

C E R T I F I C A T E
of Conformity
EC Council Directive 2004/108/EC
Electromagnetic Compatibility

Registration No.: AE 50271511 0001

Report No.: 50001605 001

Holder: LG Electronics Tianjin Appliances
Co., Ltd.
XingDian Road, Beichen district,
Tianjin 300402
P.R. China

Product: Air Conditioner
Split Type Room Air Conditioner

Identification: Type Designations: USNW126HxA0, USUW126HxA0
USNW096HxA0, USUW096HxA0
Z12SL.NSH, E12EL.NSH, E12EL.UA3
Z09SL.NSH, E09EL.NSH, E09EL.UA3
x = A - Z or 0 - 9

Serial Number: n.a. (prototype)

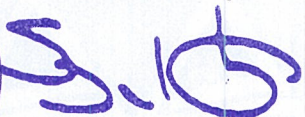
Tested acc. to: EN 61000-3-2:2006+A1+A2
EN 61000-3-3:2008
EN 55014-1:2006+A1+A2
EN 55014-2:1997+A1+A2

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2004/108/EC. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to the a.m. Directive.

Date 02.12.2013




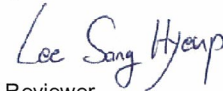
Certification Body



Sung-Won Hong

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may only be used if all relevant and effective EC Directives are complied with. CE

Prüfbericht - Nr.: <i>Test Report No.:</i>	50001605 001	Auftrags-Nr.: <i>Order No.:</i>	133035779	Seite 1 von 20 <i>Page 1 of 20</i>	
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	11.11.2013		
Auftraggeber: <i>Client:</i>	LG Electronics Tianjin Appliances Co., Ltd. XingDian Road, Beichen district, 300402 Tianjin, P.R. China				
Prüfgegenstand: <i>Test item:</i>	Split Type Room Air Conditioner				
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	USNW126HxA0, USUW126HxA0, USNW096HxA0, USUW096HxA0, Z12SL.NSH, E12EL.NSH, E12EL.UA3, Z09SL.NSH, E09EL.NSH, E09EL.UA3				
Auftrags-Inhalt: <i>Order content:</i>	Type Examination				
Prüfgrundlage: <i>Test specification:</i>	[Emission] EN 55014-1:2006+A1:2009+A2:2011 EN 61000-3-2:2006+A1:2009+A2:2009 EN 61000-3-3:2008 [Immunity] EN 55014-2:1997+A1:2001+A2:2008 (category IV) EN 61000-4-2:2009 (contact: level 2 ($\pm 4kV$), air: level 3 ($\pm 8kV$)) EN 61000-4-3:2006+A1:2008+A2:2010 ((80 - 1000)MHz, level 2 (3V/m)) EN 61000-4-4:2004+A1:2010 (AC power ports: level 2 ($\pm 1kV$), signal ports: level 2 ($\pm 0.5kV$)) EN 61000-4-5:2006 (AC power ports: class 3) EN 61000-4-6:2009 (AC power ports: level 2 (3V), signal ports: level 1 (1V)) EN 61000-4-11:2004				
Wareneingangsdatum: <i>Date of receipt:</i>	11.11.2013				
Prüfmuster-Nr.: <i>Test sample No.:</i>	N/A				
Prüfzeitraum: <i>Testing period:</i>	12.11.2013 - 20.11.2013				
Ort der Prüfung: <i>Place of testing:</i>	LG Electronics Inc., Home Appliance Company, EMC Center				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland Korea Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von / tested by:		kontrolliert von / reviewed by:			
02.12.2013 Jong-Man Kim / Inspector 		02.12.2013 Sang-Hyeup Lee / Reviewer 			
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other:					
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass)=entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m.test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested					
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark</i>					

v04

TEST SUMMARY

5.1.1 HARMONICS ON AC MAINS*RESULT: PASS***5.1.2 VOLTAGE FLUCTUATIONS ON AC MAINS***RESULT: PASS***5.1.3 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE***RESULT: PASS***5.1.4 CONTINUOUS DISTURBANCE VOLTAGE ON INTERCONNECTION LINES***RESULT: PASS***5.1.5 DISCONTINUOUS INTERFERENCE ON AC MAINS***RESULT: PASS***5.2.1 DISTURBANCE POWER***RESULT: PASS***6.1.1 RADIATED RADIO-FREQUENCY ELECTROMAGNETIC FIELDS (RS), AMPLITUDE MODULATION***RESULT: PASS***6.1.2 RADIO-FREQUENCY COMMON MODE / CONDUCTED SUSCEPTIBILITY (CS)***RESULT: PASS***6.2.1 ELECTRICAL FAST TRANSIENTS (EFT)***RESULT: PASS***6.2.2 SURGE***RESULT: PASS***6.2.3 ELECTROSTATIC DISCHARGES (ESD)***RESULT: PASS***6.3.1 VOLTAGE DIP AND INTERRUPTION***RESULT: PASS*

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1. General Remarks

Model USNW126H4A0 and USUW126H4A0 is worst condition, therefore tested representatively for the below mentioned series model.

Model differences:

Model USNW126HxA0 is indoor unit model name of air conditioner system.

Model USUW126HxA0 is outdoor unit model name of air conditioner system.

Model USNW096HxA0 is identical to model USNW126HxA0 except capacity.

Model USUW096HxA0 is identical to model USUW126HxA0 except capacity.

Models Z12SL.NSH and E12EL.NSH are identical to model USNW126HxA0 except model name.

Model E12EL.UA3 is identical to model USUW126HxA0 except model name.

Models Z09SL.NSH and E09EL.NSH are identical to model USNW096HxA0 except model name.

Model E09EL.UA3 is identical to model USUW096HxA0 except model name.

x stands for A to Z or 0 to 9: cosmetic design

1.1 Complementary Materials

All attachments are integral parts of this test report.

This applies especially to the following test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

2. Test Sites

2.1 Test Facilities

LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

This test site is in accordance with CISPR 16 for measurement of radio interference.

The used test equipment is in accordance with CISPR 16 for measurement of radio interference. The tests at the manufacturer's premises have been conducted by a TÜV testing engineer.

2.2 List of Test and Measurement Instruments

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

3. General Product Information

3.1 Product Function and Intended Use

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

3.2 Ratings and System Details

System Input Voltage:	AC 220-240V
Frequency:	50Hz
Input Power:	1120 W, 4.9 A : Cooling mode 1040 W, 4.6 A : Heating mode
Protection Class:	I

Test Voltage:	As required for each test item.
Test Frequency:	As required for each test item.

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

3.3 Independent Operation Modes

The basic operation modes are:

- A. Cooling mode
- B. Heating mode

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

3.4 Noise Generating and Noise Suppressing Parts

Nothing mentioned explicitly.

3.5 Submitted Documents

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Immunity: The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Physical Configuration for Testing

Refer to section: Photographs of the Test Set-Up

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

4.3 Test Operation and Test Software

Software version used for testing:

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

4.4 Special Accessories and Auxiliary Equipment

Nothing mentioned explicitly.

4.5 Countermeasures to achieve EMC Compliance

No additional measures were employed to achieve compliance.

5. Test Results EMISSION

5.1 Emission in the Frequency Range up to 30 MHz

5.1.1 Harmonics on AC Mains

RESULT: **PASS**

Date of testing: 12.11.2013

Test procedure: EN 61000-3-2:2006+A1:2009+A2:2009
Equipment classification: (class A)

Refer to the attached test reports:
13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

5.1.2 Voltage Fluctuations on AC Mains

RESULT: **PASS**

Date of testing: 12.11.2013

Test procedure: EN 61000-3-3:2008
Frequency range: (0 - 2)kHz

Refer to the attached test reports:
13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

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5.1.3 Mains Terminal Continuous Disturbance Voltage

RESULT: PASS

Date of testing: 12.11.2013

Test procedure: EN 55014-1:2006+A1:2009+A2:2011

Frequency range: (0.15 - 30)MHz

Kind of test site: Shielded Room

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

5.1.4 Continuous Disturbance Voltage on Interconnection Lines

RESULT: PASS

Date of testing: 12.11.2013

Test procedure: EN 55014-1:2006+A1:2009+A2:2011

Frequency range: (0.15 - 30)MHz

Kind of test site: Shielded Room

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

5.1.5 Discontinuous Interference on AC Mains

RESULT:**PASS**

Date of testing: 12.11.2013

Test procedure: EN 55014-1:2006+A1:2009+A2:2011
Frequency range: (0.15 - 30)MHz
Kind of test site: Shielded Room
EUT category: According table A.1 of annex A
Factor f according table A.2: 1

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

5.2 Emission in the Frequency Range above 30 MHz

5.2.1 Disturbance Power

RESULT:**PASS**

Date of testing: 12.11.2013

Test procedure: EN 55014-1:2006+A1:2009+A2:2011
Frequency range: (30 - 300)MHz
Kind of test site: Shielded Room

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

6. Test Results IMMUNITY

6.1 Continuous Disturbances

6.1.1 Radiated Radio-frequency Electromagnetic Fields (RS), Amplitude Modulation

RESULT: **PASS**

Date of testing:	19.11.2013
Reference standard:	EN 55014-2:1997+A1:2001+A2:2008
Test procedure:	EN 61000-4-3:2006+A1:2008+A2:2010
Frequency range:	(80 - 1000)MHz
Test level:	2 (3V/m) (unmodulated, rms.)
Modulation:	80% AM, 1kHz
Performance criterion:	A

Refer to the attached test reports:

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

6.1.2 Radio-frequency Common Mode / Conducted Susceptibility (CS)**RESULT: PASS**

Date of testing: 20.11.2013

Reference standard: EN 55014-2:1997+A1:2001+A2:2008
Test procedure: EN 61000-4-6:2009
Severity level: 2 (3V) for AC power ports (unmodulated, rms.)
1 (1V) for signal ports (unmodulated, rms.)

Source impedance: 150Ω
Frequency range: 150kHz - 80MHz
Modulation: AM 80%, 1kHz sine-wave
Sweep mode: Automatic
Sweep rate: 1%, 3s dwell time

Performance criterion: A

Refer to the attached test reports:
13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

6.2 Transient Disturbances

6.2.1 Electrical Fast Transients (EFT)

RESULT:**PASS**

Date of testing:	20.11.2013
Reference standard:	EN 55014-2:1997+A1:2001+A2:2008
Test procedure:	EN 61000-4-4:2004+A1:2010
Severity level:	2 (± 1 kV) for AC power ports 2 (± 0.5 kV) for signal ports
Test duration:	≥ 120 s
Performance criterion:	B

Refer to the attached test reports:

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

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6.2.2 Surge

RESULT:**PASS**

Date of testing:	20.11.2013
Reference standard:	EN 55014-2:1997+A1:2001+A2:2008
Test procedure:	EN 61000-4-5:2006
Installation class:	3 for AC power ports
Source impedance:	2Ω, 12Ω
Test voltages:	±1kV, ±2kV
Coupling phases:	0, $\pi/2$, π , $3\pi/2$, (0°, 90°, 180°, 270°) Asynchron
Number of surges:	5 (for each parameter combination)
Repetition rate:	max. 1/min.
Performance criterion:	B

Refer to the attached test reports:

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

Prüfbericht - Nr.: 50001605 001
*Test Report No.:***Seite 18 von 20**
*Page 18 of 20***6.2.3 Electrostatic Discharges (ESD)****RESULT:****PASS**

Date of testing:	19.11.2013
Reference standard:	EN 55014-2:1997+A1:2001+A2:2008
Test procedure:	EN 61000-4-2:2009
Severity level:	2 (± 4 kV) (contact discharge) 3 (± 8 kV) (air discharge)
Number of discharges:	>10
Performance criterion:	B

Refer to the attached test reports:
13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

6.3 Power Supply Alterations

6.3.1 Voltage Dip and Interruption

RESULT:**PASS**

Date of testing:	20.11.2013
Reference standard:	EN 55014-2:1997+A1:2001+A2:2008
Test procedure:	EN 61000-4-11:2004
Test parameters:	-30%, 25 periods, 500ms @ 50Hz, performance criterion: C -60%, 10 periods, 200ms @ 50Hz, performance criterion: C -100%, 0.5 periods, 10ms @ 50Hz performance criterion: C

Refer to the attached test reports:

13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center,
391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of
Korea

7. Photographs of the Test Set-Up

Refer to the attached test reports:

13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

13-EAEU-0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

8. Attachment: Test Report 13-EAEU-0281 B/I of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

35 pages following

9. Attachment: Test Report 13-EAEU-A0281 B/S of LG Electronics Inc., Home Appliance Company, EMC Center, 391-2, Gaeumjeong-dong, Changwon, Gyeongsangnam-do, 641-711, Republic of Korea

26 pages following

EMC EMISSION - TEST REPORT

Test report file No. : **13-EAEU-0281 B/I** Date of Issue : November 29, 2013
Date of receipt of EUT : November 11, 2013

Indoor unit : USNW126HxA0, Z12SL.NSH, E12EL.NSH,
USNW096HxA0, Z09SL.NSH, E09EL.NSH

Model / Serial No. : Outdoor unit : USUW126HxA0, E12EL.UA3,
USUW096HxA0, E09EL.UA3
(See "Page 4" – 4. EUT)

Product Type : Room Air Conditioner

Applicant : Air conditioning & Energy solution Company, LG Electronics Inc.

Manufacturer : 1. Air conditioning & Energy solution Company, LG Electronics Inc.
2. LG Electronics Tianjin Appliance Co., Ltd.

Address : 1. 76, Seongsan Dong, Seongsan Gu, Changwon City, Gyeong Nam,
642-713, Korea
2. No. 9 Jin Wei Road, Bei Chen Dist, Tianjin, China

Test Result : **Positive (Pass)** **Negative (Fail)**

This test report with appendix consists of **35** pages.

The test result only responds to the tested sample (SN: N/A)

It is not allowed to copy this report even partly without the written permission of the Test Laboratory.

Tested by:



Shin Seung Ho / Research Engineer
Home Appliance Company, EMC Center
LG Electronics Inc.

Reviewed by:



Dae-Woong Kim / Chief Research Engineer
Home Appliance Company, EMC Center
LG Electronics Inc.

