1.4 dB at 0.18 MHz for the neutral line.

The details of the highest emissions are given in *Figure 3* to *Figure 5*.

Conducted Emission

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 55032: 2012 + AC: 2013, Class **B**
Lead: Phase
Detectors: Peak, Average, Quasi-peak

Frequency MHz	Peak dBuV	QP dBuV	QP Lim dBuV	DelLim-QP dB	Avg dBuV	Avg Lim dBuV	DelLim-Avg dB
0.161654	71.57	62.36	65.43	-3.08	29.30	55.43	-26.13
0.189648	54.78	54.88	64.07	-9.19	23.28	54.07	-30.78
0.218078	46.99	46.05	62.96	-16.91	43.10	52.96	-9.86
0.325682	47.86	39.88	59.60	-19.72	30.61	49.60	-18.99
0.435089	44.08	38.51	57.21	-18.71	29.90	47.21	-17.31
0.536012	36.69	31.58	56.00	-24.42	31.35	46.00	-14.65
7.093988	41.87	33.61	60.00	-26.39	25.36	50.00	-24.64

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

Note: DelLim-QP/DelLim-Avg 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	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 55032: 2012 + AC: 2013, Class **B**
Lead: Neutral
Detectors: Peak, Average, Quasi-peak

Frequency MHz	Peak dBuV	QP dBuV	QP Lim dBuV	DelLim-QP dB	Avg dBuV	Avg Lim dBuV	DelLim-Avg dB
0.159644	71.41	60.43	65.53	-5.09	27.24	55.53	-28.29
0.180851	71.13	63.05	64.50	-1.44	30.94	54.50	-23.56
0.189648	54.78	54.88	64.07	-9.19	23.28	54.07	-30.78
0.218078	46.99	46.05	62.96	-16.91	43.10	52.96	-9.86
0.354733	42.51	40.45	58.91	-18.46	40.29	48.91	-8.62
0.433699	44.19	40.98	57.24	-16.26	31.40	47.24	-15.84
0.545141	32.09	30.19	56.00	-25.81	22.05	46.00	-23.95
7.099946	54.36	48.19	60.00	-11.81	42.15	50.00	-7.85

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

Note: DelLim-QP/DelLim-Avg 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	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification:	EN 55032: 2012 + AC: 2013, Class **B**
Lead:	Phase\Netural
Detectors:	Peak, Average, Quasi-peak

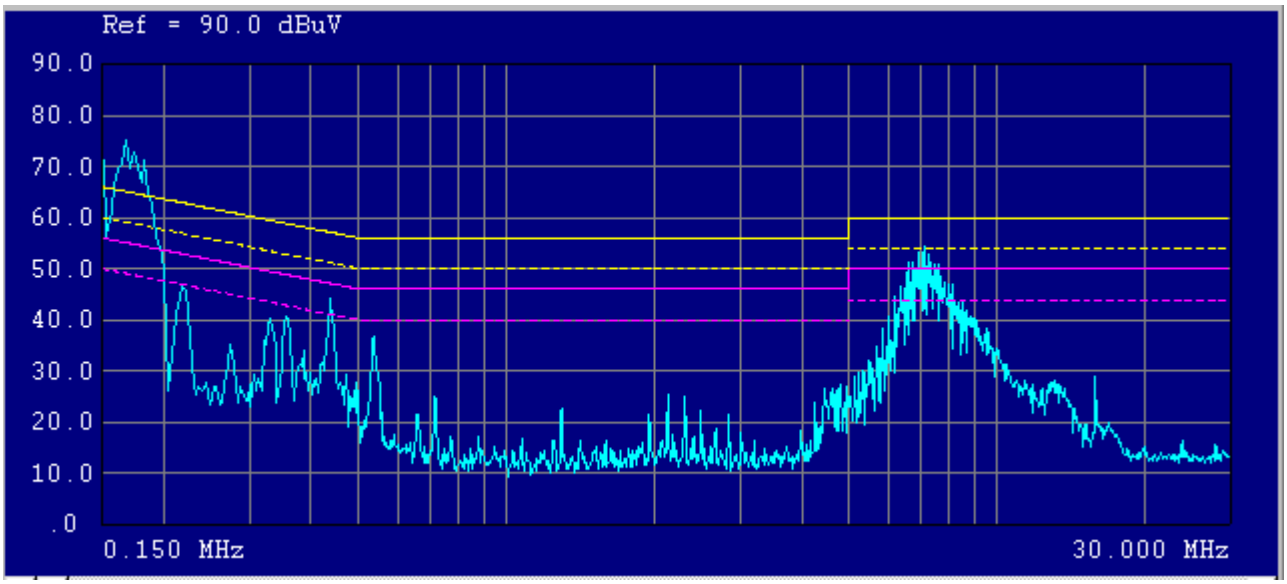


Figure 5 Conducted Emission: PHASE\NEUTRAL
Detectors: Peak, Average, Quasi-peak

9. Conducted Emission From Telecommunication Ports

9.1. Test Specification

0.15-30 MHz, EN 55032: 2012 + AC: 2013, CLASS B

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 an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall. Floor-standing E.U.T. was placed on the horizontal ground plane. 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 EN 55032: 2012, Annex C (Current Probe 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 23. Conducted Emission From Telecommunication Ports Test*.

The output voltages of the current probe 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 EN 55032: 2012 + AC: 2013, CLASS B specification.

The margin between the emission levels and the specification limit is, in the worst case, 4.2 dB for the UTP port at 7.11 MHz.

The margin between the emission levels and the specification limit is, in the worst case, 8.0 dB for the Ethernet port at 5.72 MHz.

The details of the highest emissions are given in *Figure 6* to *Figure 9*.

