

Declaration of Conformity



Type of equipment: Color CCD Camera
Brand Name /Trade Mark: SAMSUNG TECHWIN
Type designation /model: SDC-415PA, SDC-313APA, SDC-413PA and SCB-1000PA
Applicant: SAMSUNG TECHWIN CO., LTD.

In accordance with the following Directives:

2004/108/EC The Electromagnetic Compatibility Directive
Including amendments by the CE Marking Directive 93/68/EEC

The following harmonized European standards or technical specifications have been applied:

EN 55022:2006	Limits and methods of measurement of radio disturbance characteristics of information technology equipment
EN 61000-3-2:2000	Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)
EN 61000-3-3:1995 +A1:2001	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
EN 50130-4:1995 +A1:1998 +A2:2003	Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
EN 61000-4-2:1995 +A1:1998 +A2:2001	Electrostatic discharge immunity test
EN 61000-4-3:2002 +A1:2002	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2004	Electrical fast transient/burst immunity test
EN 61000-4-5:1995 +A1:2001	Surge immunity test
EN 61000-4-6:1996 +A1:2001	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-11:2004	Voltage dips, short interruptions and voltage variations immunity tests

Test report issued by:

EMC: CTK Co., Ltd.

The CE Marking on the products and/or their packaging signifies that Samsung Techwin Co., Ltd. holds the reference technical file available to the European Union authorities.

Place and date of issue: #42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do, Korea / August 31, 2010

Authorized Signatory: Name : Je Soon, Kang

Title : Principal Research Engineer

Signature :

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EMC TEST REPORT For CE



Test Report No. : 2005080028-4

Date of Issue : August 31, 2010

Model/Type No. : SDC-415PA, SDC-313APA, SDC-413PA and SCB-1000PA

Kind of Product : Color CCD Camera

Applicant : SAMSUNG TECHWIN CO., LTD.

Applicant Address : #42 Seongju-Dong, Changwon-City, Kyungsangnam-Do, Korea

Manufacturer : 1. SAMSUNG TECHWIN CO., LTD.
2. TIANJIN SAMSUNG OPTO-ELECTRONICS CO., LTD.

Manufacturer Address : 1. #42 Seongju-Dong, Changwon-City, Kyungsangnam-Do, Korea
2. #9 zhangheng street. Micro-electronic industrial park
Jingang road, Tianjin, P.R. China

Contact Person : Mr. Kang-Min Kim

Telephone : +82-70-7147-8376

Received Date : December 10, 2007

Test period : Start : December 17, 2007 End : December 20, 2007

Test Results : ☒ In Compliance ☐ Not in Compliance

The test results presented in this report relate only to the object tested.

Tested by

Young-Kug, Song
EMC Test Engineer
Date: August 31, 2010

Reviewed by

James Hong
EMC Technical Manager
Date: August 31, 2010



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REPORT REVISION HISTORY

Date	Revision	Page No
August 19, 2005	Original Issued (2005080028)	All
October 21, 2005	The model SDC-313APA is added. (2005080028-1) This model was deleted Color B/W switching function from the model SDC-415PA.	1 to 4
September 19, 2006	The model SDC-413PA is added. (2005080028-2)	All
December 24, 2007	Addition of Lens Board (2005080028-3)	All
August 31, 2010	Issued (2005080028-4) Addition of Model Name : SCB-1000PA And Change of Applicant Address	All

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1.0 General Product Description

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model SDC-415PA.
- ☒ Tests performed on Model SDC-415PA were considered to be representative of Model(s) SDC-313APA, SDC-413PA and SCB-1000PA.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: Approx. 58(W) by 52(H) by 121(D) ☒ mm ☐ inch
Mobility: ☐ Hand-held ☐ Table-top ☐ Built-in
 ☐ Traveling ☒ Stationary
Serial No.: Prototype

1.0.3 Electrical Ratings

AC Adaptor	Input:	100-240 Vac, 50/60 Hz, 0.1 A
	Output:	24 Vac, 300 mA
EUT	Input:	24 Vac, 3.5 W
	Output:	-

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 230 Vac
Frequency: 50 Hz

1.1 Model Differences

The model SDC-413PA is added.

This model is identical to certified model SDC-415PA except the model designation and Lens board below photo.

Lens board (SDC-415PA)
Front Rear



Lens board (SDC-413PA)
Front Rear



The model SCB-1000PA is added.

SDC-415PA and SCB-1000PA are no technical difference from each model except for Model Name because of marketing purposes.

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
CCTV Monitor	Hi TRON SYSTEMS.INC.	CVM1574FNKR	M6040007
AC Adaptor	SAMSUNG	DRL-24300C	-
IRIS Lens	SAMSUNG	CCTV LENS 8mm 1:1.2	Y1111880

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	AC Adaptor power cable, Unshielded	No	1.5	Connect to AC power
2	AC Adaptor output cable, Unshielded	No	1.0	Between AC Adaptor and EUT
3	CCTV monitor power cable, Unshielded	No	1.8	Connect to AC power
4	BNC cable, Shielded	No	1.5	Between CCTV Monitor and EUT
5	IRIS lens cable, Shielded	No	0.3	Between IRIS LENS and EUT

1.4 Test Software

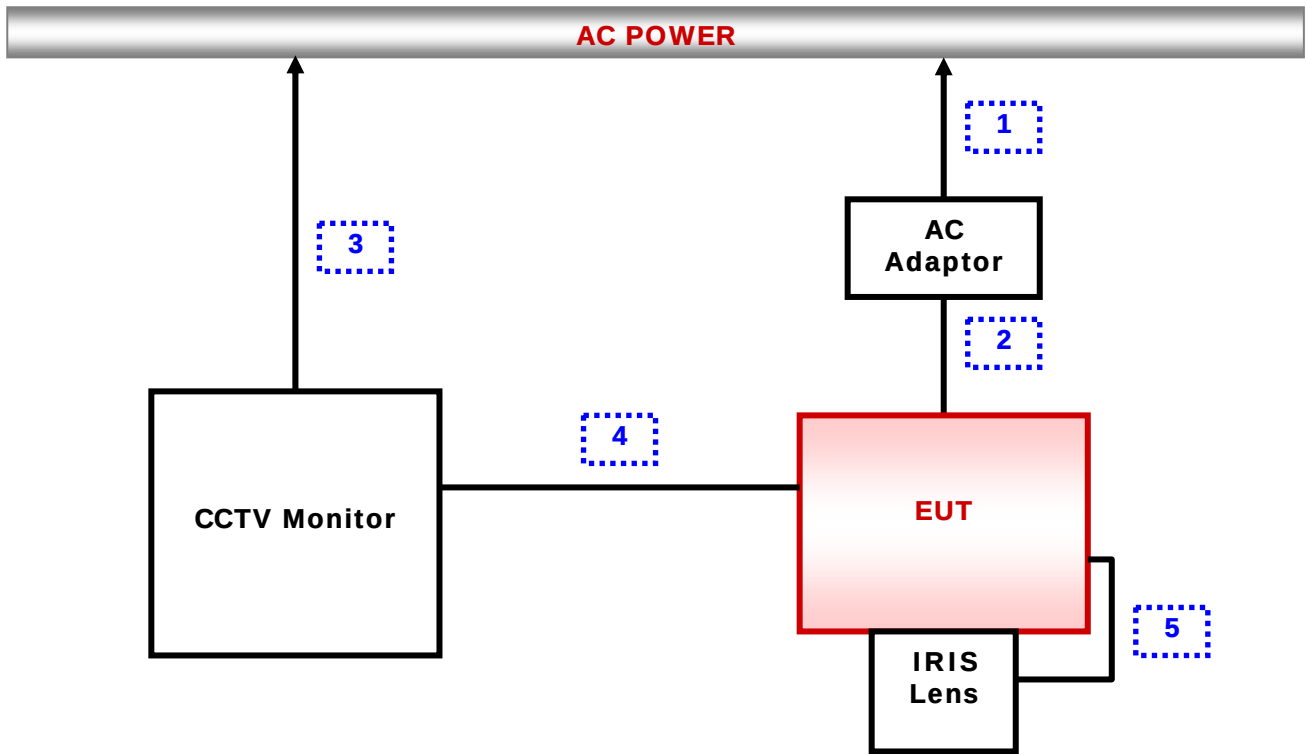
- ☐ EMC Test V 1.0
☐ Display Test Patterns – V1.5
☐ Ping.exe
☒ Not applicable