1. DIRECTORY

1-1. Documentation

	Pages
Test Report	1 – 35
Directory / Summary / Test Regulations	2 – 3
Informations on EUT	4 – 5
Summary of Test Results	6
Test Configuration and Setup	7 – 34
Constructional Data Form	35

1-2. Test Data

Conducted Emissions	150 kHz – 30 MHz	7 – 14
Interference Power	30 MHz – 300 MHz	15 – 20
Discontinuous Interference	150 kHz, 500 kHz, 1.4 MHz, 30 MHz	21 – 24
Harmonic Current Emissions	2nd through 40th Harmonics	25 – 31
Voltage Changes, Fluctuations and Flicker		32 – 34

2. SUMMARY

All tests according to the regulations cited on page 3 were

- Performed

- **Not** Performed

The Equipment Under Test

- **Fulfills** the standard selected on page 3.

- **Does not** fulfill the standard selected on page 3.

Testing Start Date : November 12, 2013 Testing End Date : November 12, 2013

3. EMISSIONS TEST REGULATIONS

The emissions tests were performed according to the following regulations:

EN Standard	CISPR Standard
<input type="checkbox"/> - EN 55011/2009 + A1/2010	CISPR 11 <input type="checkbox"/> - Group 1 <input type="checkbox"/> - Group 2 <input type="checkbox"/> - Class A <input type="checkbox"/> - Class B
<input checked="" type="checkbox"/> - EN 55014-1/2006 + A1/2009 + A2/2011	CISPR 14-1 <input checked="" type="checkbox"/> - Household appliances and similar <input type="checkbox"/> - Semiconductor devices
<input checked="" type="checkbox"/> - EN 61000-3-2/2006 + A1/2009 + A2/2009	
<input checked="" type="checkbox"/> - EN 61000-3-3/2008	
<input type="checkbox"/> - EN 61000-3-11/2000	
<input type="checkbox"/> - EN 61000-3-12/2011	

4. Equipment Under Test (EUT):

Model No. Information

Indoor unit : USNW126HxA0, Z12SL NSH, E12EL NSH,
USNW096HxA0, Z09SL.NSH, E09EL.NSH
Outdoor unit : USUW126HxA0, E12EL.UA3,
USUW096HxA0, E09EL.UA3

1. The “x” in model name denotes the cosmetic design and designated as A~Z or 0~9.

Model Z12/09SL & E12/09EL is buyer model name of USNW126/096.

Model E12/09EL is buyer model name of USUW126/096.

Model US-W126H4A0 (Combination of indoor and outdoor) is worst condition for EMC characteristics.
So we tested the “US-W126H4A0” as a representative model.

The equipment under test was operated under the following conditions during emissions testing:

Operating Mode	Power Consumption	Remarks
Cooling mode	1,120 W, 4.9 A	
Heating mode	1,040 W, 4.6 A	

Information about the EUT

Component	Model Name	Remarks
Compressor	GA102MDB	LG Electronics
Motor (Outdoor Unit)	EAU57945702	Shibaura or SCD or Panasonic or Ohsung or SPG or Matsushita
Motor (Indoor Unit)	4681A20091K or 4681A20091U or 4681A20091P	Shibaura or SCD or Panasonic or LG or Ohsung or WELLING
Refrigerant	R410A	0.9 kg

EUT Type

Room Air Conditioner

5. Configuration of the equipment under test:

The following peripheral devices and interface cables were connected during the testing:

- _____ Type: _____
 - _____ Type: _____

- Unshielded power cable : 1 Phase, Three line (L1-N-G)

- Unshielded cables

- Shielded cables :

- Customer specific cables

- _____

- Test condition: Cooling and Heating mode.

6. Environmental Conditions In The Laboratory:

	Actual
Temperature	: <u>24 ~ 26</u> °C
Relative Humidity	: <u>40 ~ 50</u> %
Atmospheric Pressure	: <u>1014 ~ 1016</u> mbar

7. Power Supply Utilized:

Power supply system : 220 ~ 240 Vac / 50 Hz / 1 Phase

8. Summary Of Test Results:

Conducted Emissions, 150 kHz - 30 MHz

- PASS

- FAIL

- NOT APPLICABLE

Minimum limit margin	-4.4	dB	at	0.678	MHz
Maximum limit exceeding	-	dB	at	-	MHz

Remarks: _____

Interference Power at the Mains and Interface Cables, 30 MHz - 300 MHz

- PASS

- FAIL

- NOT APPLICABLE

Minimum limit margin	-4.5	dB	at	62.9	MHz
Maximum limit exceeding	-	dB	at	-	MHz

Remarks: All emission readings from the equipment are lower than the applicable limits reduced by margin according to the Table 2b of the EN 55014-1:2006+A1:2009+A2:2011 and maximum clock frequency is less than 30 MHz.
The test equipment is deemed to comply in the frequency range from 300 MHz to 1000 MHz according to the clause 4.1.2.3.2 of the EN 55014-1:2006+A1:2009+A2:2011.

Discontinuous Interference

- PASS

- FAIL

- NOT APPLICABLE

Remarks: _____

Harmonic Current Emissions

- PASS

- FAIL

- NOT APPLICABLE

Remarks: _____

Voltage Changes, Fluctuations and Flicker

- PASS

- FAIL

- NOT APPLICABLE

Remarks: _____

9. Test Results:

9-1. Conducted Emissions (Disturbance Voltage)

The *Conducted Emissions (Disturbance Voltage)* measurements were performed at the following test location:

- Test not applicable

- Test Area No. 2 - Shielded room No. 1

9-1-1. Test Configurations

The distance between the enclosure of the EUT and the nearest surface of the LISN was 0.8 m.
The power cord was bundled to a length between 0.3 m and 0.4 m.
The emission measurements were done with supply voltage of **264** Vac. At 160 kHz for the disturbance voltage, the highest level was found for the above mentioned supply voltage.

9-1-2. Environmental Conditions in the Laboratory

	Actual	
Temperature	: 24 ~ 26	°C
Relative Humidity	: 40 ~ 42	%
Atmospheric Pressure	: 1014 ~ 1015	Mbar

9-1-3. Test Equipments

Model Number	Manufacturer	Description	Serial Number
■ - ESIB7	Rohde & Schwarz	EMI Test Receiver	100090
□ - ESCS30	Rohde & Schwarz	EMI Test Receiver	100232
■ - ESH2-Z5	Rohde & Schwarz	LISN	100081
□ - ENV4200	Rohde & Schwarz	LISN	100029
■ - ESH3-Z2	Rohde & Schwarz	Pulse Limiter	100058
■ - ESH2-Z3	Rohde & Schwarz	Passive Probe	100025
* Software version:	ESIB7 Firmware version 3.3 ESCS30 Firmware version 2.01		

9-1-4. Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above-mentioned way.

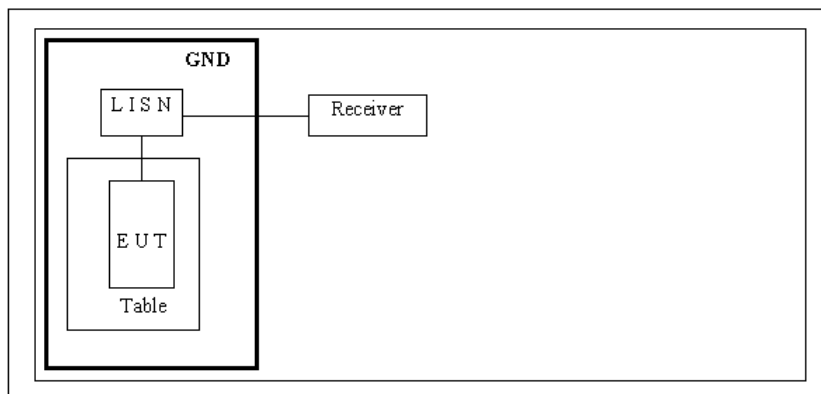
Measurement uncertainty is calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty is given with a confidence of 95 %

Contribution	Estimated Uncertainty dB	Probability Distribution	Coverage Factor k	Standard Uncertainty $u_i(y)$
Receiver Specification				
Input power level accuracy	0.95	Normal	2.0	0.48
Frequency response	0.10	Normal	2.0	0.05
Attenuation AMN-receiver	1.00	Normal	2.0	0.50
AMN Voltage division factor(Insertion loss)	0.09	Normal	2.0	0.05
AMN Impedance	0.60	Triangular	$\sqrt{6}$	0.24
Receiver Reading	0.10	Rectangular	$\sqrt{3}$	0.06
Mismatch	0.75	U-Shaped	$\sqrt{2}$	0.53
Receiver VRC: $\Gamma_1 = 0.09$ AMN+Cable VRC: $\Gamma_g = 1.0$ Uncertainty limits $20\log(1 \pm \Gamma_1 \Gamma_g)$	-0.82			-0.58
Measurement System Repeatability	0.50	Normal	1.0	0.50
Combined Standard Uncertainty		Normal		1.0 -1.1
Expanded Uncertainty		Normal k=2.0		2.1 -2.1

9-1-5. Test Date: November 12, 2013

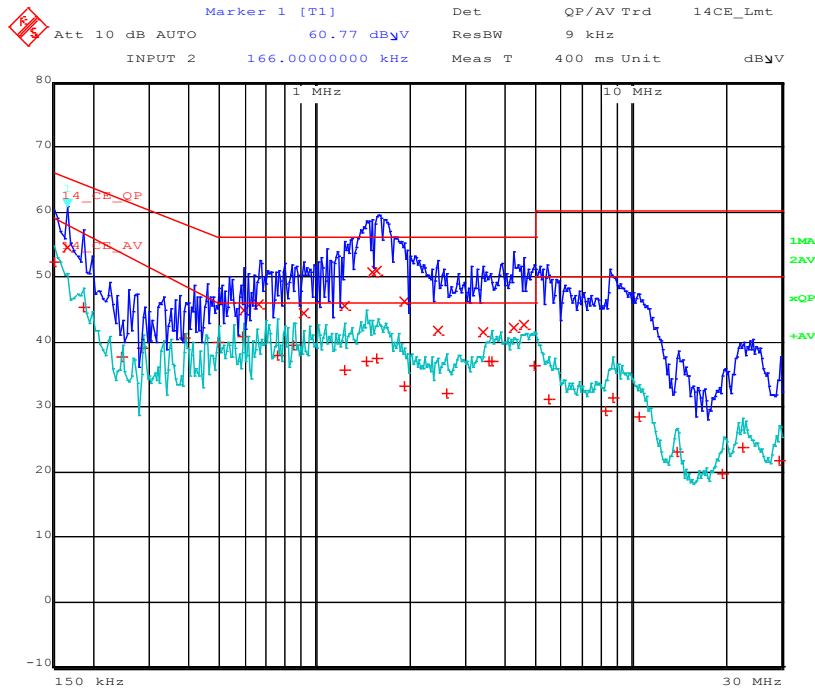
9-1-6. Test Setup



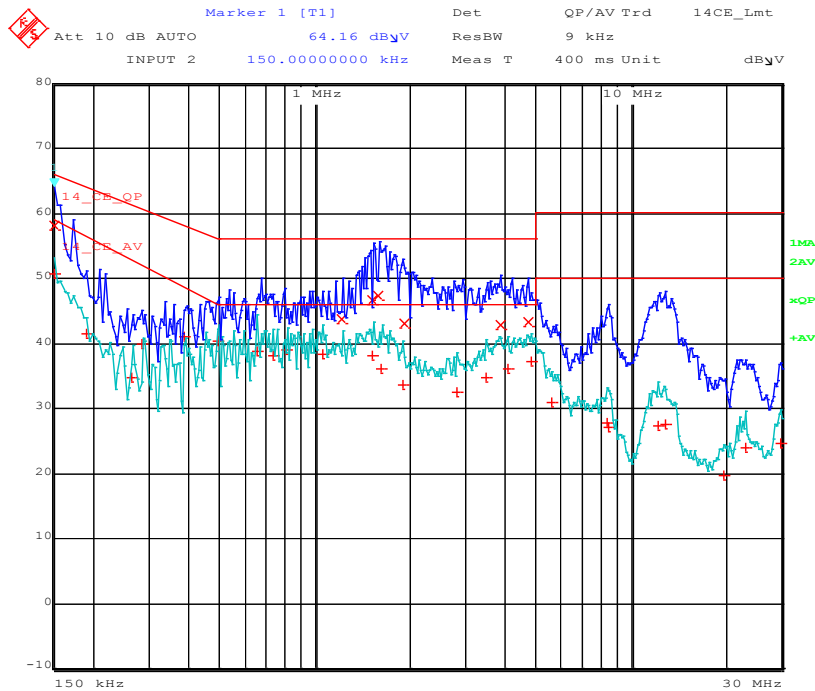
Test setup: Conducted emissions 0.15 MHz - 30 MHz

9-1-7. Test Graph

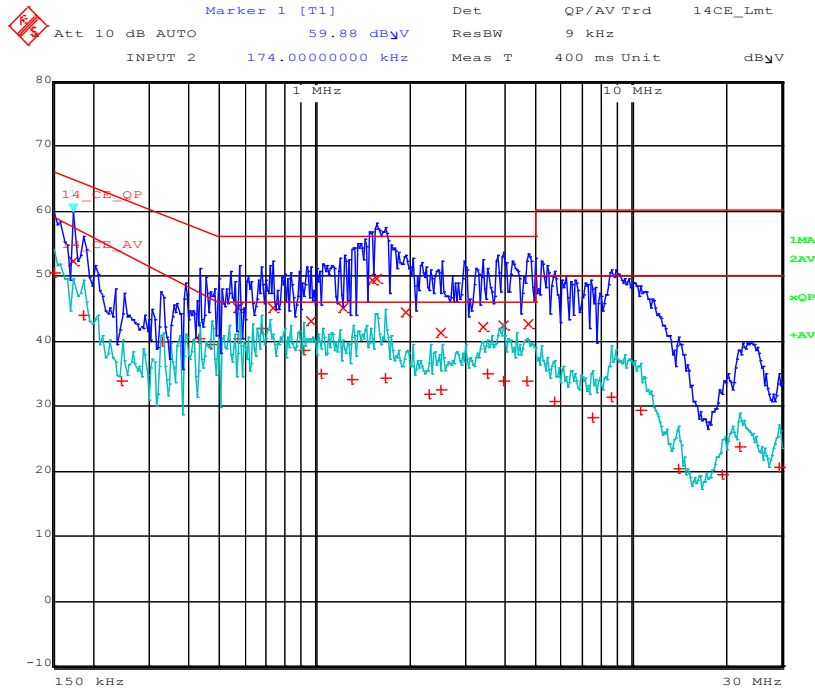
1) L1 Line (Cooling mode)