Conducted Emission

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 55032: 2012 + AC: 2013, Class **B**
Lead: UTP
Detectors: Peak, Average, Quasi-peak

Frequency	Peak	QP	QP Limit	Delimit QP	Avg	AVG Limit	Delimit Avg
(Hz)	dBµV	dBµV	dBµV	dB	dBµV	dBµV	dB
176.86K	62.7	61.8	83.2	-21.4	60.8	73.2	-12.4
355.96K	57.4	55.2	78.1	-22.9	53.0	68.1	-15.1
536.55K	56.36	56.3	74.0	-17.7	51.9	64.0	-12.1
2.13M	54.7	51.8	74.0	-22.2	48.7	64.0	-15.3
2.31M	56.1	52.1	74.0	-21.9	50.1	64.0	-13.9
7.11M	63.63	62.8	74.0	-11.2	59.8	64.0	-4.2
15.93M	54.5	50.0	74.0	-24.0	44.1	64.0	-19.9

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

Note: DelLim-QP/DelLim-Avg 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	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 55032: 2012 + AC: 2013, Class **B**
Lead: UTP
Detectors: Peak, Average, Quasi-peak

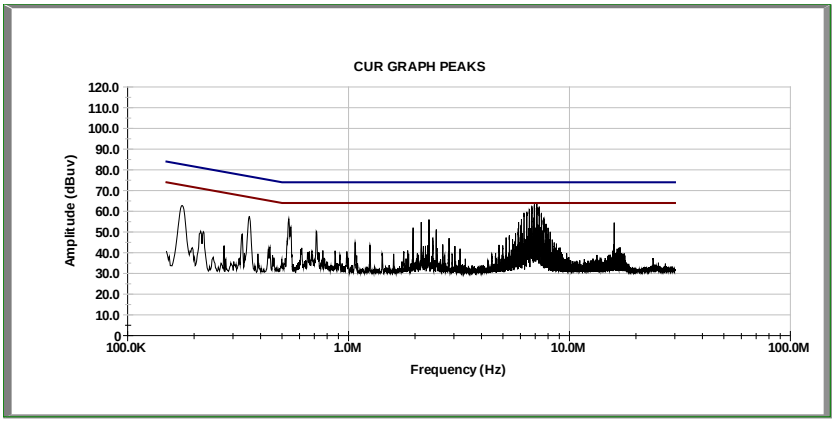


Figure 7. Conducted Emission:
Detectors: Peak, Average, Quasi-peak

Conducted Emission

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 55032: 2012 + AC: 2013, Class **B**
Lead: ETH 01
Detectors: Peak, Average, Quasi-peak

Frequency MHz	Peak dBµV	AVG dBµV	Margin dB
2.83	31.5	64.0	-32.5
5.35	54.4	64.0	-9.6
5.72	56.0	64.0	-8.0
9.02	49.1	64.0	-14.9
16.23	39.6	64.0	-24.4
26.55	36.2	64.0	-27.8

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

Notes:

1. *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.*
2. *Peak Reading was compared to average limit.*

Conducted Emission

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 55032: 2012 + AC: 2013, Class **B**
Lead: ETH 01
Detectors: Peak, Average, Quasi-peak

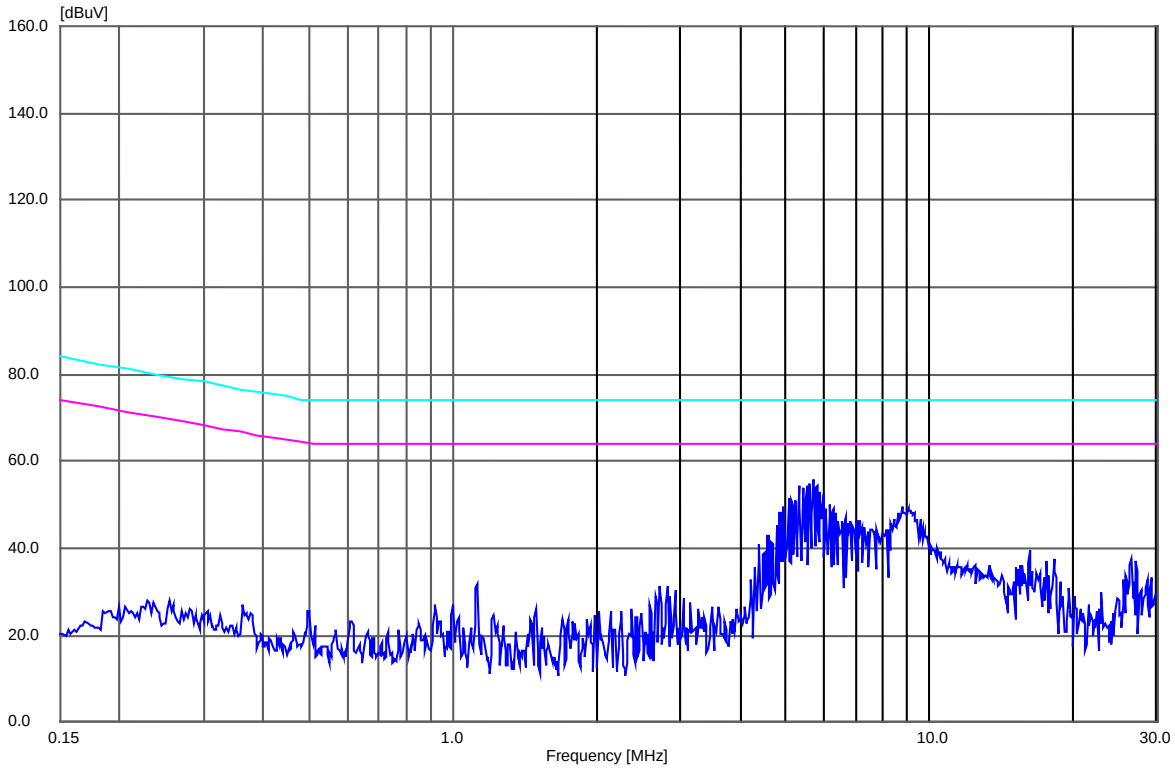


Figure 9. Conducted Emission:
Detectors: Peak, Average, Quasi-peak

10. Radiated Emission

10.1. Test Specification

30-1000 MHz, EN 55032: 2012 + AC: 2013, CLASS **B**

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. 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. For table-top products, the E.U.T was placed on a non-metallic table, 0.8 meters above the ground. For floor-standing products, the E.U.T. was placed directly on the horizontal ground plane, but was separated from metallic contact with the ground plane by up to 15 cm of insulation. 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 24. Radiated Emission Test*.