1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

- ☐ Standby
☐ Display circles pattern
☒ Practice operation – Monitoring the EUT's video signal.
☐ Scrolling 'H'
☐ Read / Write

1.6 Configuration



1.7 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.8 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.9 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	MIC	EMI (10 meter Open Area Test Site and two conducted sites) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 No. 51, KR0025
Europe	GLAS	EMC EN 55011, EN 55022, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 50130-4, EN 55024, EN 61204-3, EN 60601-1-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	 No.13000796-02



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2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

☒ EMC – Directive 2004/108/EC

☐ EN 61000-6-3:2001 +A11:2004

☐ EN 61000-6-3:2007

☐ EN 61000-6-4:2001

☐ EN 61000-6-4:2007

☐ EN 50083-2:2001

☐ EN 55011:1998 +A1:1999 +A2:2002

☐ Group 1

☐ Class A

☐ Group 2

☐ Class B

☐ EN 55013:2001 +A1:2003

☐ EN 55013:2001 +A1:2003 +A2:2006

☐ EN 55014-1:2000 +A1:2001 +A2:2002

☐ EN 55014-1:2006

☐ EN 55015:2000 +A1:2001 +A2:2002

☐ EN 55015:2006

☐ EN 61204-3:2000

☐ Class A

☐ Class B

☐ EN 55022:1998 +A1:2000 +A2:2003

☐ Class A

☐ Class B

☒ EN 55022:2006

☒ Class A

☐ Class B

☒ EN 61000-3-2:2000

☐ EN 61000-3-2:2000 +A2:2005

☐ EN 61000-3-2:2006

☒ EN 61000-3-3:1995 +A1:2001

☐ VCCI V-3/2004.04

☐ Class A

☐ Class B

☐ AS/NZS CISPR22:2004

☐ Class A

☐ Class B

☐ AS/NZS CISPR22:2006

☐ Class A

☐ Class B

☐ FCC Part 15 Subpart B

☐ Class A

☐ Class B

☐ CISPR 22:2005 +A1:2005 +A2:2006

☐ Class A

☐ Class B

☐ CISPR 22:2006

☐ Class A

☐ Class B



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2.1 Conducted Voltage Emissions

Test Date

December 17, 2007

Test Location

Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2008-02-15
☒	LISN	EMCO	3825/2	9607-2575	2008-08-29
☒	LISN	EMCO	3825/2	9409-2246	2008-08-29
☐	Field Strength Meter	Rohde & Schwarz	ESHS30	862024/001	2008-03-05
☐	LISN	Rohde & Schwarz	ESH3-Z5	100207	2008-12-20
☐	LISN	EMCO	3825/2	9206-1971	2008-12-20

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

☒ MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark
21.79	30.7	29.3	Average

☐ NOT MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark

☐ NOT APPLICABLE

Remarks

See Appendix B for test data.



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2.2 Radiated Electric Field Emissions

Test Date

December 18, 2007

Test Location

☒ Testing was performed at a test distance of 10 meter Open Area Test Site

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Field Strength Meter	Rohde & Schwarz	ESVS30	829673/015	2008-01-12
☒	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2008-06-12
☐	Biconical Antenna	EMCO	3110	9202-1510	2008-04-25
☐	Log-periodic Antenna	EMCO	3146	9607-4567	2008-04-25

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ MET

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
214.25	33.0	7.0	Quasi-peak

☐ NOT MET

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark

☐ NOT APPLICABLE

Remarks

See Appendix B for test data



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2.3 Harmonic Current Emissions and Voltage Fluctuations and Flicker

Test Date

December 18, 2007

Test Location

Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Power Quality Test System	SCHAFFNER	ProfLine 2103	54350, 200048-202EK	2008-02-26

Classification Of Equipment for Harmonic Current Emissions

- ☒ Class A
☐ Class B
☐ Class C
☐ Class D

Test Results

Harmonic requirements are:

- ☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Flicker requirements are:

- ☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Remarks

See Appendix B for test data.



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3.0 Immunity Test Regulations

The immunity tests were performed according to following regulations:

- ☒ EMC – Directive 2004/108/EC
- ☐ EN 61000-6-1:2001
- ☐ EN 61000-6-2:2001
- ☐ EN 61000-6-2:2005
- ☐ EN 50083-2:2001
- ☐ EN 50083-2:2001 +A :2005
- ☐ EN 50083-2:2006
- ☒ EN 50130-4:1995 +A1:1998 +A2:2003
- ☐ EN 61204-3:2000
 - ☐ Low severity level – residential, commercial or light-industrial environments
 - ☐ High severity level – industrial environment
- ☐ EN 55014-2:1997 +A1:2001
- ☐ EN 55020:2002 +A1:2003
- ☐ EN 55020:2002 +A1:2003 +A2:2005
- ☐ EN 55020:2007
- ☐ EN 55024:1998 +A1:2001 +A2:2003
- ☐ EN 60601-1-2:2001
- ☐ EN 60601-1-2:2001 +A1:2006
- ☒ EN 61000-4-2:1995 +A1:1998 +A2:2001
- ☒ EN 61000-4-3:2002 +A1:2002
- ☒ EN 61000-4-4:2004
- ☒ EN 61000-4-5:1995 +A1:2001
- ☒ EN 61000-4-6:1996 +A1:2001
- ☐ EN 61000-4-8:1993 +A1:2001
- ☒ EN 61000-4-11:2004



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3.1 Criteria for compliance

Criteria for compliance was based on the following guidelines:

Test Item	Criteria for compliance
Electrostatic Discharge	There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.
Radiated Electromagnetic Fields	There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at a field strength of 3 V/m. For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m, providing. a) there is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings etc.); b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and c) there is no observable deterioration of the picture at 1 V/m. For components with radio links, it is accepted that communications via the radio link may not be possible during the conditioning within the transmitter and receiver exclusion bands defined in the relevant part of ETSI EN 301 489 for that type of radio link equipment. If the EUT is designed to detect and indicate this loss of communication, then this indication is permitted, providing it is in accordance with the manufacturer's specification. It may be necessary to use appropriate filters to ensure that failures out of the exclusion bands are not due to harmonics generated by the test system. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.
Fast Transients Bursts	There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the bursts is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.
Slow High Energy Voltage Surge	There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the surges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.