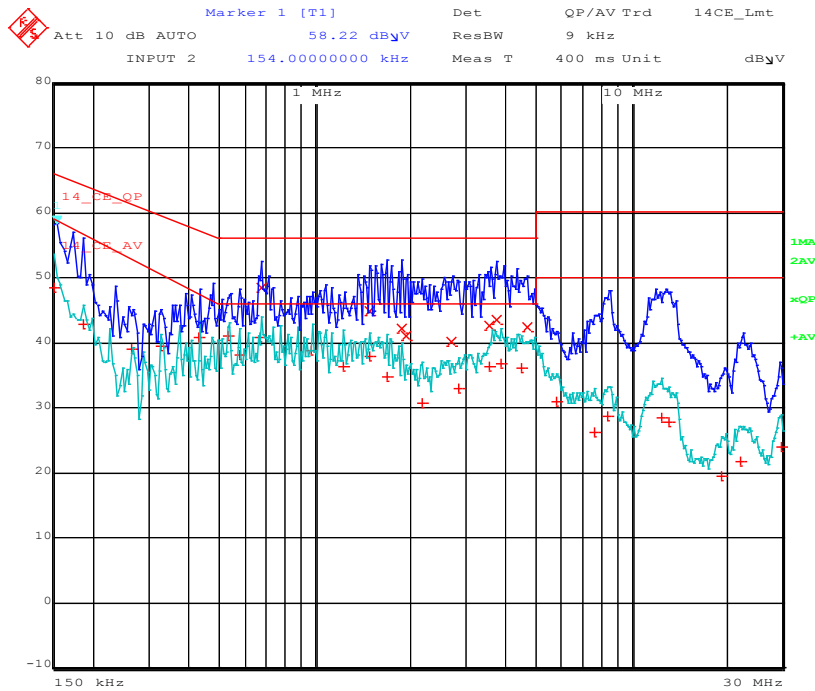
2) N Line (Cooling mode)



3) L1 Line (Heating mode)



4) N Line (Heating mode)



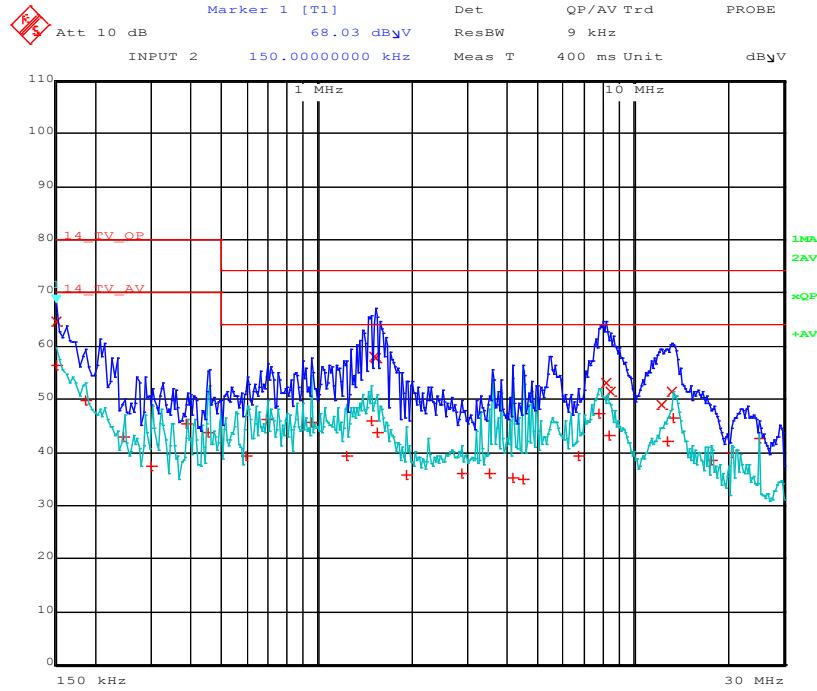
9-1-8. Test Data

Frequency [MHz]	Quasi-Peak			Average			Remark
	Disturbance Level [dBuV]	Permitted Limit [dBuV]	Margin [dB]	Disturbance Level [dBuV]	Permitted Limit [dBuV]	Margin [dB]	
Fundamental frequencies:							
0.16	56.2	65.5	-9.3	47.3	58.3	-11.0	Heating, L1 line
0.24	<<	62.1	<<	<<	53.9	<<	All mode
0.55	44.3	56.0	-11.7	38.9	46.0	-7.1	Cooling, N line
1.00	44.9	56.0	-11.1	35.9	46.0	-10.1	Cooling, L1 line
1.40	47.9	56.0	-8.1	36.3	46.0	-9.7	Cooling, L1 line
2.00	44.9	56.0	-11.1	31.8	46.0	-14.2	Cooling, L1 line
3.50	42.1	56.0	-13.9	34.7	46.0	-11.3	Cooling, L1 line
6.00	39.4	60.0	-20.6	30.8	50.0	-19.2	Heating, L1 line
10.00	40.2	60.0	-19.8	31.0	50.0	-19.0	Heating, L1 line
22.00	<<	60.0	<<	<<	50.0	<<	All mode
30.00	<<	60.0	<<	<<	50.0	<<	All mode
Other frequencies:							
0.150	59.5	66.0	-6.5	50.3	59.0	-8.7	Heating, L1 line
0.678	48.2	56.0	-7.8	41.6	46.0	-4.4	Heating, N line
1.582	50.6	56.0	-5.4	36.9	46.0	-9.1	Cooling, L1 line
5.106	41.3	60.0	-18.7	34.8	50.0	-15.2	Cooling, N line

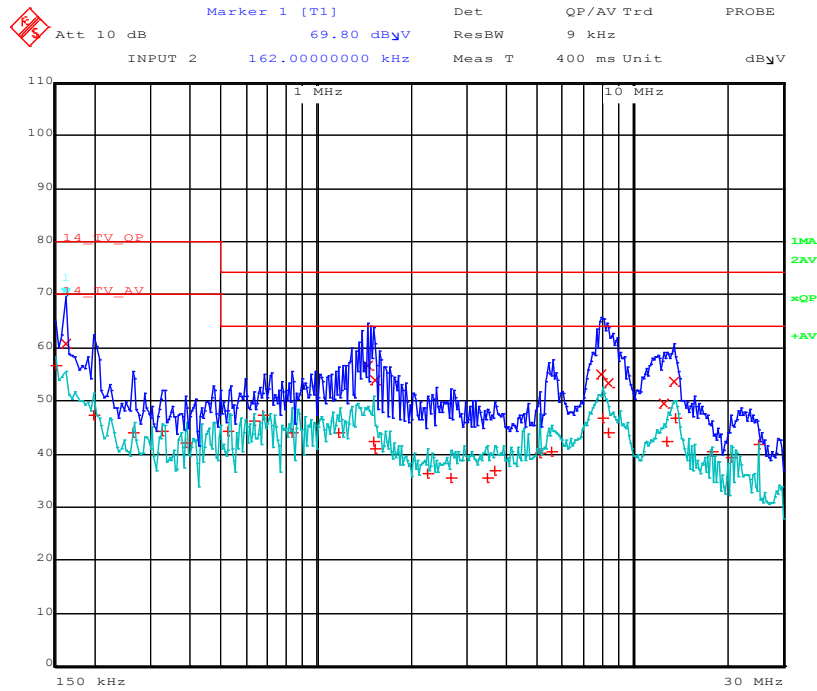
'<<' means that the disturbance voltage level is lower than 20 dB below the limit.
The measured value included and revised all related factor (LISN attenuation, Cable loss).

9-1-9. Test Graph (Terminal Voltage)

1) Signal line (Cooling mode)



2) Signal line (Heating mode)



9-1-10. Test Data (Terminal Voltage)

Frequency [MHz]	Quasi-Peak			Average			Remark
	Disturbance Level [dBuV]	Permitted Limit [dBuV]	Margin [dB]	Disturbance Level [dBuV]	Permitted Limit [dBuV]	Margin [dB]	
Fundamental frequencies:							
0.16	60.9	80.0	-19.1	52.6	70.0	-17.4	Cooling mode
0.24	<<	80.0	<<	<<	70.0	<<	All mode
0.55	<<	74.0	<<	<<	64.0	<<	All mode
1.00	<<	74.0	<<	<<	64.0	<<	All mode
1.40	54.5	74.0	-19.5	43.4	64.0	-20.6	Heating mode
2.00	<<	74.0	<<	<<	64.0	<<	All mode
3.50	<<	74.0	<<	<<	64.0	<<	All mode
6.00	<<	74.0	<<	<<	64.0	<<	All mode
10.00	<<	74.0	<<	<<	64.0	<<	All mode
22.00	<<	74.0	<<	<<	64.0	<<	All mode
30.00	<<	74.0	<<	<<	64.0	<<	All mode
Other frequencies:							
0.150	64.4	80.0	-15.6	57.7	70.0	-12.3	Heating mode
1.534	57.7	74.0	-16.3	46.1	64.0	-17.9	Cooling mode
7.910	55.4	74.0	-18.6	47.6	64.0	-16.4	Heating mode

'<<' means that the disturbance voltage level is lower than 20 dB below the limit.
The measured value included and revised all related factor (Passive Probe attenuation).

9-2. Disturbance Power

The *Disturbance Power* measurements were performed by using the absorbing clamp on the Main power and Signal line in the frequency range 30 MHz - 300 MHz at the following test location:

- Test not applicable

- Test Area No. 2 – Shielded room No. 1

9-2-1. Test Configurations

A pre-measurement was done with a spectrum analyzer to find the frequencies with the highest Interference. The absorbing clamp was moved along the power line with the spectrum analyzer in peak hold mode. The final measurement was done with a quasi-peak detector. The absorbing clamp was moved to maximize interference. The emission measurements were done with supply voltage of **264** Vac. At 50 MHz for the disturbance power, the highest level was found for the above mentioned supply voltage.

9-2-2. Environmental Conditions in the Laboratory

		Actual	
Temperature	:	24 ~ 26	°C
Relative Humidity	:	40 ~ 42	%
Atmospheric Pressure	:	1014 ~ 1016	mBar

9-2-3. Test Equipments

Model Number	Manufacturer	Description	Serial Number
■ - MDS-21	Rohde & Schwarz	Absorbing Clamp (Decoupling)	100100
■ - MDS-21	Rohde & Schwarz	Absorbing Clamp (Coupling)	100101
■ - ESIB7	Rohde & Schwarz	EMI Test Receiver	100090
□ - ESCS30	Rohde & Schwarz	EMI Test Receiver	100232
* Software version:	ESCS30 Firmware version 2.01		

9-2-4. Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above-mentioned way.

Measurement uncertainty is calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty is given with a confidence of 95 %

Contribution	Estimated Uncertainty dB	Probability Distribution	Coverage Factor k	Standard Uncertainty $u_i(y)$
Receiver Specification	1.00	Rectangular	$\sqrt{3}$	0.58
Receiver Reading	0.10	Rectangular	$\sqrt{3}$	0.06
Absorbing Clamp	2.00	Normal	2.0	1.00
Mismatch	0.75	U-Shaped	$\sqrt{2}$	0.53
Receiver VRC: $\Gamma_1 = 0.09$ Absorbing Clamp VRC: $\Gamma_g = 1.0$ Uncertainty limits $20\log(1 \pm \Gamma_1 \Gamma_g)$	-0.82			-0.58
Measurement System Repeatability	0.50	Normal	1.0	0.50
Combined Standard Uncertainty		Normal		1.4 -1.4
Expanded Uncertainty		Normal k=2.0		2.7 -2.8