The E.U.T. highest frequency source or used frequency is 50.0 MHz.

The frequency range 30-1000 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.

10.3. Test Results

The E.U.T met the requirements of the EN 55032: 2012 + AC: 2013, CLASS **B** specification.

The margin between the emission level and the specification limit is 6.4 dB in the worst case at the frequency of 54.42 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 10*.

Radiated Emission

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 55032: 2012 + AC: 2013, Class **B**

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)
42.51	31.6	27.5		X	40.5	-13.0
54.42	38.4	34.1		X	40.5	-6.4
125.00	30.1	25.0		X	40.5	-15.5
143.33	30.0	26.0		X	40.5	-14.5
250.00	34.5	32.8	X		47.5	-14.7
437.46	38.0	35.0		X	47.5	-12.5
500.00	40.3	36.7	X		47.5	-10.8
562.50	38.8	36.2		X	47.5	-11.3
624.94	42.4	39.1	X		47.5	-8.4
854.26	39.9	33.5		X	47.5	-14.0
923.00	41.8	33.1	X		47.5	-14.40

Figure 10. 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. Harmonics Emissions On Power Lines

11.1. Test Specification

EN 61000-3-2: 2014

11.2. Test Procedure

The test was performed at 230 V AC / 50Hz, with the E.U.T operating as described in Section 7.

The active power input was measured by the power analyzer.

Each Harmonic was compared to the specification limit.

The configuration tested is shown in the photograph, *Figure 25 Harmonics Emissions Test*.

11.3. Tests Results

Long Cyclic State Test:

Average Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 5th Harmonic.

The level was 46.0% of the limit value of Class A.

Maximum Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 25th Harmonic.

The level was 36.2% of the limit value of Class A.

Maximum Voltage Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 3rd Harmonic.

The level was 0.9% of the limit value of Class A.

Quasi Stationary State Test:

Average Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 5th Harmonic.

The level was 46.2% of the limit value of Class A.

Maximum Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 27th Harmonic.

The level was 35.9% of the limit value of Class A.

Maximum Voltage Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 3rd Harmonic.

The level was 0.9% of the limit value of Class A.

Random State Test:

Average Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 5th Harmonic.

The level was 46.0% of the limit value of Class A.

Maximum Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 25th Harmonic.

The level was 36.2% of the limit value of Class A.

Maximum Voltage Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 3rd Harmonic.

The level was 0.9% of the limit value of Class A.

Short Cyclic State Test:

Average Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 5th Harmonic.

The level was 46.0% of the limit value of Class A.

Maximum Current Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 25th Harmonic.

The level was 36.1% of the limit value of Class A.

Maximum Voltage Harmonics

The E.U.T met the specification requirements.

The worst case was measured at 3rd Harmonic.

The level was 0.9% of the limit value of Class A.

12. Voltage Fluctuations on Power Lines

12.1. Test Specification

EN 61000-3-3: 2013

12.2. Test Procedure

The test was performed at 230 VAC/ 50 Hz. The mode of operation was as described in section 7.

The following parameters were measured:

Pst (Short Term Flicker)

Plt (Long Term Flicker)

Dc (Relative Steady State Voltage Change)

Dmax (Maximum Relative Voltage Change)

D(t) (Relative Voltage Change Characteristic)

For Pst measurement, 10 minutes observation was used.

For Plt measurement, 120 minutes observation was used.

The test set-up utilized for this specification is shown in the photograph, *Figure 26 Voltage Fluctuations Test*.

12.3. Test Results

The E.U.T met the requirements of EN 61000-3-3: 2013.

Additional details are given in *Figure 11*.

Voltage Fluctuations on Power Lines

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: EN 61000-3-3: 2013

Parameter	Result	Specification
Pst	0.028	<1.00
Plt	0.028	<0.65
Dc (%)	0.024%	<3.30%
Dmax (%)	0.124%	<4.00%
D(t) (%)	0.000%	<0.50%

Figure 11. Voltage Fluctuations

13. Immunity to Electrostatic Discharge

13.1. Test Specification

IEC 61000-4-2: 2008

13.2. Test Procedure

In the case of tabletop equipment, the E.U.T. was set up on a wooden table 0.8m high on an insulating support 0.5 mm thick above the reference ground plane. In the case of floor-standing equipment, the EUT and cables were set up on an insulating support 0.1m above the reference plane. The test setup is illustrated in the photograph, *Figure 27. Immunity to Electrostatic Discharge Test.*

Photographs in *Figure 12* to *Figure 15* show the locations of test points.

13.2.1 Air Discharge

Potentials of 2, 4 and 8 kV were applied near each applicable test point. At places where discharge occurred, the potential was applied twenty times; ten times negative and ten times positive. The E.U.T.'s performance during the test was verified as detailed in Section 7.

13.2.2 Contact Discharge

Potentials of 2 and 4 kV were applied to each applicable test point. In places where discharge occurred, the potential was then applied twenty times; ten negative and ten positive discharges. To 3 test points, out of the total test points, 150 discharges were applied, 50 to each of the 3 test points. The E.U.T.'s performance during the test was verified as detailed in Section 7.