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Conducted Disturbance	There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at $U_0 = 130$ dBuV. For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at $U_0 = 140$ dBuV, providing: a) there is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings etc.); b) at $U_0 = 130$ dBuV, any deterioration of the picture is so minor that the system could still be used, and; c) there is no observable deterioration of the picture at $U_0 = 120$ dBuV. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.
Mains Supply Voltage Variations	There shall be no damage, malfunction or change of status due to the different supply voltage conditions. The EUT shall meet the acceptance criteria for the functional test, during the conditioning.
Mains Supply Voltage Dips and Short Interruptions	There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.



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3.2 Electrostatic Discharge

Reference Standard

EN 61000-4-2:1995 +A1:1998 +A2:2001

Test Date

December 19, 2007

Test Location

EMS-ESD: Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	ESD Simulator	Noiseken	ESS-2000	0199C02387	2008-03-29
☒	ESD Gun	Noiseken	TC-815P	0199C02417	2008-03-29

Test Specifications

Discharge Factor: ≥ 1 second

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: ≥ 10 at all locations for Air discharge
 ≥ 25 at all locations for Contact discharge

Discharge Voltage:	Contact	Air	HCP	VCP
	☒ 2 kV	☒ 2 kV	☒ 2 kV	☒ 2 kV
	☒ 4 kV	☒ 4 kV	☒ 4 kV	☒ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

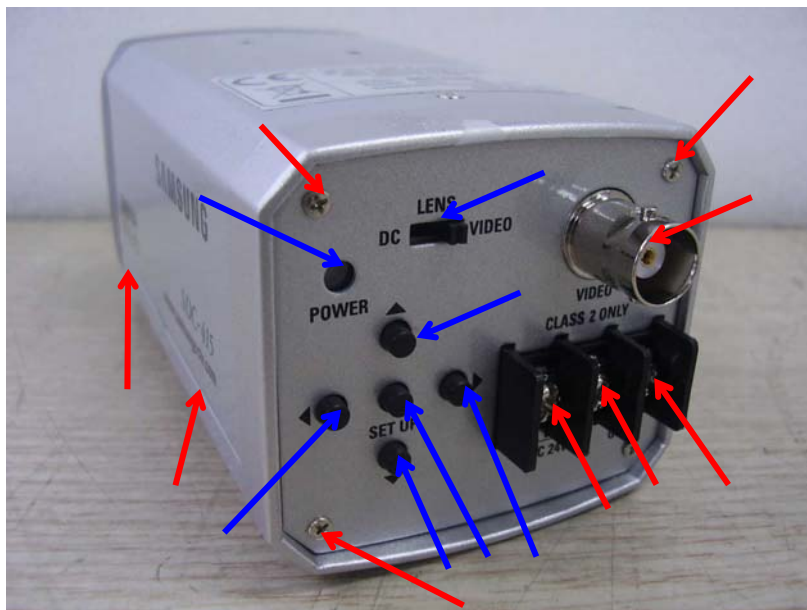
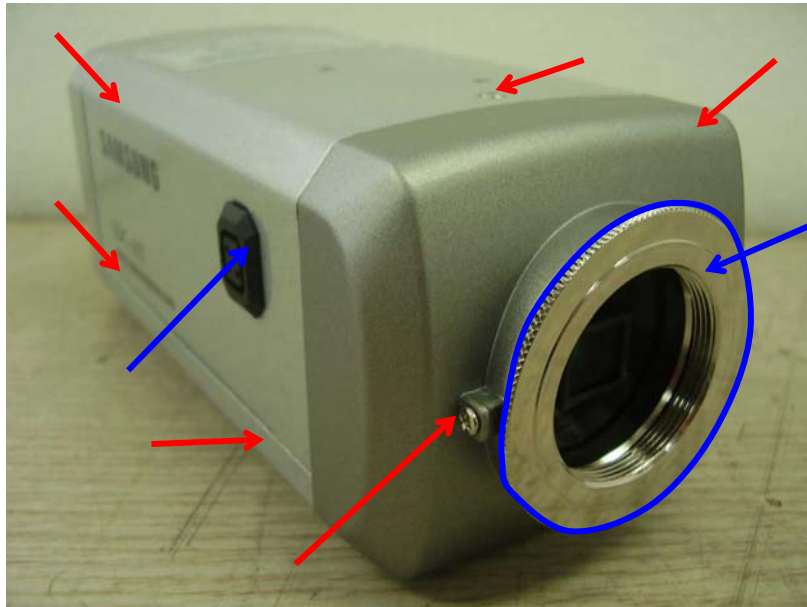
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Test Data

Test Conditions:	Temperature:	21 °C
	Relative Humidity:	35 %
	Atmospheric Pressure:	1003 mbar

Location of Discharge:

Air
Contact



Test Results

- ☒ MET Required Performance Criteria
- ☐ NOT MET Required Performance Criteria

Remarks

During the Contact ± 6 kV Test on the metal surface, the metal part of I/O ports and screws, the white dots appeared.



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3.3 Radiated Electromagnetic Fields

Reference Standard

EN 61000-4-3:2002 +A1:2002

Test Date

December 18, 2007

Test Location

EMS-RS: Fully anechoic chamber

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Power Meter	Agilent	E4418B	MY45104818	2008-03-28
☒	Control Unit System Controller	Noiseken	NA25MF1G2010	A00148	N/A
☒	Power Sensor	HP	8482A	US37293310	2008-08-30
☒	BAND 1 Power Amplifier	Noiseken	NA25MF1G2010	A00148	2008-08-28
☒	BAND 2 Power Amplifier	Noiseken	NA25MF1G2010	A00148	2008-08-28
☒	P.S. UNIT Power Supply	Noiseken	NA25MF1G2010	A00148	N/A
☒	RF AMPLIFIER	Noiseken	NA1GF3G50	A70540	2008-05-17
☒	Signal Generator	R&S	SML03	103171	2008-03-16
☒	Bilog Antenna	Schaffner-Chase	CBL6111C	2551	2008-03-08
☒	Double Ridged Broadband Horn Antenna	SCHWARZBECK MESS	BBHA 9120 E	BBHA 9120 E 337	2009-04-10

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 meters

Field Strength: ☒ 1 V/m ☒ 3 V/m
☒ 10 V/m

Frequency Range: ☐ 27 MHz to 500 MHz ☒ 80 MHz to 2 GHz
☐ 26 MHz to 1 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0.5 s ON : 0.5 s OFF)

Frequency step: ☒ 1 % step

of Sides Radiated: ☐ 4 ☒ 6



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Test Data

☒ AM, 80 %, 1 kHz sine wave

Dwell Time: 3 sec at 1 V/m

Side Exposed	Observation	
	Horizontal	Vertical
Front	No any function degraded	No any function degraded
Right	No any function degraded	No any function degraded
Back	No any function degraded	No any function degraded
Left	No any function degraded	No any function degraded
Top	No any function degraded	No any function degraded
Bottom	No any function degraded	No any function degraded