9-2-5. Test Date: November 12, 2013

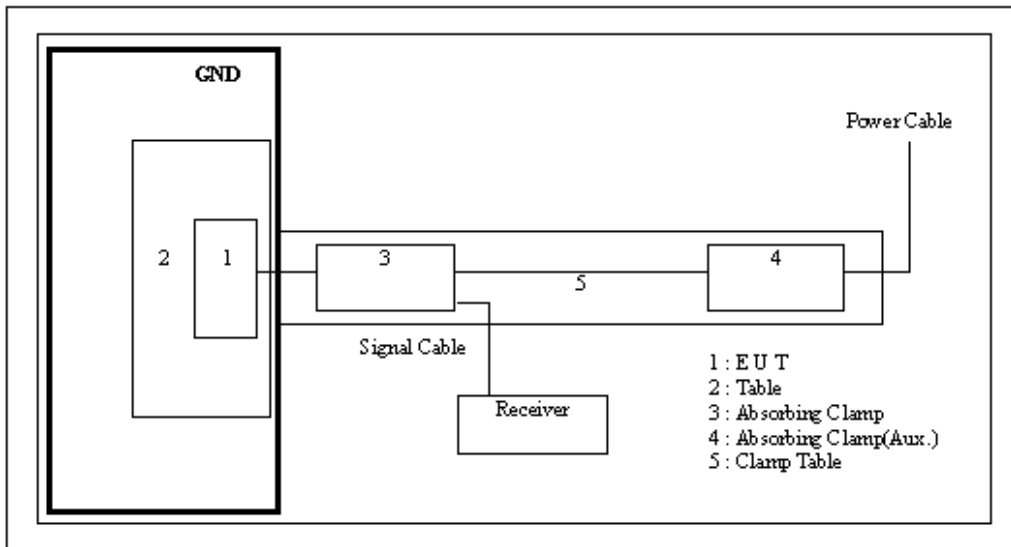
9-2-6. Test Setup



Main line



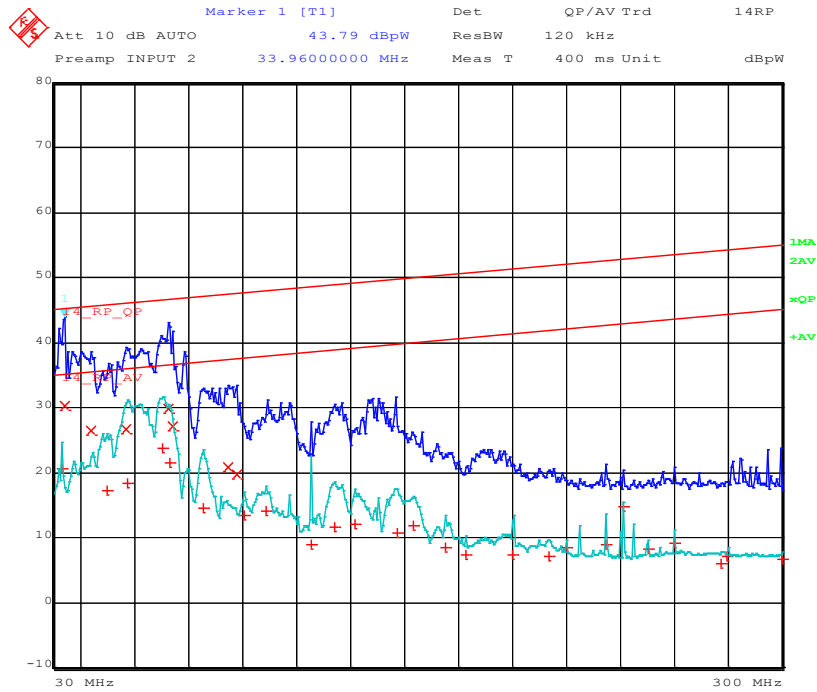
Signal line



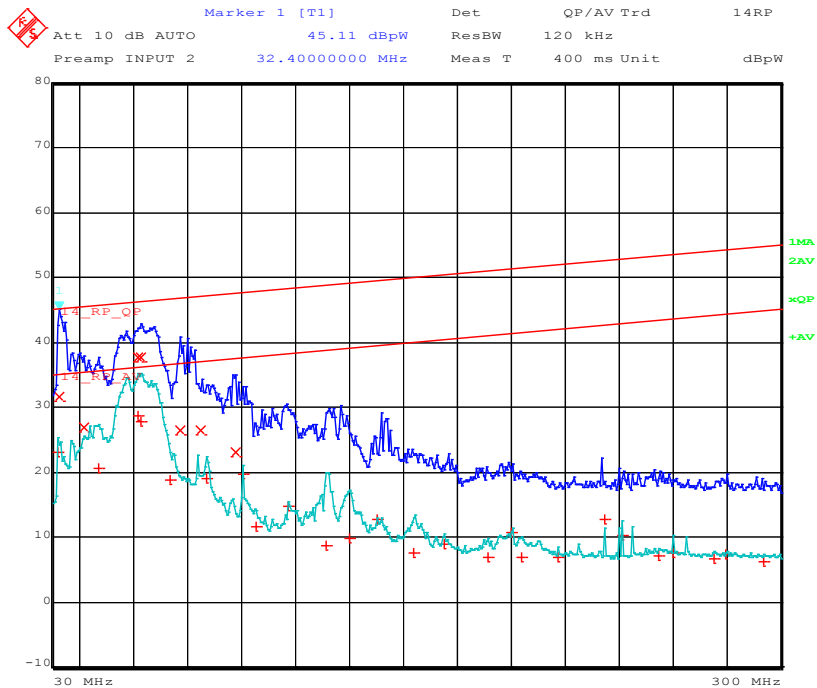
Test setup: Interference power emissions 30 MHz - 300 MHz

9-2-7. Test Graph

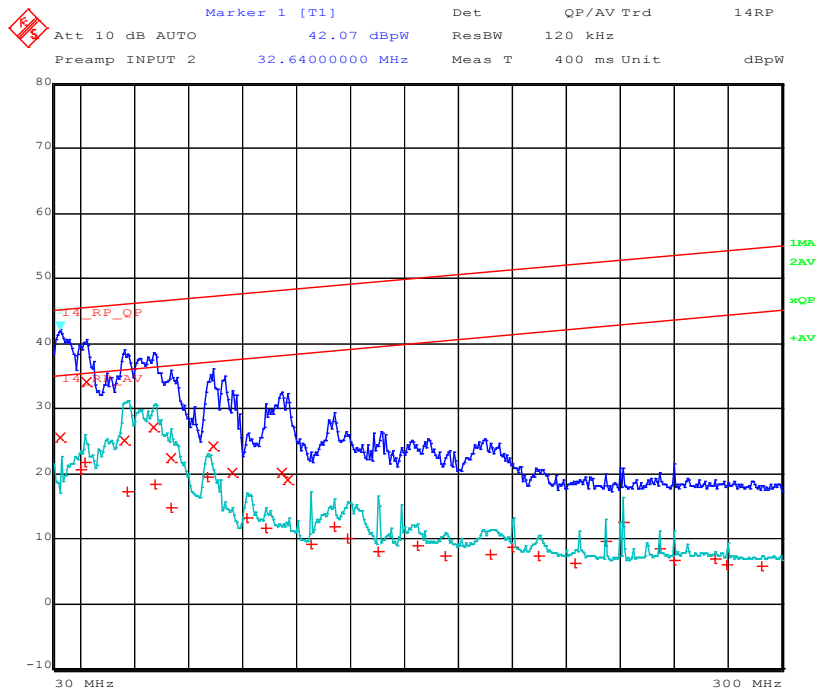
1) Main Line (Cooling mode)



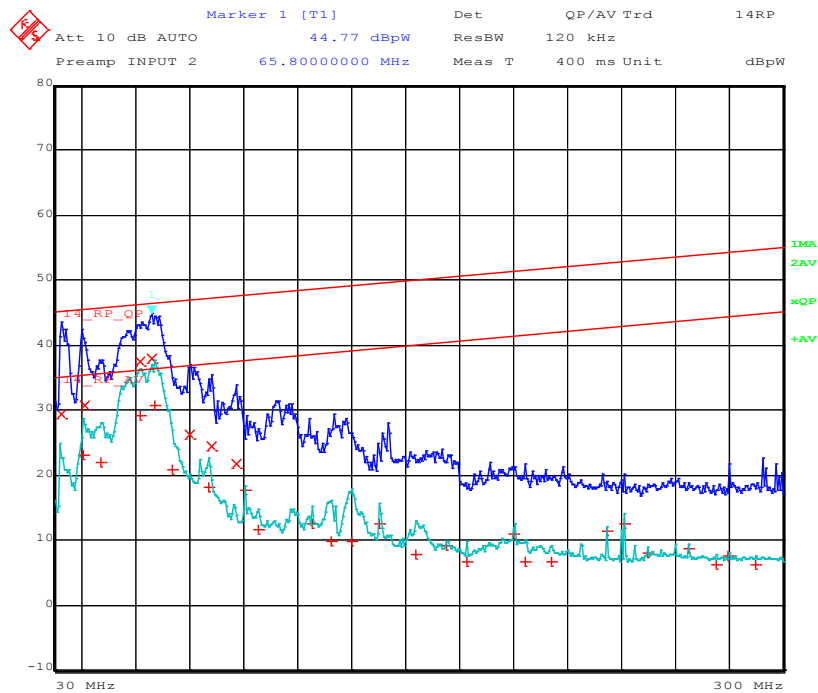
2) Signal Line (Cooling mode)



3) Main Line (Heating mode)



4) Signal Line (Heating mode)



9-2-8. Test Data

Frequency [MHz]	Quasi-Peak			Average			Remark
	Disturbance Level [dBpW]	Permitted Limit [dBpW]	Margin [dB]	Disturbance Level [dBpW]	Permitted Limit [dBpW]	Margin [dB]	
Fundamental frequencies:							
30.0	25.0	45.0	-20.0	15.7	35.0	-19.3	Heating, Main line
45.0	31.7	45.6	-13.9	23.4	35.6	-12.2	Heating, Signal line
65.0	37.9	46.3	-8.4	30.4	36.3	-5.9	Cooling, Singal line
90.0	<<	47.2	<<	<<	37.2	<<	All mode
150.0	<<	49.4	<<	<<	39.4	<<	All mode
180.0	<<	50.6	<<	<<	40.6	<<	All mode
220.0	<<	52.0	<<	<<	42.0	<<	All mode
300.0	<<	55.0	<<	<<	45.0	<<	All mode
Other frequencies:							
32.12	31.9	45.1	-13.2	19.8	35.1	-15.3	Cooling, Signal line
54.88	35.9	45.9	-10.0	27.1	35.9	-8.8	Cooling, Signal line
62.92	41.4	46.2	-4.8	31.7	36.2	-4.5	Heating, Signal line

'<<' means that the disturbance power level is lower than 20 dB below the limit.
The measured value included and revised all related factor (Clamp, Cable loss).

9-3. Discontinuous Interference

The *Discontinuous Interference* measurements were performed by at the following test location:

- Test not applicable

- Test Area No. 3- Shielded room No. 2

9-3-1. Environmental Conditions in the Laboratory

	Actual	
Temperature	24 ~ 26	°C
Relative Humidity	40 ~ 42	%
Atmospheric Pressure	1014 ~ 1015	mBar

9-3-2. Test Equipments

Model Number	Manufacturer	Description	Serial Number
<input type="checkbox"/> - DIA1512C	Chase Electronics	Analyzer	5007
<input type="checkbox"/> - DIA1550C	Chase Electronics	Receiver Module	5007
<input type="checkbox"/> - DIA1558C	Chase Electronics	Receiver Module	5008
<input type="checkbox"/> - DIA1554C	Chase Electronics	Receiver Module	5009
<input type="checkbox"/> - DIA1561C	Chase Electronics	Receiver Module	5006
<input type="checkbox"/> - DIA1562C	Chase Electronics	Receiver Module	5011
<input type="checkbox"/> - DIA1557C	Chase Electronics	Receiver Module	5010
<input checked="" type="checkbox"/> - CL55C	AFJ	Receiver Module	55041242200
<input checked="" type="checkbox"/> - ESH2-Z5	R&S	LISN	100081
<input type="checkbox"/> - NNLK8129	Schwarzbeck	LISN	8129-206

* Software version(DIA1512C) : CL55C Firmware 3.06 Software 7.00

9-3-3. Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above-mentioned way.

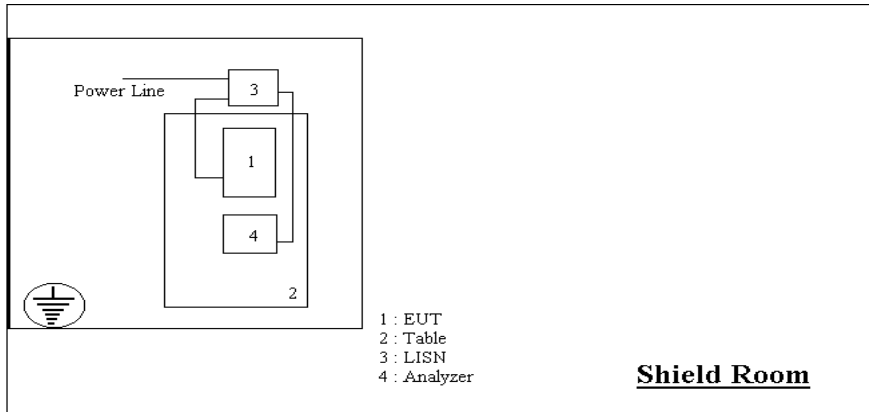
Measurement uncertainty is calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty is given with a confidence of 95 %

Contribution	Estimated Uncertainty dB	Probability Distribution	Coverage Factor k	Standard Uncertainty $u_i(y)$
Receiver Specification	0.70	Normal	2.0	0.35
Attenuation AMN-receiver	1.00	Normal	2.0	0.50
AMN Voltage division factor(Insertion loss)	0.09	Normal	2.0	0.05
AMN Impedance	0.60	Triangular	$\sqrt{6}$	0.24
Mismatch	0.75	U-Shaped	$\sqrt{2}$	0.53
Receiver VRC: $\Gamma_1 = 0.09$ AMN+Cable VRC: $\Gamma_g = 1.0$ Uncertainty limits $20\log(1 \pm \Gamma_1 \Gamma_g)$	-0.82			-0.58
Measurement System Repeatability	0.50	Normal	1.0	0.50
Combined Standard Uncertainty		Normal		1.0 -1.0
Expanded Uncertainty		Normal k=2.0		2.0 -2.0

9-3-4. Test Date: November 12, 2013

9-3-5. Test Setup



Test setup: Discontinuous Interference

9-3-6. Test Data

Operating mode: Cooling and Heating mode

Observation time (min): 120 Minutes

Frequency	(MHz)	0.15	0.50	1.40	30.00
Permitted limit for continuous interference	(dB μ V)	66	56	56	60
Counted clicks < 10 ms	(number)	0	0	0	0
10 ms < clicks < 20 ms	(number)	0	0	0	0
Counted clicks > 20 ms	(number)	0	0	0	0
Counted clicks sum	(number)	0	0	0	0
Duration of continuous interference	(s)	0	0	0	0
Switching operations	(number)	-			
Factor	(f)	-	-	-	-
Click rate, N		< 5	< 5		
Value to be added	(dB)	-	-	-	-
Permitted limit for clicks	(dB μ V)	-	-	-	-
Counted clicks exceeding the limit	(number)	-	-	-	-
Counted clicks allowed to exceed the permitted limit	(number)	-	-	-	-
Complies with the limit		YES	YES	YES	YES

* Note: Any Click was not detected

So, the EUT complied with limit of the discontinuous disturbance voltage measurement.

9-4. Conducted Emissions (Harmonics)

The *Harmonic Current Emissions* measurements were performed at the following test location:

- Test not applicable

- Test Area No. 3 - Shielded room No. 2

9-4-1. Test Configurations

All harmonics were measured up to order 40 as presented by the manufacturer.

The emission test was performed in the mode expected to produce the maximum total harmonic current (THC). All harmonics were measured up to order 40 as presented by the manufacturer. All 1.5 s smoothed r.m.s harmonic current values shall be less than or equal to 150 % of the applicable limits.

The average value was less than equal to the applicable limits.

9-4-2. Environmental Conditions in the Laboratory

	Actual	
Temperature	24~ 26	°C
Relative Humidity	40 ~ 42	%
Atmospheric Pressure	1015 ~ 1016	mBar

9-4-3. Working Mode

The fluctuating harmonics on the AC mains in the frequency range from 0 to 2 kHz were measured in accordance with EN 61000-3-2:2006 + A1:2009 + A2:2009.