13.2.3 Indirect Discharge (vertical and horizontal coupling plane)

Potentials of 2 and 4 kV were applied to the center of the vertical edge of the coupling plane at a distance of 0.1 meters from the outer casing of the E.U.T. to each applicable test point.

The potential was applied 10 times for each polarity, to each location of the coupling plane. All four faces of the E.U.T. were completely illuminated.

An ESD of the same characteristics as for the vertical coupling plane was applied to the horizontal coupling plane, at each side of the E.U.T., at a distance of 0.1 meter from it's outer casing. To 1 test point, 50 discharges were applied to the center of the front edge of the horizontal coupling plane.

Additional details are shown in Figure 5 of IEC 61000-4-2: 2008.

The E.U.T.'s performance during the test was verified as detailed in Section 7.

13.3. Test Results

The E.U.T met the requirements of specification IEC 61000-4-2: 2008

Immunity to Electrostatic Discharge

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-2: 2008

Air

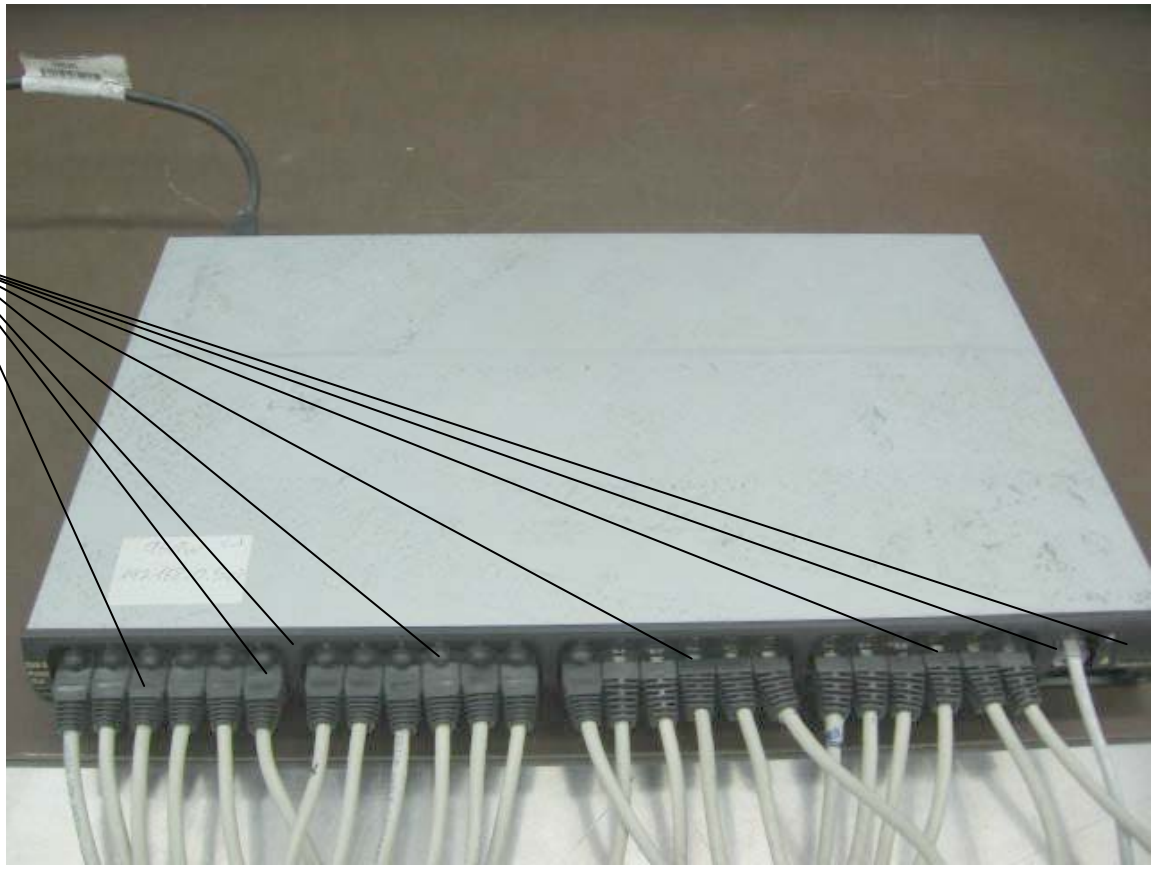


Figure 12. ESD Test Points

Immunity to Electrostatic Discharge

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-2: 2008

Figure 13. ESD Test Points

Immunity to Electrostatic Discharge

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-2: 2008

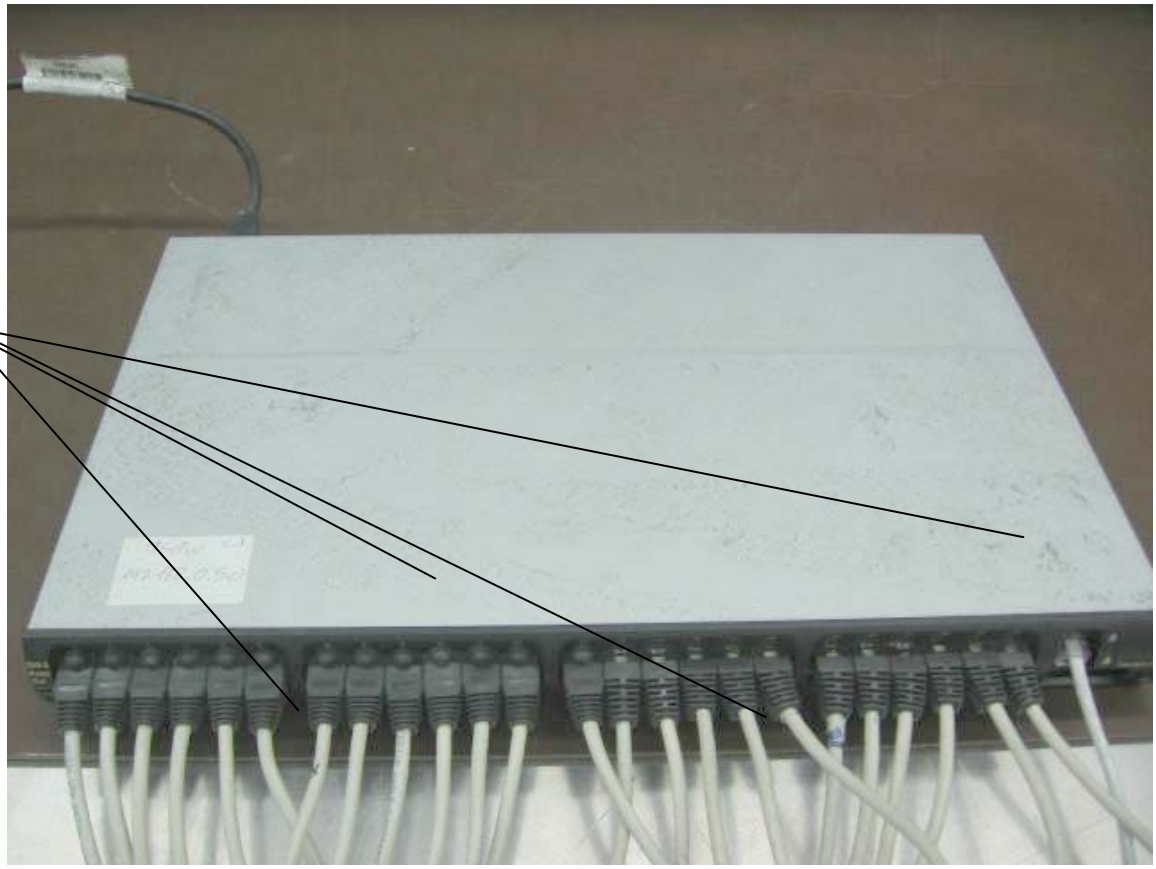


Figure 14. ESD Test Points

Immunity to Electrostatic Discharge

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-2: 2008

Figure 15. ESD Test Points

14. Immunity to Radiated Field

14.1. Test Specification

IEC 61000-4-3: 2006 + A1: 2007; A2: 2010

14.2. Test Procedure

The E.U.T. was subjected to a field of 3V/m, amplitude modulated 80% by a 1kHz sinusoidal signal.

The Radiated Field was applied in vertical and horizontal polarization using Biconilog antenna in the frequency range of 80-1000 MHz.

The Radiated Field was calibrated and tested for uniformity in accordance with Section 6.2 of IEC 61000-4-3.

The calibration values for the driver signal generator were based on the data given in I.T.L. "Radiated Immunity Calibration Test Report" No. PM-112R-IMM.

The frequency was swept using discrete increments having a value less than 1% of the fundamental frequency.