Dwell Time: 3 sec at 3 V/m

Side Exposed	Observation	
	Horizontal	Vertical
Front	No any function degraded	No any function degraded
Right	No any function degraded	No any function degraded
Back	No any function degraded	No any function degraded
Left	No any function degraded	No any function degraded
Top	No any function degraded	No any function degraded
Bottom	No any function degraded	No any function degraded

Dwell Time: 3 sec at 10 V/m

Side Exposed	Observation	
	Horizontal	Vertical
Front	No any function degraded	No any function degraded
Right	No any function degraded	No any function degraded
Back	No any function degraded	No any function degraded
Left	No any function degraded	No any function degraded
Top	No any function degraded	No any function degraded
Bottom	No any function degraded	No any function degraded



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☒ PM, 1 Hz (0.5 s ON : 0.5 s OFF)

Dwell Time: 3 sec at 1 V/m

Side Exposed	Observation	
	Horizontal	Vertical
Front	No any function degraded	No any function degraded
Right	No any function degraded	No any function degraded
Back	No any function degraded	No any function degraded
Left	No any function degraded	No any function degraded
Top	No any function degraded	No any function degraded
Bottom	No any function degraded	No any function degraded

Dwell Time: 3 sec at 3 V/m

Side Exposed	Observation	
	Horizontal	Vertical
Front	No any function degraded	No any function degraded
Right	No any function degraded	No any function degraded
Back	No any function degraded	No any function degraded
Left	No any function degraded	No any function degraded
Top	No any function degraded	No any function degraded
Bottom	No any function degraded	No any function degraded

Dwell Time: 3 sec at 10 V/m

Side Exposed	Observation	
	Horizontal	Vertical
Front	No any function degraded	No any function degraded
Right	No any function degraded	No any function degraded
Back	No any function degraded	No any function degraded
Left	No any function degraded	No any function degraded
Top	No any function degraded	No any function degraded
Bottom	No any function degraded	No any function degraded

Note: "Blank" = Not performed

Test Conditions: Temperature: 19 °C
Relative Humidity: 31 %
Atmospheric Pressure: 1004 mbar

Test Results

☒ MET Required Performance Criteria
☐ NOT MET Required Performance Criteria

Remarks

See above observations in tables.



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3.4 Fast Transients Bursts

Reference Standard

EN 61000-4-4:2004

Test Date

December 20, 2007

Test Location

EMS-EFT: Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Fast Transient Noise Simulator	Noiseken	FNS-AX II	7079B00212	2008-07-16
☒	Capacitive Coupling Clamp	Noiseken	15-00001A	-	N/A

Test Specifications

Pulse Amplitude & Polarity:
(Power Lines)

☒ ± 0.5 kV
☒ ± 2.0 kV

☒ ± 1.0 kV

Pulse Amplitude & Polarity:
(Signal Lines)

☒ ± 0.25 kV
☒ ± 1.0 kV

☒ ± 0.5 kV

Burst Period:

☒ 300 ms

☐ 2 s

Repetition Rate:

☒ 5 kHz

Duration of Test Voltage:

☒ ≥ 1 minute



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Test Data

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	OBSERVATIONS		
	(±) Burst (kV)		
	0.5	1.0	2.0
L1	No any function degraded		
L2	No any function degraded		
L1 & L2	No any function degraded		

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	OBSERVATIONS		
	(±) Burst (kV)		
	0.5	1.0	2.0

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	OBSERVATIONS		
	(±) Burst (kV)		
	0.25	0.5	1.0
VIDEO	No any function degraded		

Note: “Blank” = Not performed

Test Conditions: Temperature: 20 °C
 Relative Humidity: 32 %
 Atmospheric Pressure: 1003 mbar

Test Results

- ☒ MET Required Performance Criteria
☐ NOT MET Required Performance Criteria

Remarks

See above observations in tables.



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3.5 Slow High Energy Voltage Surge

Reference Standard

EN 61000-4-5:1995 +A1:2001

Test Date

December 20, 2007

Test Location

EMS-Surge: Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Lightning Surge Simulator	Noiseken	LSS-6030	0189E00251	2008-08-21
☒	Surge Generator	EM Test AG	TSS 500	1100-05	2008-01-11
☐	Coupling Network	EM Test AG	CNV 508 S1	0601-06	N/A
☒	Coupling Network	EM Test AG	CNV 508 S2	0601-07	N/A

Test Specifications

Power Lines

Source Impedance: 12 Ω for common mode and 2 Ω for differential mode

Surge Amplitude:

Common Mode

☐ 0.5, 1.0 & 2.0 kV

Differential Mode

☒ 0.5 & 1.0 kV

Number of Surges:

☒ 5 surges per angle

Angle:

☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity:

☒ Positive & Negative

Repetition Rate:

☒ 1 surge per minute

Signal Lines

Source Impedance:

42 Ω for common mode

Surge Amplitude:

Common Mode

☒ 0.5 & 1.0 kV

Number of Surges:

☒ 5 Surges

Polarity:

☒ Positive & Negative

Repetition Rate:

☒ 1 Surge per minute



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Test Data

Power Lines

☐ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS		
	(±) Surge (kV)		
	0.5	1.0	2.0
L1 to PE			
L2 to PE			

☒ Line to Line – Differential Mode

Mode of Application	OBSERVATIONS	
	(±) Surge (kV)	
	0.5	1.0
L1 to L2	No any function degraded	
L2 to L1	No any function degraded	

Signal Lines

☒ Signal Lines

Mode of Application	OBSERVATIONS	
	(±) Surge (kV)	
	0.5	1.0
VIDEO	No any function degraded	

Note: "Blank" = Not performed

Test Conditions: Temperature: 21 °C
 Relative Humidity: 33 %
 Atmospheric Pressure: 1003 mbar

Test Results

- ☒ MET Required Performance Criteria
☐ NOT MET Required Performance Criteria

Remarks

See above observations in tables.



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3.6 Conducted Disturbance

Reference Standard

EN 61000-4-6:1996 +A1:2001

Test Date

December 20, 2007

Test Location

EMS-CS: Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Power Meter	HP	E4419B	GB39290775	2008-08-28
☒	RF Power Amplifier	Schaffner-Chase	CBA954815	1011	2008-08-28
☒	Power Sensor	Agilent	E9304A	MY41497499	2008-01-22
☒	Signal Generator	HP	8657D	3332A00555	2008-08-28
☒	Function Generator	HP	33120A	US36009168	2008-08-28
☒	Attenuator	BIRD	100-A-FFN-06	9933	2008-08-31
☒	RF-SYNTHESIZER/AMPLIFIER	Schaffner	NSG2070-1	1068	2008-01-11
☒	Attenuator	Schaffner	INA2070-1	2068	2008-01-11
☒	CDN	Noiseken	NCDN-M2-32A	2001	2008-01-11
☐	CDN	Noiseken	NCDN-M3-32A	2016	2008-01-11
☐	CDN	Noiseken	NCDN-T2	2001	2008-01-11
☐	CDN	Noiseken	NCDN-T4	2002	2008-01-11
☐	CDN	Noiseken	NCDN-T8	2015	2008-01-11
☒	CDN	Noiseken	NCDN-C1-50-BNC	2001	2008-01-11
☐	EM Clamp	Noiseken	NEM-23	275	2008-08-30
☐	EM Clamp	Noiseken	NEM-23	540	2008-05-16