9-4-4. Test Equipments

Model Number	Manufacturer	Description	Serial Number
■ - NT20000/M	SPS	AC Power Supply	1201
■ - NT20000/S	SPS	AC Power Supply	1201
■ - PAS20000	SPS	Power Unit	1201
■ - SyCore 1k4	SPS	Control Unit	N/A
■ - ARS 16/3	SPS	Analysis System	1201
□ - ARS 63/3	SPS	Additional Impedance	1201
■ - VTT2BG	SPS	Controller	G11
■ - TDS224	SPS	Oscilloscope	C010315

* Software version: SPS-PHE - EMC test program 2.4

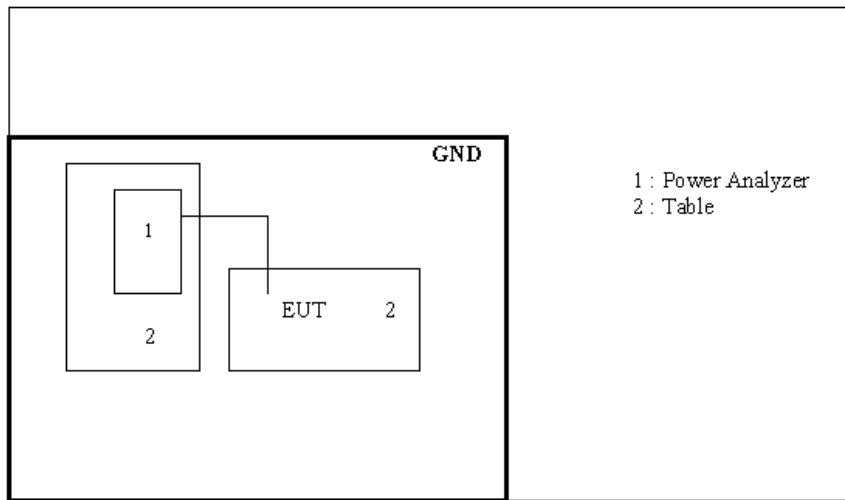
9-4-5. Measurement Uncertainty

The uncertainty of the applied Harmonic currents is within the tolerance specified by the standard.

Contribution	Estimated Uncertainty %	Probability Distribution	Coverage Factor k	Standard Uncertainty $u_i(y)$ [%]
Analyser	0.05	Normal	2.0	0.03
Power source	5.00	Rectangular	$\sqrt{3}$	2.89
Voltage distortion	1.00	Rectangular	$\sqrt{3}$	0.58
Voltage sense	0.10	Rectangular	$\sqrt{3}$	0.06
Heating effect	1.00	Rectangular	$\sqrt{3}$	0.58
Combined Standard Uncertainty		Normal		3.0 -3.0
Expanded Uncertainty		Normal k=2.0		6.0 -6.0

9-4-6. Test Date: November 12, 2013

9-4-7. Test Setup



Test setup: Harmonics meter

9-4-8. Test Data

1) Cooling mode

Maximum RMS current and corresponding values in timewindow 717:

Voltage: 230.59 Vrms THD=0.02 % THV=0.040 V POHV=0.006 V PWHD=0.02 %
 Current: 4.601 Arms THD=25.16 % THC=1.123 A POHC=0.079 A PWHD=13.14 %
 Power: 1027.7 W P1=1027.8 W 1061.0 VA
 Power factor: 0.969 CosPhi1: 1.000

Test conditions: EN 61000-3-2:2006, f=50 Hz, Phase=L1, Range=20.00 A

Time window=10/12 (200ms), Grouping=on

No Ztest selected

harmonic cur. < 0.6 % of I or < 5 mA are NOT DISREGARD for calc. of THD, THC, POHC, PWHD

HARMONIC ANALYSIS: Test PASS

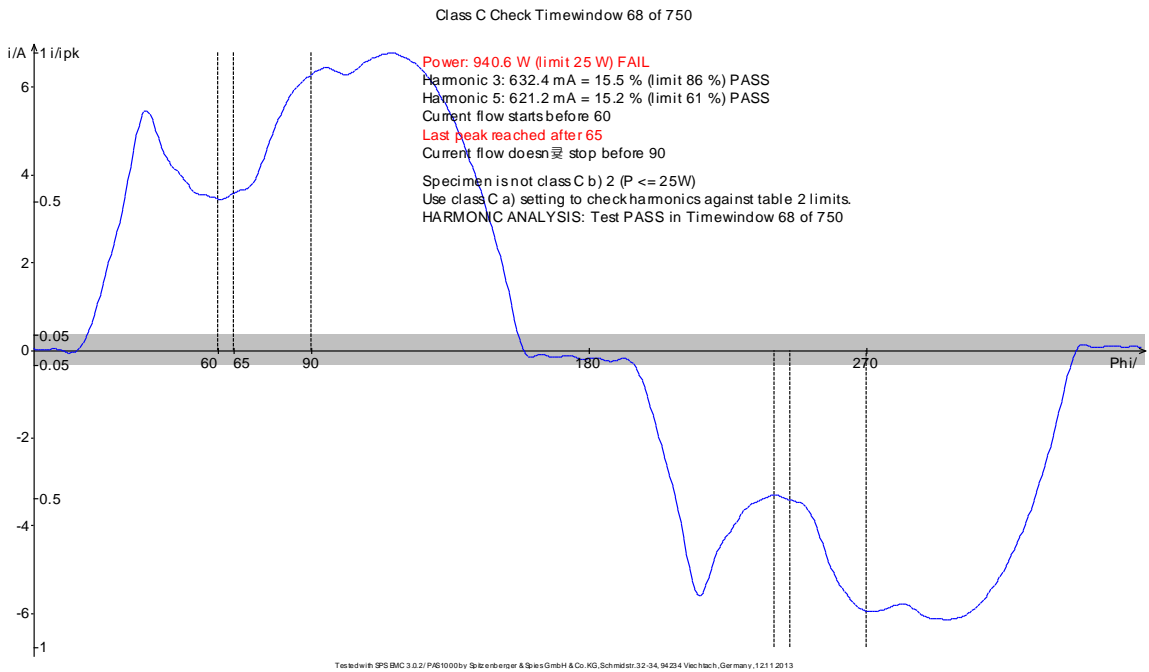
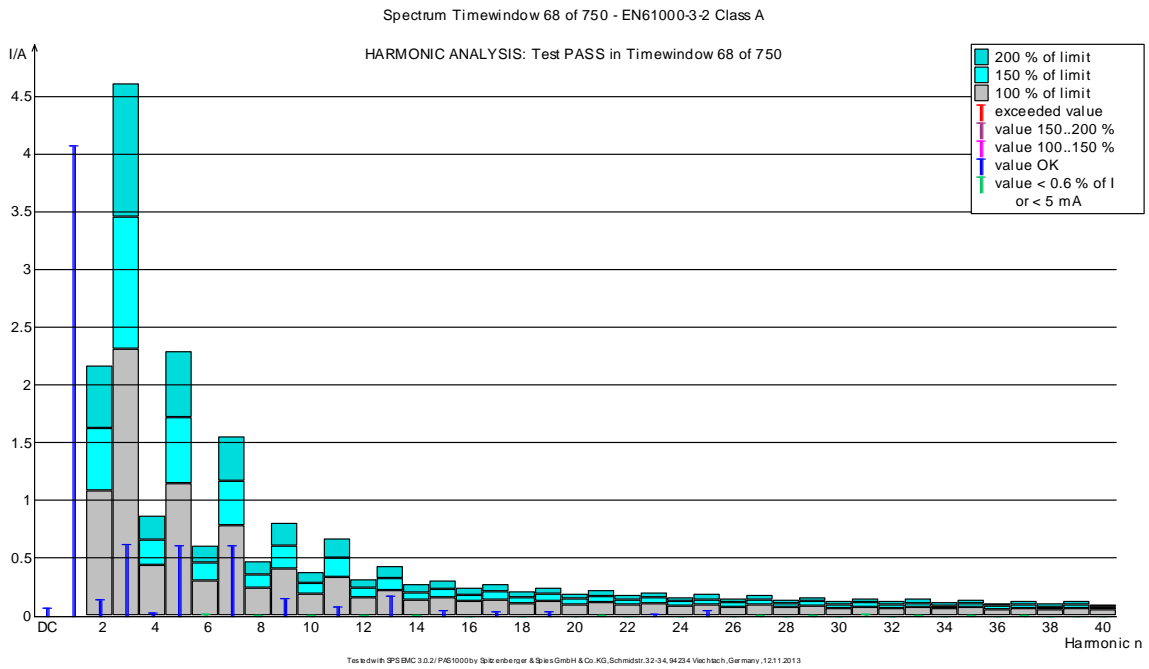
Tobs= entire measurement; POHC: avg=0.08 A, limits=0.25 A

Iavg=4.446 Arms

Ha	Entire measurement (2.5 min = 750 time windows)							Worst 2.5 min		Average		P A S S	F A I L
	Maximum	Window	EN61000-3-2 Class A	Margin n MaxWn	100 to 150%	150 to 200%	Ex- ceeded	100 to 150%	Ex- ceeded	Value	Ex- ceeded		
DC	0.1136 A	488	----	---	0	0	0	n.e.	n.e.	0.0815 A	0	X	
1	4.4581 A	717	----	---	0	0	0	n.e.	n.e.	4.2974 A	0	X	
2	0.1529 A	160	1.0800 A	-85.8 %	0	0	0	n.e.	n.e.	0.1436 A	0	X	
3	0.6435 A	274	2.3000 A	-72.0 %	0	0	0	n.e.	n.e.	0.5877 A	0	X	
4	0.0328 A	160	0.4300 A	-92.4 %	0	0	0	n.e.	n.e.	0.0290 A	0	X	
5	0.6772 A	702	1.1400 A	-40.6 %	0	0	0	n.e.	n.e.	0.6454 A	0	X	
6	0.0263 A	228	0.3000 A	-91.2 %	0	0	0	n.e.	n.e.	0.0233 A	0	X	
7	0.6427 A	498	0.7700 A	-16.5 %	0	0	0	n.e.	n.e.	0.6284 A	0	X	
8	0.0209 A	160	0.2300 A	-90.9 %	0	0	0	n.e.	n.e.	0.0189 A	0	X	
9	0.1736 A	207	0.4000 A	-56.6 %	0	0	0	n.e.	n.e.	0.1626 A	0	X	
10	0.0151 A	257	0.1840 A	-91.8 %	0	0	0	n.e.	n.e.	0.0136 A	0	X	
11	0.1077 A	190	0.3300 A	-67.4 %	0	0	0	n.e.	n.e.	0.0873 A	0	X	
12	0.0123 A	228	0.1533 A	-91.9 %	0	0	0	n.e.	n.e.	0.0109 A	0	X	
13	0.1831 A	68	0.2100 A	-12.8 %	0	0	0	n.e.	n.e.	0.1743 A	0	X	
14	0.0116 A	255	0.1314 A	-91.2 %	0	0	0	n.e.	n.e.	0.0104 A	0	X	
15	0.0654 A	274	0.1500 A	-56.4 %	0	0	0	n.e.	n.e.	0.0564 A	0	X	
16	0.0094 A	160	0.1150 A	-91.8 %	0	0	0	n.e.	n.e.	0.0083 A	0	X	
17	0.0609 A	741	0.1324 A	-54.0 %	0	0	0	n.e.	n.e.	0.0515 A	0	X	
18	0.0081 A	226	0.1022 A	-92.0 %	0	0	0	n.e.	n.e.	0.0071 A	0	X	
19	0.0616 A	716	0.1184 A	-48.0 %	0	0	0	n.e.	n.e.	0.0561 A	0	X	
20	0.0078 A	221	0.0920 A	-91.5 %	0	0	0	n.e.	n.e.	0.0072 A	0	X	
21	0.0178 A	536	0.1071 A	-83.4 %	0	0	0	n.e.	n.e.	0.0123 A	0	X	
22	0.0069 A	214	0.0836 A	-91.7 %	0	0	0	n.e.	n.e.	0.0062 A	0	X	
23	0.0379 A	190	0.0978 A	-61.3 %	0	0	0	n.e.	n.e.	0.0312 A	0	X	
24	0.0061 A	134	0.0767 A	-92.1 %	0	0	0	n.e.	n.e.	0.0054 A	0	X	
25	0.0578 A	401	0.0900 A	-35.8 %	0	0	0	n.e.	n.e.	0.0565 A	0	X	
26	0.0061 A	247	0.0708 A	-91.4 %	0	0	0	n.e.	n.e.	0.0054 A	0	X	
27	0.0243 A	274	0.0833 A	-70.8 %	0	0	0	n.e.	n.e.	0.0205 A	0	X	
28	0.0055 A	162	0.0657 A	-91.7 %	0	0	0	n.e.	n.e.	0.0049 A	0	X	
29	0.0200 A	208	0.0776 A	-74.2 %	0	0	0	n.e.	n.e.	0.0126 A	0	X	
30	0.0048 A	209	0.0613 A	-92.1 %	0	0	0	n.e.	n.e.	0.0043 A	0	X	
31	0.0227 A	72	0.0726 A	-68.8 %	0	0	0	n.e.	n.e.	0.0194 A	0	X	
32	0.0046 A	247	0.0575 A	-91.9 %	0	0	0	n.e.	n.e.	0.0042 A	0	X	
33	0.0181 A	85	0.0682 A	-73.5 %	0	0	0	n.e.	n.e.	0.0133 A	0	X	
34	0.0044 A	163	0.0541 A	-91.9 %	0	0	0	n.e.	n.e.	0.0039 A	0	X	
35	0.0170 A	190	0.0643 A	-73.6 %	0	0	0	n.e.	n.e.	0.0138 A	0	X	
36	0.0039 A	205	0.0511 A	-92.3 %	0	0	0	n.e.	n.e.	0.0035 A	0	X	
37	0.0227 A	717	0.0608 A	-62.7 %	0	0	0	n.e.	n.e.	0.0196 A	0	X	
38	0.0040 A	244	0.0484 A	-91.8 %	0	0	0	n.e.	n.e.	0.0036 A	0	X	
39	0.0117 A	498	0.0577 A	-79.8 %	0	0	0	n.e.	n.e.	0.0085 A	0	X	
40	0.0037 A	143	0.0460 A	-92.0 %	0	0	0	n.e.	n.e.	0.0034 A	0	X	

average value < 0.6 % of Iavg or < 5 mA

Tested with SPS EMC 3.0.2/PAS1000 by Spitz enberger & Spies GmbH & Co. KG, Schmidstr.32-34, 94234 Vechtech, Germany, 1211 2013