The performance of the E.U.T. was verified during the test as described in Section 7.

The test setup is illustrated in the photograph, *Figure 28. Immunity to Radiated Field Test.*

Note: Opinion and Interpretation:
The most sensitive surface of the E.U.T. was fully tested.
The most sensitive E.U.T. surface was determined as follows:
A preliminary radiated emission test in the frequency range
80 – 1000 MHz was performed inside the semi-anechoic chamber using an E-field probe and spectrum analyzer. The surface having the maximum radiation level was selected as the most sensitive surface.

14.3. Test Results

The E.U.T. passed the Radiated Immunity Tests as required by specification:
IEC 61000-4-3: 2006 + A1: 2007; A2: 2010

For additional information see *Figure 16.*

Radiated Immunity

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-3: 2006 + A1: 2007; A2: 2010, 80-1000 MHz

Amplitude Modulation: 80% AM by 1 kHz

Frequency (MHz)		Antenna Polarity	Specification (V/m)	PASS / FAIL	Immunity Threshold (V/m)
From	To				
80	1000	Horizontal	3.0	Pass	
80	1000	Vertical	3.0	Pass	

Figure 16. Immunity to Radiated Field

15. Immunity to Electrical Fast Transient / Burst

15.1. Test Specification

IEC 61000-4-4: 2004

15.2. Test Procedure

In case of table top equipment, the E.U.T. was placed on non-metallic table 0.8m above the ground plane.

In case of floor mounted equipment, the E.U.T. was placed 0.1 m above a reference ground plane.

The EFT/B generator was placed on, and grounded to, this ground plane. See the photograph,

Figure 29. Immunity to Electrical Fast Transient / Burst Test.

A test signal having the waveform described in *Figure 30. Transient Waveforms* was applied to the phase neutral and ground lines of the E.U.T mains input, at a distance of 1 meter from the E.U.T. The test signal voltage was 1 kV and it was applied for 1 minute to each line, in negative and positive polarities.

The same test signal was applied to the signal lines, control and DC lines (as applicable), that are connected to the E.U.T. The voltage level was 0.5 kV in this case

Applicable signal and control lines should have a length greater than 3m.

15.3. Test Results

The E.U.T. passed the immunity to electrical fast transients / bursts requirements as detailed by specification IEC 61000-4-4: 2004

Additional details are given in *Figure 17*.