Test Specifications

Frequency range:

- ☒ 150 kHz to 100 MHz
☐ 150 kHz to 230 MHz

- ☐ 10 kHz to 30 MHz
☐ 10 kHz to 100 MHz

Voltage Level:

- ☒ 1 Vrms
☒ 10 Vrms

- ☒ 3 Vrms

Modulation:

- ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0.5 s ON : 0.5 s OFF)

Frequency step:

- ☒ 1 % step



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Test Data

☒ AM, 80 %, 1 kHz sine wave

Dwell Time: 3.0 sec at 1 V

Coupling Location (Line Stressed)	Coupling Method	Observation
Input a.c. power port	CDN(M2)	No any function degraded
BNC cable	CDN(C1)	No any function degraded

Dwell Time: 3.0 sec at 3 V

Coupling Location (Line Stressed)	Coupling Method	Observation
Input a.c. power port	CDN(M2)	No any function degraded
BNC cable	CDN(C1)	The horizontal line noise appeared

Dwell Time: 3.0 sec at 10 V

Coupling Location (Line Stressed)	Coupling Method	Observation
Input a.c. power port	CDN(M2)	The horizontal line noise appeared
BNC cable	CDN(C1)	The horizontal line noise appeared

☒ PM, 1 Hz (0.5 s ON : 0.5 s OFF)

Dwell Time: 3.0 sec at 1 V

Coupling Location (Line Stressed)	Coupling Method	Observation
Input a.c. power port	CDN(M2)	No any function degraded
BNC cable	CDN(C1)	No any function degraded

Dwell Time: 3.0 sec at 3 V

Coupling Location (Line Stressed)	Coupling Method	Observation
Input a.c. power port	CDN(M2)	No any function degraded
BNC cable	CDN(C1)	The horizontal line noise appeared

Dwell Time: 3.0 sec at 10 V

Coupling Location (Line Stressed)	Coupling Method	Observation
Input a.c. power port	CDN(M2)	The horizontal line noise appeared
BNC cable	CDN(C1)	The horizontal line noise appeared

Notes: CDN = Coupling Decoupling Network
EMC = Electro Magnetic Clamp
"blank" = Not performed



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Test Conditions: Temperature: 22 °C
 Relative Humidity: 34 %
 Atmospheric Pressure: 1003 mbar

Test Results

- ☒ MET Required Performance Criteria
☐ NOT MET Required Performance Criteria

Remarks

See above observations in tables.



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3.7 Mains Supply Voltage Variations

Reference Standard

EN 50130-4:1995 +A1:1998 +A2 :2003

Test Date

December 18, 2007

Test Location

Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Constant Voltage Constant Frequency	NewTech	CVCF 3 kW	4269	N/A

Test Specifications

Supply voltage max.: $U_{nom} + 10 \%$

Supply voltage min. : $U_{nom} - 10 \%$

U_{nom} = Nominal mains voltage (230 Vac)



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Test Data

☒ Input a.c. power ports

Mode of Application	Observation
Supply voltage max. (253 Vac)	No any function degraded
Supply voltage min. (207 Vac)	No any function degraded

Test Conditions: Temperature: 20 °C
 Relative Humidity: 30 %
 Atmospheric Pressure: 1004 mbar

Test Results

- ☒ MET Required Performance Criteria
☐ NOT MET Required Performance Criteria

Remarks

See above observations in tables.



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3.8 Mains Supply Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

December 18, 2007

Test Location

EMS-Voltage dip: Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Power Quality Test Systems	SCHAFFNER	ProfLine 2103	54350, 200048-202EK	2008-02-26

Test Specifications & Observations/Remarks

☒	<i>Voltage Dips and Short Interruptions</i>		
	<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Observation</u>
☒	0 %Ut (100 % dip)	☒ 0.5 /10 ☒ 1.0 /20 ☒ 5.0 /100 ☐ 10 /200 ☐ 25 /500 ☐ 50 /1000 ☐ 250 /5000	No any function degraded No any function degraded No any function degraded — — — —
☒	40 %Ut (60 % dip)	☒ 0.5 /10 ☒ 1.5 /30 ☐ 5.0 /100 ☒ 10 /200 ☐ 25 /500 ☐ 50 /1000	No any function degraded No any function degraded — No any function degraded — —
☒	70 %Ut (30 % dip)	☒ 0.5 /10 ☒ 1.5 /30 ☐ 5.0 /100 ☒ 10 /200 ☐ 25 /500 ☐ 50 /1000	No any function degraded No any function degraded — No any function degraded — —



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Test Conditions: Temperature: 20 °C
 Relative Humidity: 30 %
 Atmospheric Pressure: 1004 mbar

Test Results

- ☒ MET Required Performance Criteria
☐ NOT MET Required Performance Criteria

Remarks

See above observations in tables.

APPENDIX A - Test Setup Photos and Configuration

Conducted Voltage Emissions





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Radiated Electric Field Emissions





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Harmonic Current Emissions and Voltage Fluctuations and Flicker





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Electrostatic Discharge





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Radiated Electromagnetic Fields





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Fast Transients Bursts





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Slow High Energy Voltage Surge





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Conducted Disturbance





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Mains Supply Voltage Dips and Short Interruptions





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APPENDIX B – TEST DATA

Conducted Voltage Emissions

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
14.55	0.4	0.3	N	73.0	37.0	37.7	35.3	60.0	28.9	29.6	30.4
15.67	0.4	0.3	N	73.0	40.5	41.2	31.8	60.0	28.1	28.8	31.2
16.28	0.4	0.3	N	73.0	41.7	42.4	30.6	60.0	28.1	28.8	31.2
16.45	0.4	0.3	N	73.0	42.4	43.1	29.9	60.0	28.7	29.4	30.6
16.48	0.4	0.3	N	73.0	42.7	43.4	29.6	60.0	27.5	28.2	31.8
21.79	0.5	0.5	N	73.0	36.8	37.8	35.2	60.0	29.7	30.7	29.3