2) Heating mode

Maximum RMS current and corresponding values in timewindow 732:

Voltage: 230.51 Vrms THD=0.02 % THV=0.036 V POHV=0.006 V PWHD=0.02 %
 Current: 6.503 Arms THD=18.37 % THC=1.175 A POHC=0.081 A PWHD=10.58 %
 Power: 1472.4 W P1=1473.3 W 1498.9 VA
 Power factor: 0.982 CosPhi: 1.000

Test conditions: EN 61000-3-2:2006, f=50 Hz, Phase=L1, Range=20.00 A

Time window=10/12 (200ms), Grouping=on

No Ztest selected

harmonic cur. < 0.6 % of I or < 5 mA are NOT DISREGARD for calc. of THD, THC, POHC, PWHD

HARMONIC ANALYSIS: Test PASS

Tobs= entire measurement; POHC: avg=0.08 A, limits=0.25 A

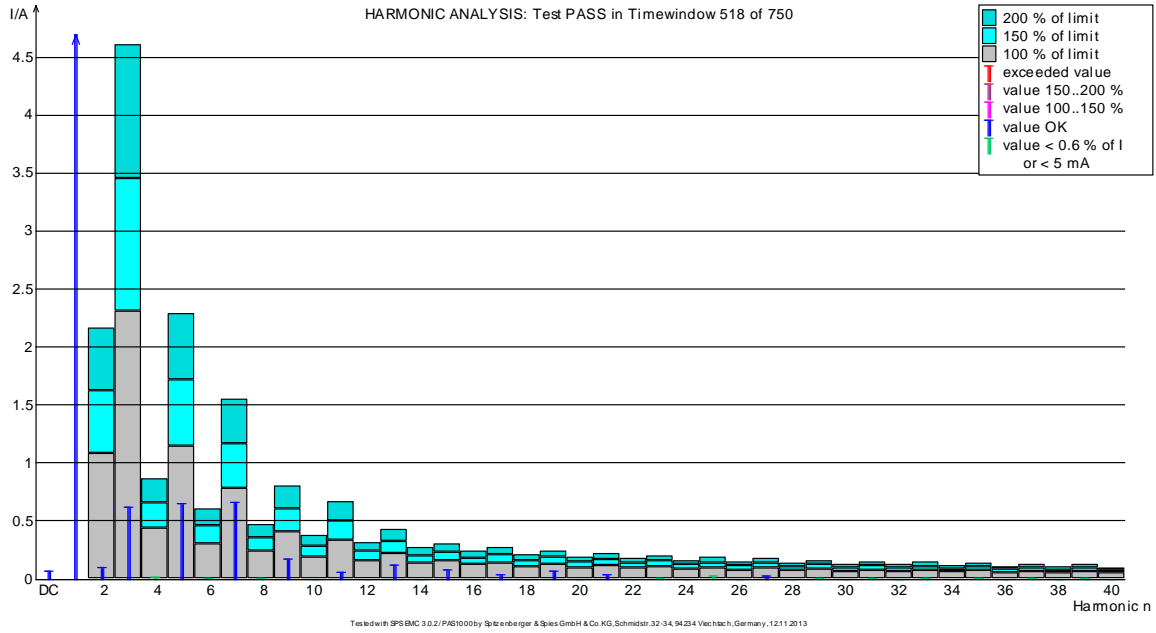
Iavg=5.644 Arms

Ha	Entire measurement (2.5 min = 750 time windows)							Worst 2.5 min		Average		P A S S	F A I L
	Maximum	Window	EN61000-3-2 Class A	Margin in MaxWin	100 to 150%	150 to 200%	Ex- ceeded	100 to 150%	Ex- ceeded	Value	Ex- ceeded		
DC	0.1697 A	12	-----	-----	0	0	0	n.e.	n.e.	0.0856 A	0	X	
1	6.3936 A	732	-----	-----	0	0	0	n.e.	n.e.	5.5166 A	0	X	
2	0.2403 A	22	1.0800 A	-77.7 %	0	0	0	n.e.	n.e.	0.1700 A	0	X	
3	0.6691 A	73	2.3000 A	-70.9 %	0	0	0	n.e.	n.e.	0.5815 A	0	X	
4	0.0659 A	2	0.4300 A	-84.7 %	0	0	0	n.e.	n.e.	0.0380 A	0	X	
5	0.7313 A	609	1.1400 A	-35.8 %	0	0	0	n.e.	n.e.	0.6849 A	0	X	
6	0.0514 A	1	0.3000 A	-82.9 %	0	0	0	n.e.	n.e.	0.0279 A	0	X	
7	0.6718 A	518	0.7700 A	-12.8 %	0	0	0	n.e.	n.e.	0.6552 A	0	X	
8	0.0391 A	2	0.2300 A	-83.0 %	0	0	0	n.e.	n.e.	0.0243 A	0	X	
9	0.1833 A	732	0.4000 A	-54.2 %	0	0	0	n.e.	n.e.	0.1632 A	0	X	
10	0.0276 A	4	0.1840 A	-85.0 %	0	0	0	n.e.	n.e.	0.0171 A	0	X	
11	0.1055 A	12	0.3300 A	-68.0 %	0	0	0	n.e.	n.e.	0.0727 A	0	X	
12	0.0220 A	1	0.1533 A	-85.6 %	0	0	0	n.e.	n.e.	0.0127 A	0	X	
13	0.1797 A	1	0.2100 A	-14.4 %	0	0	0	n.e.	n.e.	0.1431 A	0	X	
14	0.0197 A	2	0.1314 A	-85.0 %	0	0	0	n.e.	n.e.	0.0125 A	0	X	
15	0.0910 A	714	0.1500 A	-39.4 %	0	0	0	n.e.	n.e.	0.0672 A	0	X	
16	0.0165 A	2	0.1150 A	-85.7 %	0	0	0	n.e.	n.e.	0.0108 A	0	X	
17	0.0717 A	381	0.1324 A	-45.9 %	0	0	0	n.e.	n.e.	0.0549 A	0	X	
18	0.0151 A	1	0.1022 A	-85.2 %	0	0	0	n.e.	n.e.	0.0091 A	0	X	
19	0.0836 A	551	0.1184 A	-29.4 %	0	0	0	n.e.	n.e.	0.0757 A	0	X	
20	0.0145 A	1	0.0920 A	-84.3 %	0	0	0	n.e.	n.e.	0.0089 A	0	X	
21	0.0421 A	510	0.1071 A	-60.7 %	0	0	0	n.e.	n.e.	0.0326 A	0	X	
22	0.0120 A	4	0.0836 A	-85.6 %	0	0	0	n.e.	n.e.	0.0076 A	0	X	
23	0.0362 A	12	0.0978 A	-63.0 %	0	0	0	n.e.	n.e.	0.0178 A	0	X	
24	0.0105 A	1	0.0767 A	-86.3 %	0	0	0	n.e.	n.e.	0.0065 A	0	X	
25	0.0534 A	52	0.0900 A	-40.7 %	0	0	0	n.e.	n.e.	0.0445 A	0	X	
26	0.0094 A	1	0.0708 A	-86.7 %	0	0	0	n.e.	n.e.	0.0062 A	0	X	
27	0.0413 A	737	0.0833 A	-50.4 %	0	0	0	n.e.	n.e.	0.0269 A	0	X	
28	0.0086 A	2	0.0657 A	-86.9 %	0	0	0	n.e.	n.e.	0.0062 A	0	X	
29	0.0178 A	11	0.0776 A	-77.1 %	0	0	0	n.e.	n.e.	0.0112 A	0	X	
30	0.0078 A	1	0.0613 A	-87.2 %	0	0	0	n.e.	n.e.	0.0055 A	0	X	
31	0.0258 A	495	0.0726 A	-64.5 %	0	0	0	n.e.	n.e.	0.0220 A	0	X	
32	0.0079 A	1	0.0575 A	-86.3 %	0	0	0	n.e.	n.e.	0.0052 A	0	X	
33	0.0218 A	502	0.0682 A	-68.0 %	0	0	0	n.e.	n.e.	0.0182 A	0	X	
34	0.0072 A	1	0.0541 A	-86.6 %	0	0	0	n.e.	n.e.	0.0049 A	0	X	
35	0.0172 A	483	0.0643 A	-73.2 %	0	0	0	n.e.	n.e.	0.0136 A	0	X	
36	0.0063 A	1	0.0511 A	-87.6 %	0	0	0	n.e.	n.e.	0.0044 A	0	X	
37	0.0216 A	106	0.0608 A	-64.5 %	0	0	0	n.e.	n.e.	0.0184 A	0	X	
38	0.0059 A	1	0.0484 A	-87.9 %	0	0	0	n.e.	n.e.	0.0042 A	0	X	
39	0.0213 A	741	0.0577 A	-63.1 %	0	0	0	n.e.	n.e.	0.0136 A	0	X	
40	0.0052 A	39	0.0460 A	-88.6 %	0	0	0	n.e.	n.e.	0.0042 A	0	X	

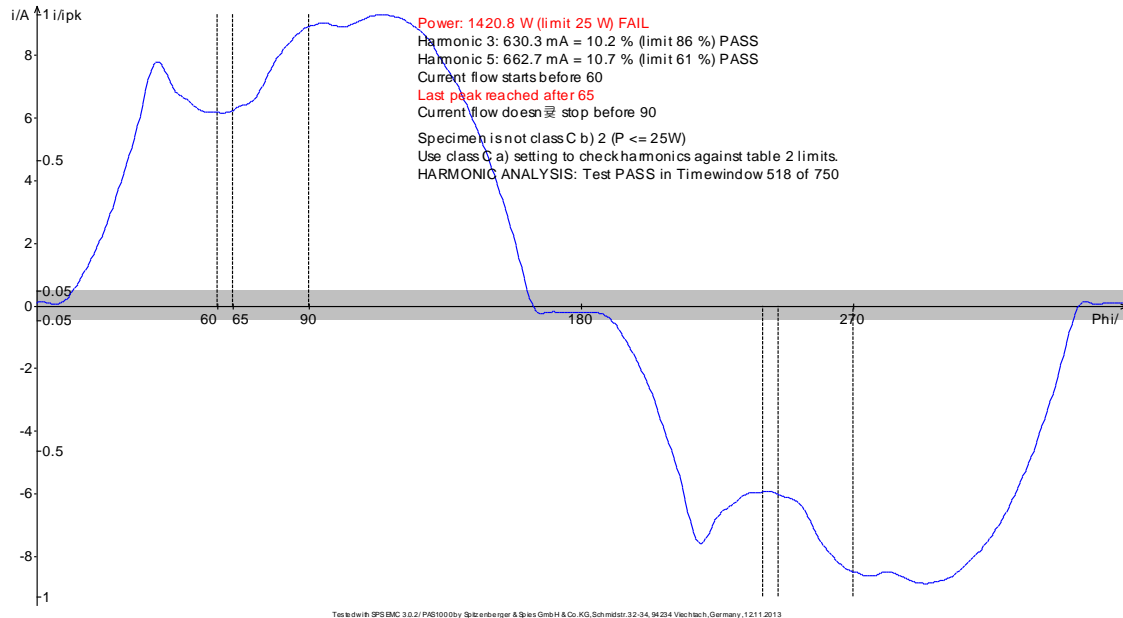
average value < 0.6 % of Iavg or < 5 mA

Tested with SPSEMC 3.0.2/PA61000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr.32-34, 94234 Viechtach, Germany, 1.21.2013

Spectrum Timewindow 518 of 750 - EN61000-3-2 Class A



Class C Check Timewindow 518 of 750



9-5. Voltage Changes, Fluctuations and Flicker (Flickers)

The *Voltage Changes, Fluctuations and Flicker* measurements were performed at the following test location

- Test not applicable

- Test Area No. 3 – Shielded room No. 2

9-5-1. Test Configurations

The equipment was tested in the condition in which is supplied by the manufacturer.
The voltage fluctuations on the AC mains were measured in accordance with EN 61000-3-3:2008.

9-5-2. Environmental Conditions in the Laboratory

		Actual	
Temperature	:	24 ~ 26	°C
Relative Humidity	:	40 ~ 42	%
Atmospheric Pressure	:	1015 ~ 1016	mBar

9-5-3. Working Mode

The measurement was performed only in cooling mode.

9-5-4. Test Equipments

Model Number	Manufacturer	Description	Serial Number
<input checked="" type="checkbox"/> - NT20000/M	SPS	AC Power Supply	1201
<input checked="" type="checkbox"/> - NT20000/S	SPS	AC Power Supply	1201
<input checked="" type="checkbox"/> - PAS20000	SPS	Power Unit	1201
<input checked="" type="checkbox"/> - SyCore 1k4	SPS	Control Unit	N/A
<input checked="" type="checkbox"/> - ARS 16/3	SPS	Analysis System	1201
<input type="checkbox"/> - ARS 63/3	SPS	Additional Impedance	1201
<input checked="" type="checkbox"/> - VTT2BG	SPS	Controller	G11
<input checked="" type="checkbox"/> - TDS224	SPS	Oscilloscope	C010315
* Software version:	SPSPHE – EMC test program 2.4		

9-5-5. Measurement Uncertainty

The uncertainty of the applied Voltage fluctuations and flicker is within the tolerance specified by the standard.

Contribution	Estimated Uncertainty %	Probability Distribution	Coverage Factor k	Standard Uncertainty $u_i(y)$ [%]
Analyser	0.05	Normal	2.0	0.03
Power source	5.00	Rectangular	$\sqrt{3}$	2.89
Voltage distortion	1.00	Rectangular	$\sqrt{3}$	0.58
Voltage sense	0.10	Rectangular	$\sqrt{3}$	0.06
Reference impedance	1.00	Normal	2.0	0.50
Heating effect	1.00	Rectangular	$\sqrt{3}$	0.58
Combined Standard Uncertainty		Normal		3.0 -3.0
Expanded Uncertainty		Normal k=2.0		6.1 -6.1

9-5-6. Test Date: November 12, 2013

9-5-7. Test Setup: Refer to the “Harmonics test setup” in page no. 27.