Electrical Fast Transient / Burst

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	N16131238000262A07

Specification: IEC 61000-4-4: 2004

[x] Positive Polarity **[x] Negative Polarity**

TEST POINT	PASS / FAIL	ANOMALY	SPECIFICATION (kV)	THRESHOLD (kV)	Notes
Phase	Pass	No anomaly	1.0		Input AC Power
Neutral	Pass	No anomaly	1.0		Input AC Power
Ground	Pass	No anomaly	1.0		Input AC Power
CAPACITIVE CLAMP					
TEST POINT	**PASS / FAIL**	**ANOMALY**	**SPECIFICATION (kV)**	**THRESHOLD (kV)**	**Notes**
Unshielded (UTP) cable					
Ethernet Port- Out 1	Pass	No anomaly	0.5		Data and Power Out Port 1
Ethernet Port- In 1	Pass	No anomaly	0.5		Data In 1
Ethernet Port- NMS	Pass	No anomaly	0.5		Network Management System (NMS)

Figure 17. Immunity to Electrical Fast Transient / Burst

16. Immunity to Conductive Surges

16.1. Test Specification

IEC 61000-4-5: 2005

16.2. Test Procedure

The E.U.T. was subjected to transient signals of the form of double exponential waves with a rise time of 1.2 µs and a pulse width of 50 µs (open circuit). The short circuit waveform is an 8 x 20µs double exponential. See *Figure 31. Open Circuit Waveform (1.2 x 50µs double exponential)*. The surges were applied to the E.U.T. AC power lines in common and differential modes. The differential (between phase and neutral) voltages were 0.5 and 1 kV. The common mode (phase to ground and neutral to ground) voltage were 0.5, 1.0, and 2kV.

The surges were injected in both positive and negative polarities in to the AC line, at phase angles of 0°, 90°, 180°, 270° and 360°; both peak and zero crossings.

At least five surges were applied at each polarity. The surge repetition rate was kept to not more than one per minute.

Signal lines were tested at 0.5 and 1.0 kV (when applicable).

The performance of the E.U.T. was verified during the test as described in section 7.

The test setup is shown in the photograph, *Figure 32. Immunity to Conductive Surges.*

15.3 Test Results

The E.U.T. passed the immunity to surges requirements as detailed by specification: IEC 61000-4-5: 2005

Additional details are given in *Figure 18* to *Figure 19*.

Immunity to Conductive Surges

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-5: 2005

TEST POINT	Polarity	0°/360°	90°	180°	270°	Specified Level	Remarks
Phase to Earth	+	P	P	P	P	0.5, 1, 2 kV	
	-	P	P	P	P	0.5, 1, 2 kV	
Neutral to Earth	+	P	P	P	P	0.5, 1, 2 kV	
	-	P	P	P	P	0.5, 1, 2 kV	
Phase to Neutral	+	P	P	P	P	0.5, 1 kV	
	-	P	P	P	P	0.5, 1 kV	

Figure 18. Immunity to Conductive Surges on AC Lines

NOTE: Each test was executed at least five times.

Immunity to Conductive Surges

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-5: 2005

TEST POINT	Polarity	Specified Level	Remarks
UTP Cable	+ -	0.5, 1 kV 0.5, 1 kV	
ETH Cable	+ -	0.5, 1 kV 0.5, 1 kV	

Figure 19. Immunity to Conductive Surges on Signal Lines

NOTE: Each test was executed at least five times.

17. Immunity to Conducted Disturbances

17.1. Test Specification

IEC 61000-4-6: 2008

17.2. Test Procedure

The E.U.T. was subjected to conducted disturbances in the frequency range 0.15 - 80 MHz, 3 VRMS, 1kHz, 80% AM modulation.

The disturbance signal was applied to the AC power lines using a Coupling Decoupling Network (CDN) or RF Current Injection Probe for Signal Lines.

The driver signal generator levels used are based on calibration that was performed in accordance with Section 6.4 and Annex A of IEC61000-4-6, I.T.L. Procedures PM-111-CDN/M and PM-111-C.P. 105.

The frequency was swept using discrete increments having a value less than 1% of the fundamental frequency.

The performance of the E.U.T. was verified during the test as described in Section 7.

The test setup is illustrated in the photograph *Figure 33. Conducted Disturbances.*

17.3. Test Results

The E.U.T. passed the Conducted Disturbances immunity tests as required by specification IEC 61000-4-6: 2008.

Additional details are given in *Figure 20*.

Immunity to Conducted Disturbances

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-6: 2008
Tested at 1 kHz 80% AM Modulation

Using CDN Network

TEST POINT	PASS / FAIL	ANOMALY	SPECIFICATION (VRMS)	THRESHOLD (kV)
AC Power Port (Phase, Neutral, Ground)	Pass	No anomaly	3	

Signal Lines Using Injection Probe

TEST POINT	PASS / FAIL	ANOMALY	SPECIFICATION (VRMS)	THRESHOLD (kV)
UTP	Pass	No anomaly	3	
ETH 01	Pass	No anomaly	3	

Figure 20. Immunity to Conducted Disturbances

18. Immunity to Magnetic Field

18.1. Test Specification

IEC 61000-4-8: 2009

18.2. Test Procedure

The E.U.T. operation mode and test setup are described in section 7.1.

For table top equipment, the E.U.T. and cables were placed on an insulating support, 0.1m thickness, which was placed on a reference non-magnetic (aluminum) ground plane. The ground plane was placed on a wood table.

For floor standing equipment, the E.U.T. and cables were placed on an insulating support, 0.1m thickness, which was placed on a reference non-magnetic (aluminum) ground plane. The ground plane was placed on the floor.

The E.U.T. was subjected to the magnetic field by using an induction coil. The induction coil was rotated 90° to expose the E.U.T. to all the different field orientations.

For E.U.T.'s larger than the induction coil, the coil was shifted by steps of 50% (of the coil size), so that the volume of the E.U.T. was tested.

The test setup is illustrated in the photograph *Figure 34. Immunity to Magnetic Field*.