H : HOT, N : NEUTRAL



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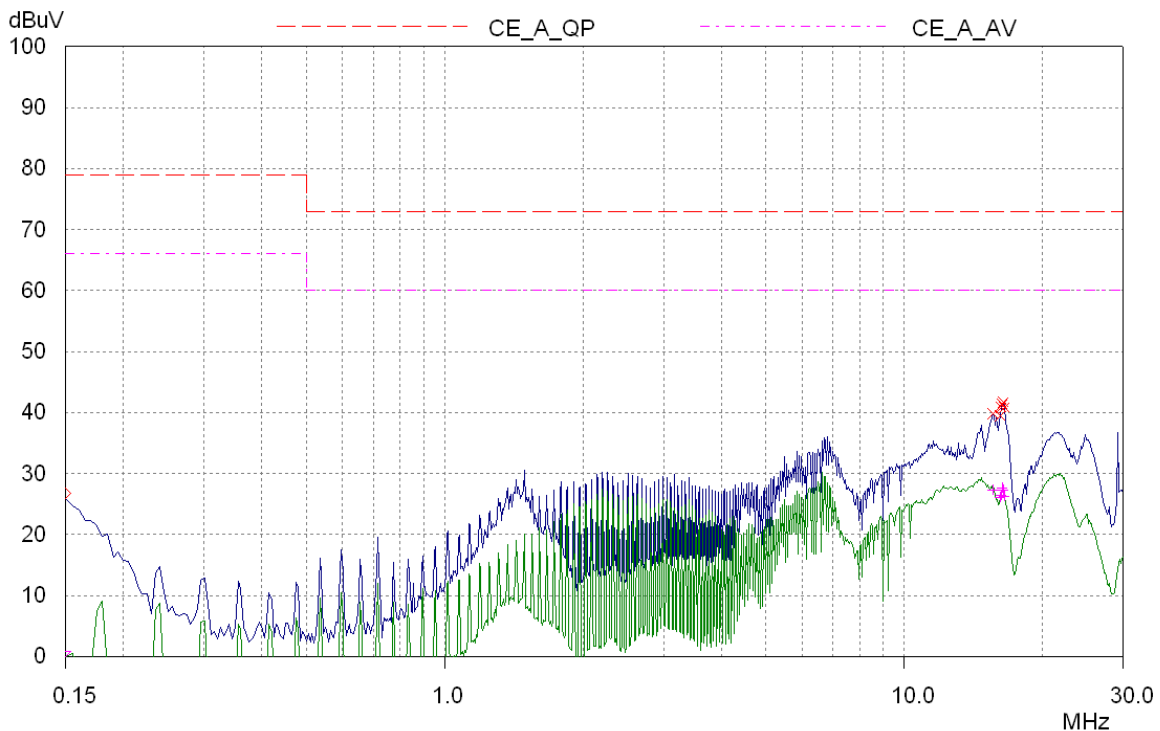
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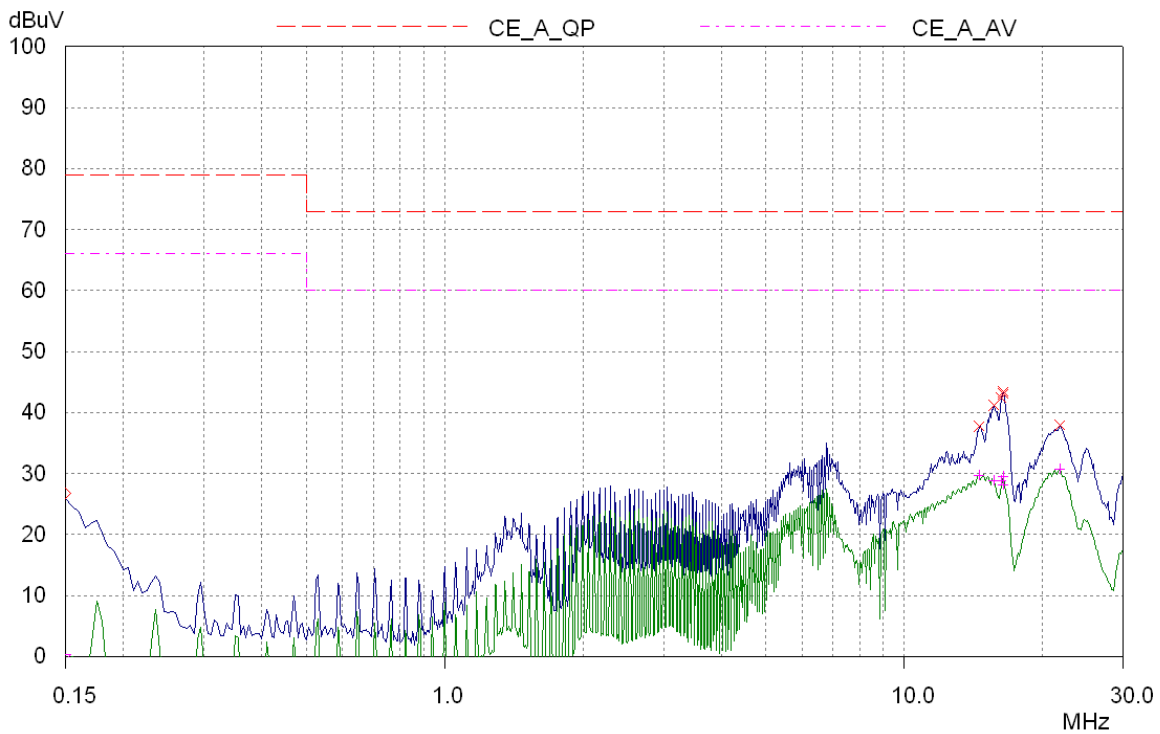
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[HOT]



[NEUTRAL]





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Frequency [MHz]	Reading [dBuV / m]	Pol.	Height [m]	Correction Factor		Limits [dBuV / m]	Result [dBuV / m]	Margin [dB]
				Antenna	Cable			
141.53	20.6	V	1.0	8.4	2.6	40.0	31.6	8.4
185.19	17.0	V	1.8	7.0	3.0	40.0	27.0	13.0
199.78	15.9	V	1.2	7.5	3.2	40.0	26.6	13.4
214.25	21.6	V	1.0	8.1	3.3	40.0	33.0	7.0
226.26	14.0	V	1.0	8.7	3.5	40.0	26.2	13.8
299.17	20.3	H	4.0	11.0	4.4	47.0	35.7	11.3

Test Report No.: 2005080028-4
Date: August 31, 2010

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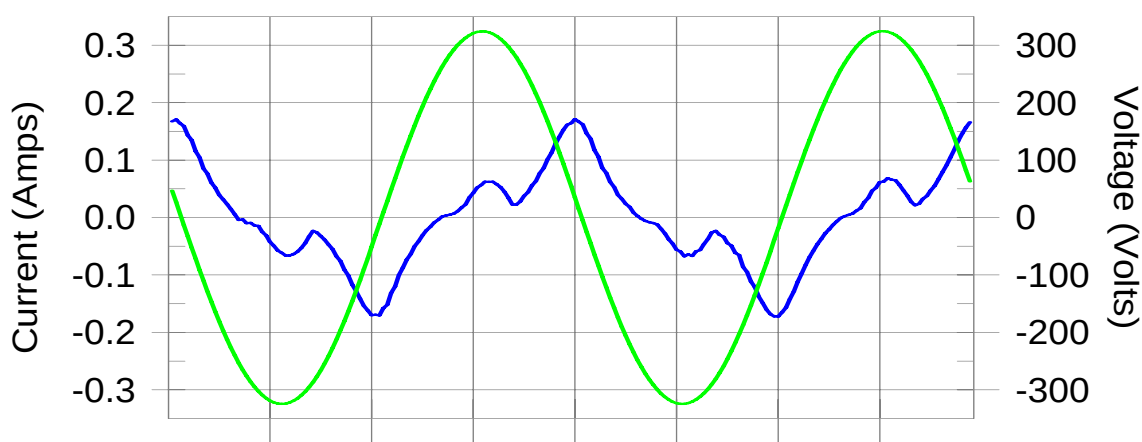
Harmonic Current Emissions and Voltage Fluctuations and Flicker

Harmonics – Class-A per A-14(Run time)