9-5-8. Test Data

1) According to EN 61000-3-3:2008

- Test Condition mode: Cooling mode

Test conditions EN 61000-3-3:1995 + A1:2001 + A2:2005 / 230 V / 50 Hz / Phase L1 /
Obs 6 x 10 min / Ztest (0.400+j0.250) Ohm

FLICKER: Test PASS!

Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax [%]	dc [%]	PASS	FAIL
15:31:05	1.584	0.1780	- . - - - -	0.000	0.850	0.737	X	
15:41:04	1.619	0.1790	- . - - - -	0.000	0.859	0.623	X	
15:51:04	1.735	0.1800	- . - - - -	0.000	0.862	0.716	X	
16:01:04	1.690	0.1800	- . - - - -	0.000	0.873	0.667	X	
16:11:04	1.799	0.1810	- . - - - -	0.000	0.862	0.724	X	
16:21:04	1.772	0.1810	0.1798	0.000	0.874	0.623	X	
Limits:		1.000	0.650	0.500	6.000	3.300		
Plt: 0.179840							X	
Evaluated: PST, PLT, dc, dmax, d(t)								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax [%]	dc [%]	PASS	FAIL
15:31:05	0.001	0.0200	- . - - - -	0.000	0.024	- . - - - -	X	
15:41:04	0.001	0.0200	- . - - - -	0.000	0.030	- . - - - -	X	
15:51:04	0.001	0.0210	- . - - - -	0.000	0.031	- . - - - -	X	
16:01:04	0.001	0.0210	- . - - - -	0.000	0.031	- . - - - -	X	
16:11:04	0.001	0.0220	- . - - - -	0.000	0.031	- . - - - -	X	
16:21:04	0.001	0.0220	- . - - - -	0.000	0.031	- . - - - -	X	
Plt: 0.021032								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with SPSEMC 3.0.2/PAS1000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 12.11.2013

Note: Pst means "short-term flicker".
Plt means "long-term flicker".
dc means "relative steady-state voltage change".
dmax means "maximum relative voltage change".
d(t) means "relative voltage change".

Constructional Data form for EMC – Testing

Applicant : Air conditioning & Energy Solution Company, LG Electronics Inc.
Address : 76, Seongsan Dong, Seongsan Gu, Changwon City, Gyeong Nam, 641-713, Korea
Factory : 1) Air conditioning & Energy solution Company, LG Electronics Inc.
2) LG Electronics Tianjin Appliance Co., Ltd.
Address : 1) 76, Seongsan Dong, Seongsan Gu, Changwon City, Gyeong Nam, 642-713, Korea
2) No. 9 Jin Wei Road, Bei Chen Dist, Tianjin, China
Type : Room Air Conditioner
Model : USNW126HxA0 (Indoor Unit) Rated voltage : 220~240 Vac / 50 Hz
USUW126HxA0 (Outdoor Unit)
Serial No. : N / A Rated input power : 1,120 W, 4.9 A for Cooling
1,040 W, 4.6 A for Heating
Protection type : Protection class : Class I

Configuration of equipments:

Sources of interference: _____

Internal frequencies: Oscillator Frequency 16 MHz for Indoor Unit
Oscillator Frequency 10 MHz for Outdoor Unit

Noise suppression components: Please refer to a part list regarding to EMC attached.

Measures for electromagnetic shielding: Please refer to a part list regarding to EMC attached.

Home Appliance Company, EMC Center Date: November 29, 2013
Place of issue

■ If applicable, if necessary complete overleaf.

EMC IMMUNITY - TEST REPORT

Test report file No. : **13-EAEU-0281 B/S** Date of Issue : November 29, 2013
Date of receipt of EUT : November 11, 2013

Indoor unit : USNW126HxA0, Z12SL.NSH, E12EL.NSH,
USNW096HxA0, Z09SL.NSH, E09EL.NSH
Model / Serial No. : Outdoor unit : USUW126HxA0, E12EL.UA3,
USUW096HxA0, E09EL.UA3
(See "Page 4" - 4. EUT)

Product Type : Room Air Conditioner

Applicant : Air conditioning & Energy solution Company, LG Electronics Inc.

Manufacturer : 1. Air conditioning & Energy solution Company, LG Electronics Inc.
2. LG Electronics Tianjin Appliance Co., Ltd.

Address : 1. 76, Seongsan Dong, Seongsan Gu, Changwon City, Gyeong Nam,
642-713, Korea
2. Xing Dian Road, Bei Chen Distr., Tianjin 300402, People's Republic of China

Test Result : **Positive (Pass)** **Negative (Fail)**

This test report with appendix consists of **26** pages.
The test result only responds to the tested sample (SN: N/A)
It is not allowed to copy this report even partly without the written permission of the Test Laboratory.

Tested by:



Kim Tae Yul / Research Engineer
Home Appliance Company, EMC Center
LG Electronics Inc.

Reviewed by:



Dae-Woong Kim / Chief Research Engineer
Home Appliance Company, EMC Center
LG Electronics Inc.

File No. **13-EAEU-0281 B/S**, Page 1 of 26
Rev. No. 199912-1

LG Electronics Inc., Home Appliance Company, EMC Center.

(Gaeumjeong-dong), 170, Sungsanpaechongro, Seongsan-gu, Changwon-si, Gyeongsangnam-do 642-711
Korea

Tel: 82-55-260-3966~7. Fax: 82-55-260-3968.

1. DIRECTORY

1-1. Documentation

	Pages
Test Report	1 – 26
Directory / Summary	2
Test Regulations	3
Informations on EUT	4 – 5
Test Configuration and Setup	6 – 25
Constructional Data Form	26

1-2. Test Data

Electrostatic Discharge	6 – 9
Radiated Disturbance	10 – 12
Fast Transients (Burst)	13 – 15
Surge Transients	16 – 18
Conducted Disturbance	19 – 22
Voltage Dips, Interruptions & Variations	23 – 25

2. SUMMARY

All tests according to the regulations cited on page 3 were

- Performed

- Not Performed

The Equipment Under Test

- Fulfills the standard selected on page 3.

- Does not fulfill the standard selected on page 3.

Testing Start Date : November 19, 2013 Testing End Date : November 20, 2013

3. IMMUNITY TEST REGULATIONS

The immunity tests were performed according to the following regulations:

■ - EN 55014-2 / 1997 +A1 / 2001 + A2 / 2008 : Category IV

- - EN 61000-4-2 / 2009
- - EN 61000-4-3 / 2006 + A1 / 2008 + A2 / 2010
- - EN 61000-4-4 / 2004 + A1 / 2010
- - EN 61000-4-5 / 2006
- - EN 61000-4-6 / 2009
- - EN 61000-4-11 / 2004

Note: The EUT contains the electronic control circuitry with
16 MHz (Indoor unit) / 10 MHz (Outdoor unit) internal clock
So, the radiated disturbance immunity test was required.
For updated references, the latest edition of the publication at the time of testing
(including amendments) was applied.

4. Equipment Under Test (EUT)

Model No. Information

Indoor unit : USNW126HxA0, Z12SL NSH, E12EL NSH,
USNW096HxA0, Z09SL.NSH, E09EL.NSH
Outdoor unit : USUW126HxA0, E12EL.UA3,
USUW096HxA0, E09EL.UA3

1. The “x” in model name denotes the cosmetic design and designated as A~Z or 0~9.

Model Z12/09SL & E12/09EL is buyer model name of USNW126/096.

Model E12/09EL is buyer model name of USUW126/096.

Model US-W126H4A0 (Combination of indoor and outdoor) is worst condition for EMC characteristics.
So we tested the “US-W126H4A0” as a representative model.

The equipment under test was operated under the following conditions during emissions testing:

Operating Mode	Power Consumption	Remarks
Cooling mode	1,120 W, 4.9 A	
Heating mode	1,040 W, 4.6 A	

Information about the EUT

Component	Model Name	Remarks
Compressor	GA102MDB	LG Electronics
Motor (Outdoor Unit)	EAU57945702	Shibaura or SCD or Panasonic or Ohsung or SPG or Matsushita
Motor (Indoor Unit)	4681A20091K or 4681A20091U or 4681A20091P	Shibaura or SCD or Panasonic or LG or Ohsung or WELLING
Refrigerant	R410A	0.9 kg

EUT Type

Room Air Conditioner

5. Configuration of the equipment under test

The following peripheral devices and interface cables were connected during the testing:

- _____ Type: _____
 - _____ Type: _____

- Unshielded power cable : 1 Phase, Three line (L1-N-G)

- Unshielded cables

- Shielded cable

- Customer specific cables

- _____

- Test condition: Standby, Cooling and Heating mode

6. Environmental Conditions In The Laboratory

	Actual
Temperature	: 24 ~ 26 °C
Relative Humidity	: 40 ~ 50 %
Atmospheric Pressure	: 1014 ~ 1016 mBar

7. Power Supply Utilized

Power supply system : 220 ~ 240 Vac / 50 Hz / 1 Phase

8. Test Results

8-1. Electrostatic Discharge (ESD)

The immunity against *Electrostatic Discharge (ESD)* events was performed in the following location.

- Test not applicable

- Test Area No. 3 - Shielded room No. 2

8-1-1. Test Configurations

The immunity against electrostatic discharge was tested in accordance with EN 55014-2:1997 +A1:2001+A2:2008.

Test setup and ESD generator were according to EN 61000-4-2:2009. Sensitive points were retested with single air and contact discharges separated by at least 1sec. Tests were applied on all use accessible parts of the equipment.

8-1-2. Environmental Conditions in the Laboratory

	Actual	
Temperature	: 24 ~ 26	°C
Relative Humidity	: 40 ~ 42	%
Atmospheric Pressure	: 1014 ~ 1016	mBar

8-1-3. Test Equipments

- 1st factory

Model Number	Manufacturer	Description	Serial Number
■ - ESS-2000	NoiseKen	ESD Simulator System	2189C01761
■ - TC-815P	NoiseKen	ESD Gun	2189C01749
■ - 07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
■ - FLUKE 43	FLUKE	Power Analyzer	DM7510102

- 2nd factory

Model Number	Manufacturer	Description	Serial Number
<input type="checkbox"/> - ESS-2000	NoiseKen	ESD Simulator System	ESS0331499
<input type="checkbox"/> - TC-815P	NoiseKen	ESD Gun	ESS0351648
<input type="checkbox"/> - 07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
<input type="checkbox"/> - FLUKE 43	FLUKE	Power Analyzer	DM7510102

8-1-4. Measurement Uncertainty

The requirements for measurement uncertainty in ESD testing are deemed to have been satisfied if the ESD generator meets the requirement of the relevant standard EN 61000-4-2:2009.

The uncertainty of the applied electrostatic discharges complies with the standard with at least a 95 % confidence.

8-1-5. Test Specifications

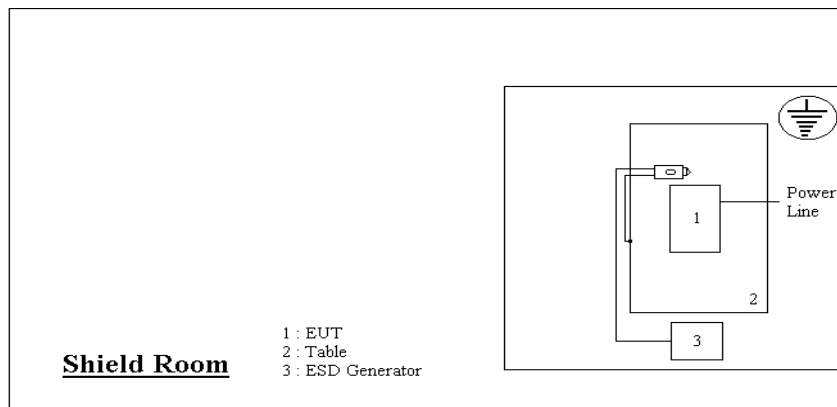
<u>Discharge Voltage (Air)</u>	<input checked="" type="checkbox"/> 2 kV	<input checked="" type="checkbox"/> 6 kV	<input type="checkbox"/> 15 kV
	<input checked="" type="checkbox"/> 4 kV	<input checked="" type="checkbox"/> 8 kV	<input type="checkbox"/> _____ kV
<u>Discharge Voltage (Contact)</u>	<input checked="" type="checkbox"/> 2 kV	<input type="checkbox"/> 6 kV	<input type="checkbox"/> _____ kV
	<input checked="" type="checkbox"/> 4 kV	<input type="checkbox"/> 8 kV	
<u>Discharge Impedance</u>	<input checked="" type="checkbox"/> 330 Ω / 150 pF	<input type="checkbox"/> 150 Ω / 150 pF (if)	
<u>Discharge Repetition Rate</u>	<input checked="" type="checkbox"/> ≥ 1 sec.		
<u>Number of Discharges</u>	<input checked="" type="checkbox"/> ≥ 10 at all locations		
<u>Kind of Discharges</u>	<input checked="" type="checkbox"/> Air discharge	<input checked="" type="checkbox"/> Contact discharge	
	<input checked="" type="checkbox"/> Direct	<input checked="" type="checkbox"/> Indirect	
<u>Polarity</u>	<input checked="" type="checkbox"/> Positive	<input checked="" type="checkbox"/> Negative	
<u>Location of Discharge</u>	<input checked="" type="checkbox"/> See Data Record(s) in test point map.		
	<input checked="" type="checkbox"/> Each location on the surface touchable by hand		
	<input checked="" type="checkbox"/> HCP / VCP		

8-1-6. Result

- | | |
|--|-----------------------|
| <input checked="" type="checkbox"/> No degradation of function | Criterion A |
| <input type="checkbox"/> Distortion of function | Criterion B |
| <input type="checkbox"/> Error of function | Criterion C |
| <input type="checkbox"/> Loss of function | Unrecoverable Failure |

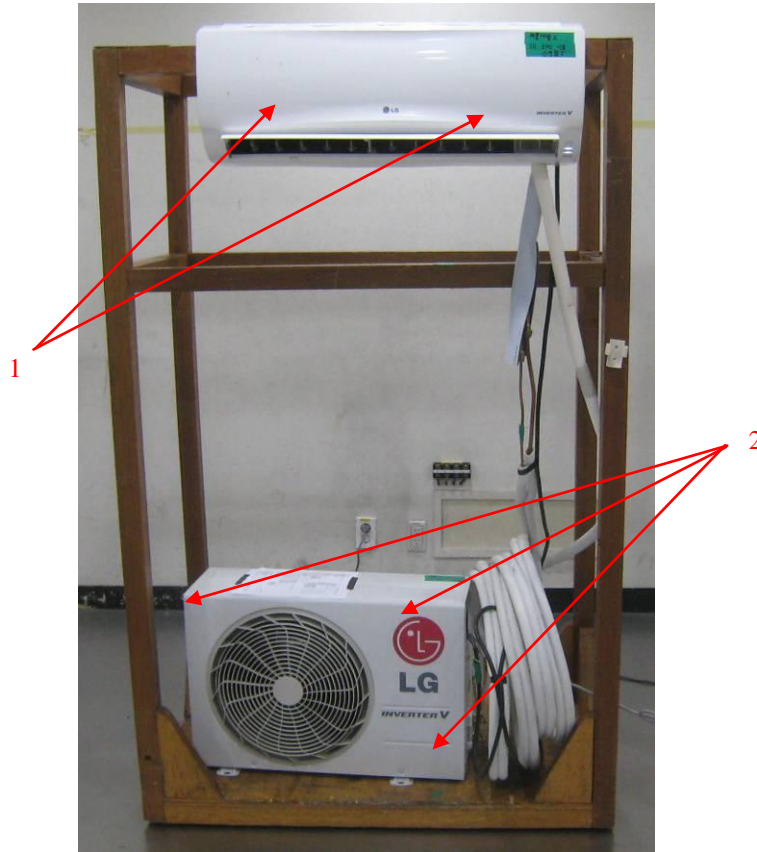
Remarks: Test Date: November 19, 2013

8-1-7. Test Setup



Test setup: Electrostatic discharge (ESD)

* Drawing of the EUT showing the location of the selected test point.