18.3. Test Results

The E.U.T. passed the Magnetic Immunity tests as required by specification IEC 61000-4-8: 2009.

Additional details are given in *Figure 21*.

Immunity to Magnetic Field

E.U.T Description	Power Over Ethernet (POE) Midspan
Type	PD-9024G-AC-M-F Full Load With UTP Cables
Serial Number:	Not designated

Specification: IEC 61000-4-8: 2009

	PASS / FAIL	Strength of Magnetic Field (A/m)
Vertical	Pass	1.0
Vertical at 90°	Pass	1.0
Horizontal	Pass	1.0

Figure 21. Immunity to Magnetic Field

19. Voltage Dips and Short Interruptions

19.1. Test Specification

IEC 61000-4-11: 2004

19.2. Test Procedure

The E.U.T. was operated from 230VAC, 50Hz

The following voltage dips and interruptions were applied:

1. Voltage dip: 0.5 period , reduction of > 95% of U_t (rated voltage)

2. Voltage dip: 25 periods, reduction of 30% of U_t.

3. Voltage interruptions: 250 periods, reduction of > 95% of U_t.

Each test was carried out 3 times, using equipment and test methods prescribed in IEC 61000-4-11: 2004

The test setup is shown in the photograph, *Figure 35. Voltage Dips and Short Interruptions.*

19.3. Test Results

The E.U.T. passed the immunity to voltage dips and short interruptions requirements as detailed by specification IEC 61000-4-11: 2004.