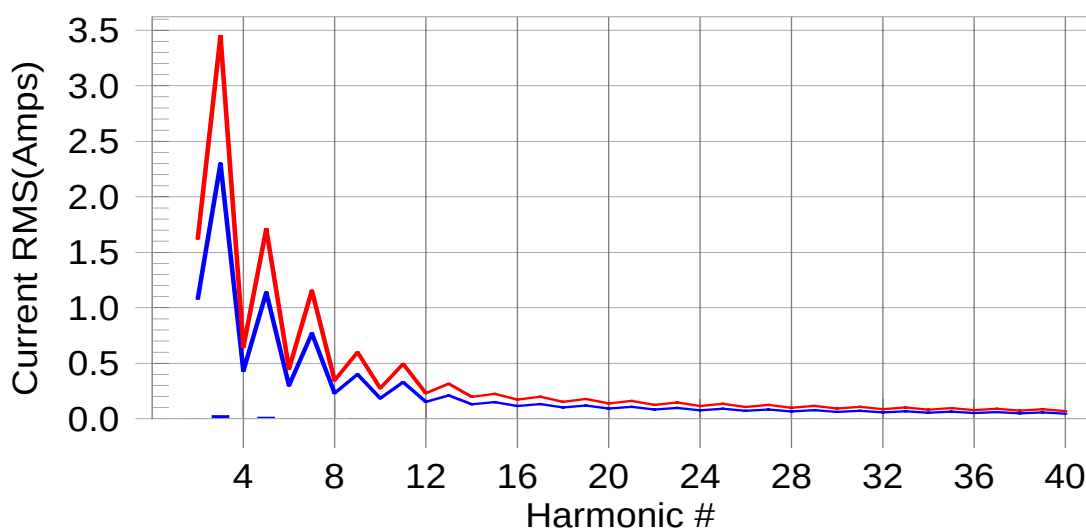
EUT: SDC-415PA

Test duration (min): 10

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #5 with 0.96% of the limit.



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Current Test Result Summary (Run time)

EUT: SDC-415PA

Test duration (min): 10

Highest parameter values during test:

V_RMS (Volts): 229.53

I_Peak (Amps): 0.190

I_Fund (Amps): 0.077

Power (Watts): 7

Frequency(Hz): 50.00

I_RMS (Amps): 0.085

Crest Factor: 2.231

Power Factor: 0.338

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000	1.080	0.0	0.000	1.620	0.01	Pass
3	0.031	2.300	1.3	0.031	3.450	0.90	Pass
4	0.000	0.430	0.0	0.000	0.645	0.01	Pass
5	0.016	1.140	1.4	0.016	1.710	0.96	Pass
6	0.000	0.300	0.1	0.000	0.450	0.07	Pass
7	0.002	0.770	0.3	0.002	1.155	0.17	Pass
8	0.000	0.230	0.0	0.000	0.345	0.01	Pass
9	0.003	0.400	0.9	0.004	0.600	0.59	Pass
10	0.000	0.184	0.0	0.000	0.276	0.01	Pass
11	0.001	0.330	0.2	0.001	0.495	0.13	Pass
12	0.000	0.153	0.1	0.000	0.230	0.08	Pass
13	0.001	0.210	0.4	0.001	0.315	0.26	Pass
14	0.000	0.131	0.0	0.000	0.197	0.02	Pass
15	0.001	0.150	0.6	0.001	0.225	0.39	Pass
16	0.000	0.115	0.0	0.000	0.173	0.03	Pass
17	0.000	0.132	0.2	0.000	0.199	0.15	Pass
18	0.000	0.102	0.1	0.000	0.153	0.07	Pass
19	0.000	0.118	0.3	0.000	0.178	0.19	Pass
20	0.000	0.092	0.0	0.000	0.138	0.02	Pass
21	0.000	0.107	0.3	0.000	0.161	0.21	Pass
22	0.000	0.084	0.0	0.000	0.125	0.02	Pass
23	0.000	0.098	0.2	0.000	0.147	0.15	Pass
24	0.000	0.077	0.1	0.000	0.115	0.06	Pass
25	0.000	0.090	0.2	0.000	0.135	0.12	Pass
26	0.000	0.071	0.0	0.000	0.106	0.04	Pass
27	0.000	0.083	0.2	0.000	0.125	0.15	Pass
28	0.000	0.066	0.1	0.000	0.099	0.07	Pass
29	0.000	0.078	0.2	0.000	0.116	0.13	Pass
30	0.000	0.061	0.2	0.000	0.092	0.15	Pass
31	0.000	0.073	0.1	0.000	0.109	0.07	Pass
32	0.000	0.058	0.1	0.000	0.086	0.08	Pass
33	0.000	0.068	0.2	0.000	0.102	0.13	Pass
34	0.000	0.054	0.0	0.000	0.081	0.05	Pass
35	0.000	0.064	0.1	0.000	0.096	0.11	Pass
36	0.000	0.051	0.1	0.000	0.077	0.06	Pass
37	0.000	0.061	0.1	0.000	0.091	0.08	Pass
38	0.000	0.048	0.1	0.000	0.073	0.07	Pass
39	0.000	0.058	0.1	0.000	0.087	0.07	Pass
40	0.000	0.046	0.1	0.000	0.069	0.05	Pass



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Voltage Source Verification Data (Run time)

EUT: SDC-415PA

Test duration (min): 10 Data file name: H-000336.cts_data

Highest parameter values during test:

Voltage (Vrms): 229.53	Frequency(Hz): 50.00
I_Peak (Amps): 0.190	I_RMS (Amps): 0.085
I_Fund (Amps): 0.077	Crest Factor: 2.231
Power (Watts): 7	Power Factor: 0.338

Harm #	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.096	0.459	20.82	OK
3	0.484	2.066	23.41	OK
4	0.021	0.459	4.51	OK
5	0.017	0.918	1.87	OK
6	0.021	0.459	4.56	OK
7	0.013	0.689	1.91	OK
8	0.020	0.459	4.38	OK
9	0.032	0.459	6.98	OK
10	0.014	0.459	2.97	OK
11	0.010	0.230	4.15	OK
12	0.016	0.230	6.89	OK
13	0.008	0.230	3.57	OK
14	0.012	0.230	5.07	OK
15	0.007	0.230	2.97	OK
16	0.018	0.230	7.70	OK
17	0.012	0.230	5.19	OK
18	0.023	0.230	9.81	OK
19	0.006	0.230	2.63	OK
20	0.019	0.230	8.31	OK
21	0.007	0.230	3.00	OK
22	0.009	0.230	3.94	OK
23	0.005	0.230	2.39	OK
24	0.007	0.230	2.87	OK
25	0.006	0.230	2.79	OK
26	0.008	0.230	3.37	OK
27	0.005	0.230	2.32	OK
28	0.006	0.230	2.52	OK
29	0.006	0.230	2.75	OK
30	0.008	0.230	3.70	OK
31	0.004	0.230	1.55	OK
32	0.005	0.230	2.05	OK
33	0.005	0.230	2.33	OK
34	0.003	0.230	1.20	OK
35	0.002	0.230	0.86	OK
36	0.003	0.230	1.46	OK
37	0.005	0.230	1.97	OK
38	0.002	0.230	1.03	OK
39	0.002	0.230	0.88	OK
40	0.012	0.230	5.44	OK



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

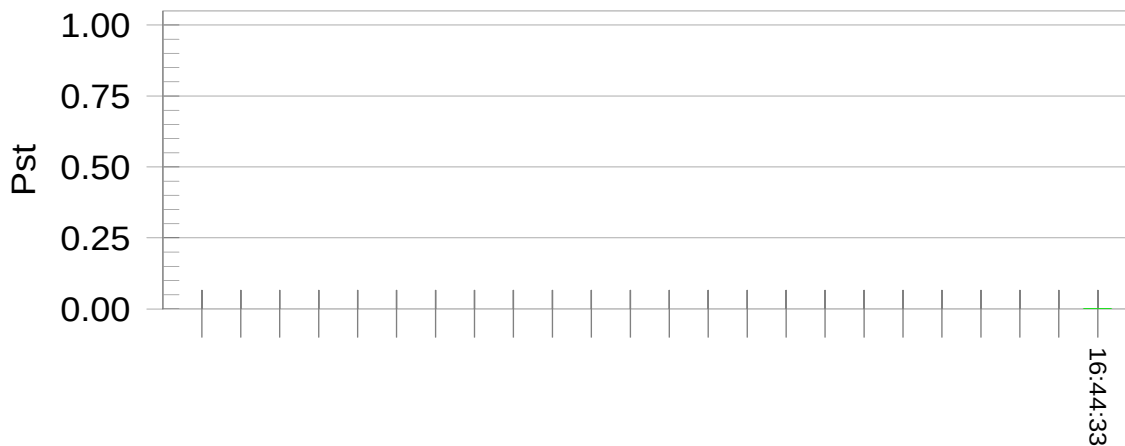
EUT: SDC-415PA

Test duration (min): 10

Test Result: Pass

Pst_i and limit line

European Limits



Time is too short for Plt plot

Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.47

Highest dt (%)	0.00	Test limit (%)	3.30	Pass
Time(mS) > dt	0.0	Test limit (mS)	500.0	Pass
Highest dc (%)	0.00	Test limit (%)	3.30	Pass
Highest dmax (%)	0.00	Test limit (%)	4.00	Pass
Highest Pst (10 min. period)	0.001	Test limit	1.000	Pass
Highest Plt (2 hr. period)	0.001	Test limit	0.650	Pass



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APPENDIX C – EUT Photographs



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EUT External Photographs





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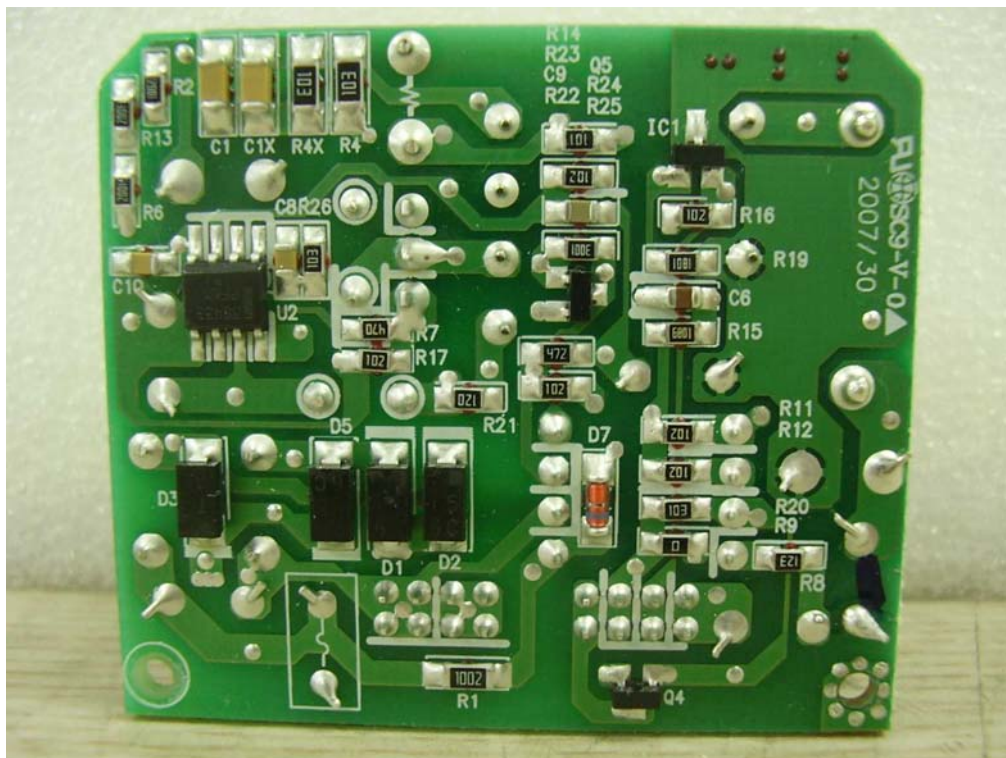
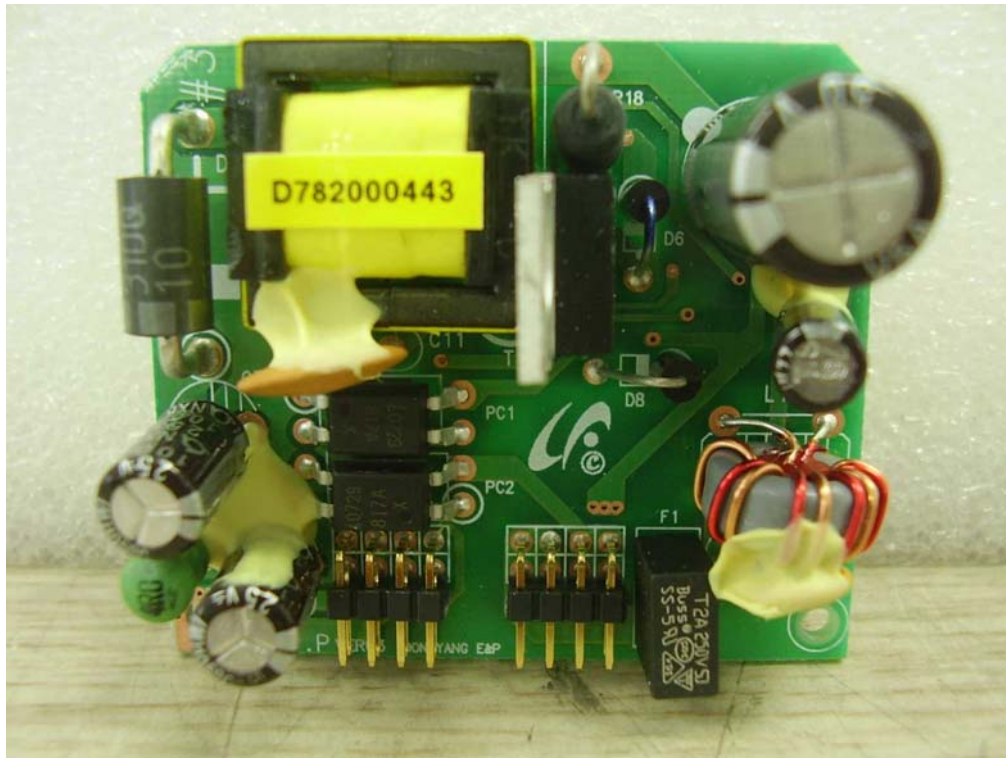
www.e-ctk.com



EUT Internal Photographs



PCB





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