20. Set Up Photographs

Figure 22. Conducted Emission From AC Mains Test

Figure 23. Conducted Emission From Telecommunication Ports Test

Figure 24. Radiated Emission Test

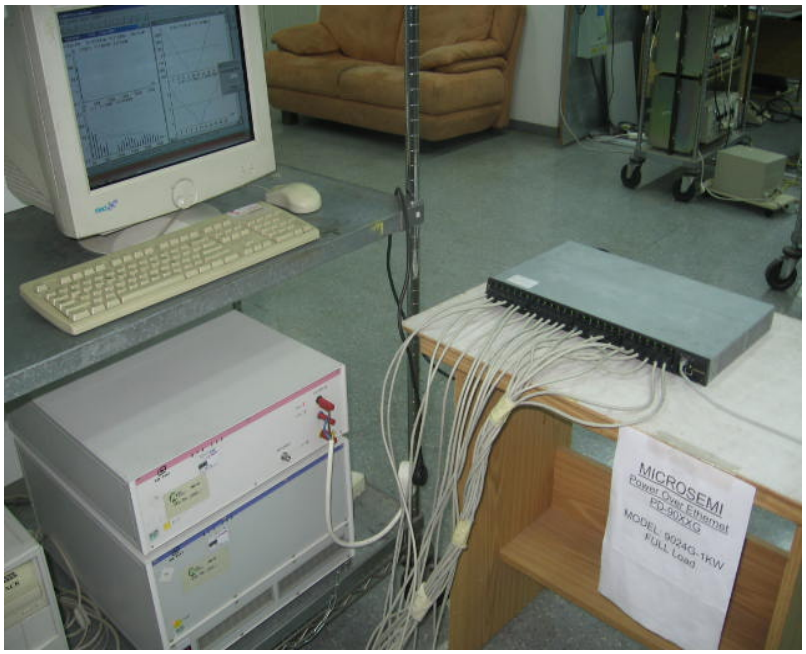


Figure 25 Harmonics Emissions Test

Figure 26 Voltage Fluctuations Test

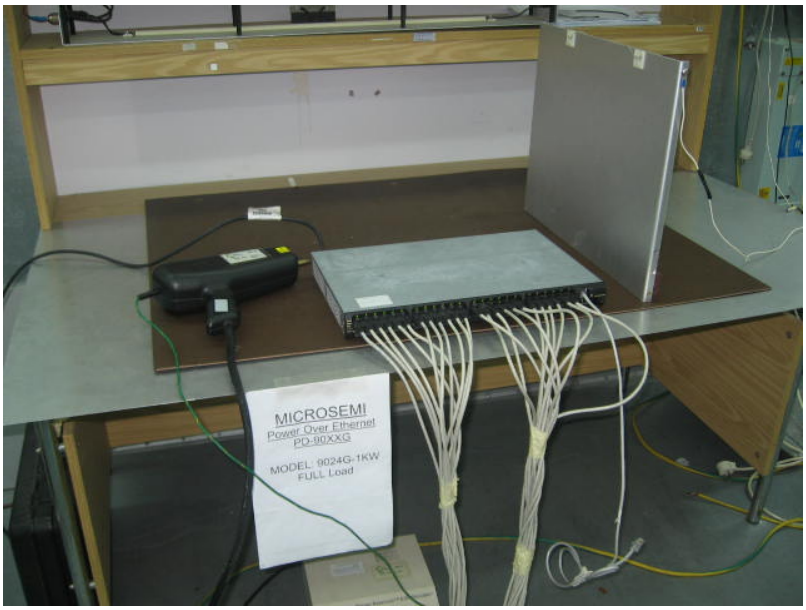


Figure 27. Immunity to Electrostatic Discharge Test

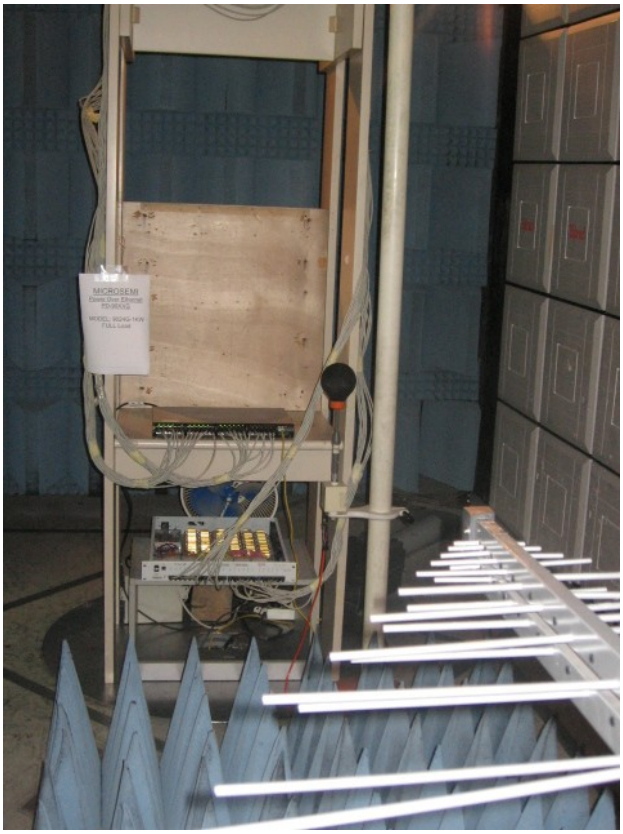


Figure 28. Immunity to Radiated Field Test

Figure 29. Immunity to Electrical Fast Transient / Burst Test

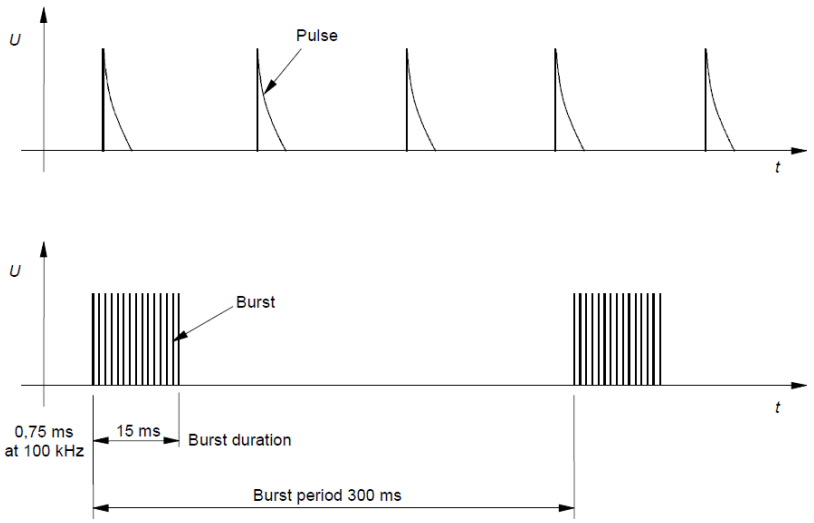
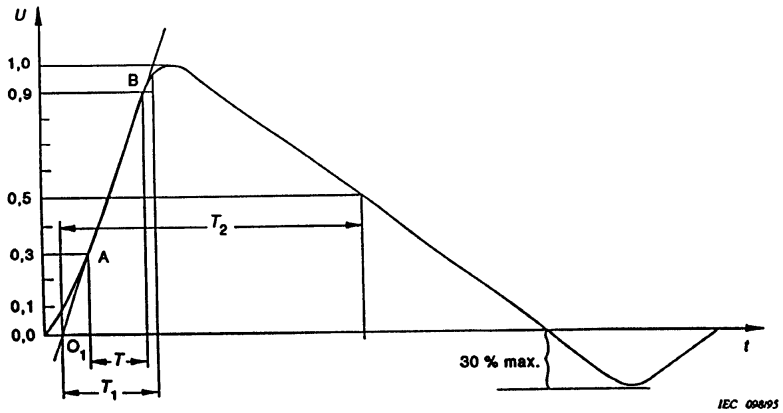


Figure 30. Transient Waveforms



Front time: $T_1 = 1{,}67 \times T = 1{,}2\ \mu s \pm 30\ \%$

Time to half-value: $T_2 = 50\ \mu s \pm 20\ \%$.

Figure 2 – Waveform of open-circuit voltage (1,2/50 µs) (waveform definition according to IEC 60-1)

Figure 31. Open Circuit Waveform (1.2 x 50µs double exponential)

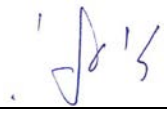
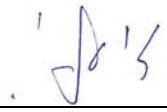
Figure 32. Immunity to Conductive Surges

Figure 33. Conducted Disturbances

Figure 34. Immunity to Magnetic Field

Figure 35. Voltage Dips and Short Interruptions

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

Test	Test Engineer Name	Signature	Date
Conducted Emissions	D. Yadidi	For/ 	27.07.09
Conducted Emissions From Telecommunication Ports	D. Yadidi	For/ 	27.07.09
Radiated Emissions	D. Yadidi	For/ 	27.07.09
Harmonics Emissions	D. Yadidi	For/ 	27.07.09
Voltage Fluctuations	D. Yadidi	For/ 	27.07.09
ESD	D. Yadidi	For/ 	27.07.09
Radiated Immunity	D. Yadidi	For/ 	27.07.09
EFT/B	Y. Yushuvayev		06.02.17
Conductive Surges	D. Yadidi	For/ 	27.07.09
Conducted Disturbances	D. Yadidi	For/ 	27.07.09

Test	Test Engineer Name	Signature	Date
Magnetic Immunity	D. Yadidi	For/ 	27.07.09
Voltage Dips and Short Interruptions	D. Yadidi	For/ 	27.07.09

22. APPENDIX A - CORRECTION FACTORS

22.1. 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**

22.2. 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

22.3. 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		

23. APPENDIX B - MEASUREMENT UNCERTAINTY

23.1. Radiated Emission

The Open Site complies with the ±4 dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

23.2. Conducted Emission

The uncertainty for this test is ±2 dB.