	Point	Level	Discharge Method
1	Indoor Unit Enclosure	± 8 kV	Air
2	Outdoor Unit Enclosure	± 4 kV	Contact
3	Remote Controller	± 8 kV	Air
4	VCP	± 4 kV	Contact

8-2. Radiated Disturbance

The immunity against *Radiated Disturbance* events, induced by radio frequency fields above 9 kHz, was performed in the following test location:

- Test not applicable

- Test Area No. 4 – Compact Chamber

8-2-1. Test Configurations

The immunity to radiated radio frequency disturbances was tested according to EN 55014-2 / 1997 + A1 / 2001 + A2 / 2008. The EUT was placed on a non-conducting table 0.1 m above the reference ground plane covered with grid ferrite tiles. Before testing, the intensity of the established field strength was checked by placing the field sensor at a calibration grid point. The distance between antenna and EUT was 3 m.

8-2-2. Environmental Conditions in the Laboratory

		Actual	
Temperature	:	23 ~ 24	°C
Relative Humidity	:	40 ~ 42	%
Atmospheric Pressure	:	1014 ~ 1016	mBar

8-2-3. Test Equipments

Model Number	Manufacturer	Description	Serial Number
■ - 250W1000M3	A&R	RF Amplifier (80~1000 MHz)	301801
■ - URV5-Z2	Rohde Schwarz	Power Sensor	100005
■ - NRVD	Rohde Schwarz	Power Meter	100273
■ - 8648C	Agilent	Signal Generator	3847M00229
■ - 33120A	Agilent	Function Generator	MY40011936
■ - HI-6005	Holaday	E-Field Probe	107804
■ - C6148	Werlatone	Directional Coupler	9648
■ - RSM-02	TDK	Switch Controller	123900
■ - SI-300CC	TDK	Camera Controller	120092
■ - SI-300	TDK	System Interface	200111
■ - VC-04	TDK	AC, DC Camera	1174001/1173001
■ - SSM-20N5U	SONY	Monitor	6012611/6012502

Software

A&R = Amplifier Research

8-2-4. Measurement Uncertainty

The requirements for measurement uncertainty in Radiated Immunity testing are deemed to have been satisfied if the Radiated Immunity Test generator meets the requirement of the relevant standard EN EN 61000-4-3: 2006 + A1: 2008 + A2: 2010.

The uncertainty of the applied radiated immunity test generator complies with the standard with at least a 95 % confidence.

8-2-5. Test Specifications

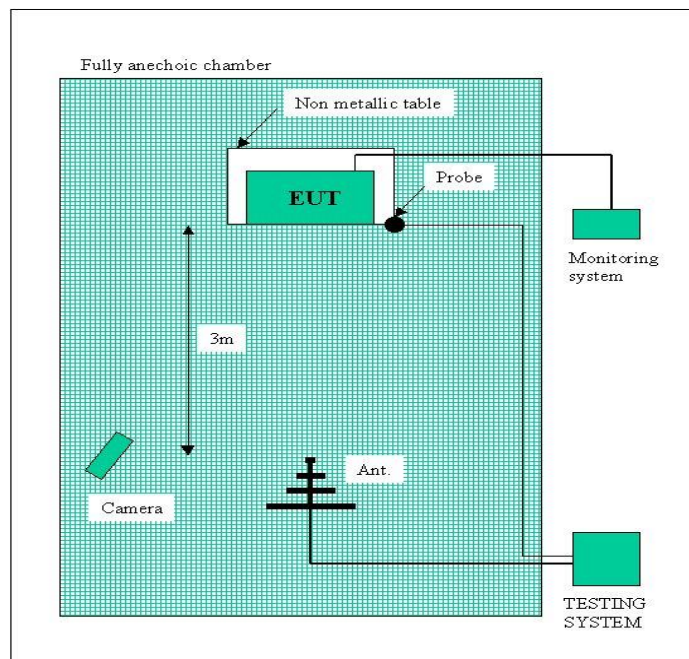
Frequency Range	<input type="checkbox"/> 0.15 MHz - 80 MHz	<input checked="" type="checkbox"/> 80 MHz - 1000 MHz
Voltage Level (EMF)	<input type="checkbox"/> 1 V/m	<input checked="" type="checkbox"/> 3 V/m
Modulation	<input checked="" type="checkbox"/> AM: <u>80</u> % <u>1</u> kHz <input type="checkbox"/> FM: _____ kHz dev. _____ kHz <input checked="" type="checkbox"/> Sine wave: <input type="checkbox"/> Unmodulated <input type="checkbox"/> Pulse ON/OFF Duty Cycle: _____ %	
Step	<input type="checkbox"/> < 0.015 decades / sec	<input checked="" type="checkbox"/> 1%
Dwell Time	<input checked="" type="checkbox"/> <u>3</u> Sec. (min. 3 Sec.)	<input type="checkbox"/> 1 Sec. (min. 1 Sec.)

8-2-6. Results

- | | |
|--|-----------------------|
| <input checked="" type="checkbox"/> No degradation of function | Criterion A |
| <input type="checkbox"/> Distortion of function | Criterion B |
| <input type="checkbox"/> Error of function | Criterion C |
| <input type="checkbox"/> Loss of function | Unrecoverable Failure |

Remarks: Test Date: November 19, 2013

8-2-7. Test Setup



Test setup: Radiated Immunity (RS)

8-3. Fast Transients (BURST)

The immunity against *Fast Transients (Burst)* events was performed in the following test location.

- Test not applicable

- Test Area No. 3 - Shielded room No. 2

8-3-1. Test Configurations

The EUT was placed on an insulating support of 0.1 m thickness above the ground reference plane. The cable length between coupling network and EUT was 0.5 m. This cable was kept at least 0.1 m above the ground reference plane.

8-3-2. Environmental Conditions in the Laboratory

	Actual	
Temperature	24 ~ 26	°C
Relative Humidity	40 ~ 42	%
Atmospheric Pressure	1014 ~ 1016	mBar

8-3-3. Test Equipments

- 1st factory

	Model Number	Manufacturer	Description	Serial Number
<input type="checkbox"/>	NSG2025-8	Schaffner	EFT/Burst Generator	8026
<input checked="" type="checkbox"/>	NSG3060-1	TESEQ	EFT/Burst Generator	1293
<input checked="" type="checkbox"/>	CDN126	Schaffner	Capacitive Coupling Clamp	503
<input type="checkbox"/>	FNS-AX2-B50	NoiseKen	EFT/Burst Generator	FNS03210179
<input type="checkbox"/>	15-00001A	NoiseKen	Capacitive Coupling Clamp	-
<input checked="" type="checkbox"/>	07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
<input checked="" type="checkbox"/>	FLUKE 43	FLUKE	Power Analyzer	DM7510102

* Software version: WIN 2025 Ver. 3.11

- 2nd factory

	Model Number	Manufacturer	Description	Serial Number
<input type="checkbox"/>	FNS-AX2-B50	NoiseKen	EFT/Burst Generator	FNS03210179
<input type="checkbox"/>	15-00001A	NoiseKen	Capacitive Coupling Clamp	-
<input type="checkbox"/>	07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
<input type="checkbox"/>	FLUKE 43	FLUKE	Power Analyzer	DM7510102

* Software version:

8-3-4. Measurement Uncertainty

The requirements for measurement uncertainty in Burst testing are deemed to have been satisfied if the Burst generator meets the requirement of the relevant standard EN 61000-4-4:2004 + A1:2010.

The uncertainty of the applied fast transients/burst complies with the standard with at least a 95 % confidence.

8-3-5. Test Specifications

<u>Pulse Amplitude – AC Power Port</u>	<input checked="" type="checkbox"/> 1.0 kV	<input type="checkbox"/> 2.0 kV	
	<input type="checkbox"/> 4.0 kV	<input type="checkbox"/> _____ kV	
<u>Pulse Amplitude – DC Power Port</u>	<input type="checkbox"/> 1.0 kV	<input type="checkbox"/> 2.0 kV	
	<input type="checkbox"/> 4.0 kV	<input type="checkbox"/> _____ kV	
<u>Pulse Amplitude - Process (Measurement & Control Port)</u>	<input checked="" type="checkbox"/> 0.5 kV	<input type="checkbox"/> 1.0 kV	
	<input type="checkbox"/> 2.0 kV	<input type="checkbox"/> _____ kV	
<u>Burst Frequency</u>	<input type="checkbox"/> 2.5 kHz	<input checked="" type="checkbox"/> 5.0 kHz	<input type="checkbox"/> _____ kHz
<u>Time of Coupling</u>	<input type="checkbox"/> 60 seconds	<input checked="" type="checkbox"/> 120 seconds	<input type="checkbox"/> _____ Seconds
<u>Coupling Method</u>	<input checked="" type="checkbox"/> Coupling/decoupling network	<input checked="" type="checkbox"/> Coupling clamp	
<u>Polarity</u>	<input checked="" type="checkbox"/> Positive	<input checked="" type="checkbox"/> Negative	

Location of Coupling:

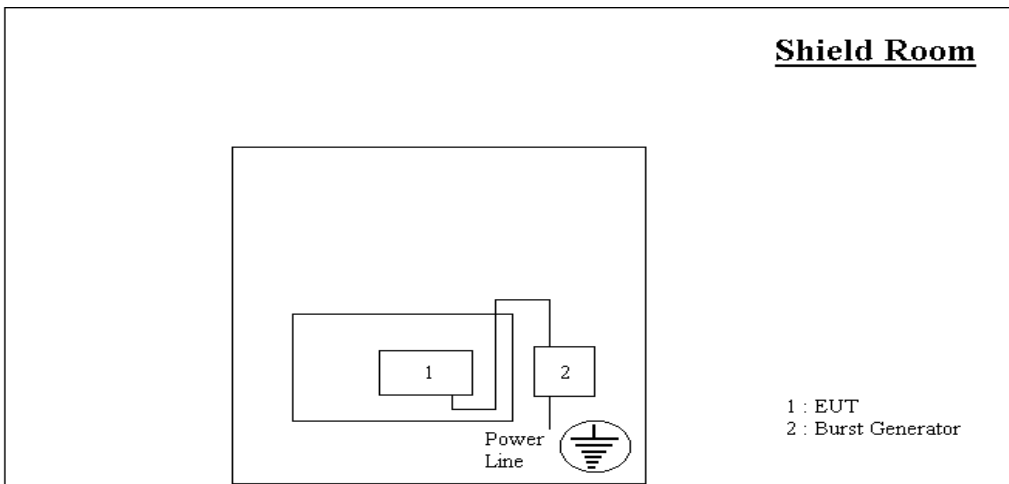
Name of lines	<u>AC Power Line</u>	
Type of lines	<input type="checkbox"/> Shielded	<input checked="" type="checkbox"/> Unshielded
Status of lines	<input type="checkbox"/> Passive	<input checked="" type="checkbox"/> Active
Kind of transmission	<input checked="" type="checkbox"/> Analog	<input type="checkbox"/> Digital
Length of lines	0.5 m	
Result	<input checked="" type="checkbox"/> Positive	<input type="checkbox"/> Negative
Name of lines	<u>Signal Line</u>	
Type of lines	<input type="checkbox"/> Shielded	<input checked="" type="checkbox"/> Unshielded
Status of lines	<input type="checkbox"/> Passive	<input checked="" type="checkbox"/> Active
Kind of transmission	<input checked="" type="checkbox"/> Analog	<input type="checkbox"/> Digital
Length of lines	5.0 m	
Result	<input checked="" type="checkbox"/> Positive	<input type="checkbox"/> Negative

8-3-6. Result

- | | |
|--|-----------------------|
| <input checked="" type="checkbox"/> No degradation of function | Criterion A |
| <input type="checkbox"/> Distortion of function | Criterion B |
| <input type="checkbox"/> Error of function | Criterion C |
| <input type="checkbox"/> Loss of function | Unrecoverable Failure |

Remarks: Test Date: November 20, 2013

8-3-7. Test Setup



Test setup: Fast transients (Burst)

8-4. Surge Transients

The immunity against *Surge Transients* events was performed in the following test location.

- Test not applicable

- Test Area No. 3 - Shielded room No. 2

8-4-1. Environmental Conditions in the Laboratory

	Actual	
Temperature	: 24 ~ 26	°C
Relative Humidity	: 40 ~ 42	%
Atmospheric Pressure	: 1014 ~ 1016	mBar

8-4-2. Test Equipments

- 1st factory

Model Number	Manufacturer	Description	Serial Number
LSS-15SX C3	NoiseKen	Surge Generator	1100E00530
<input checked="" type="checkbox"/> - NSG3060-1	TESEQ	Surge Generator	1293
<input type="checkbox"/> - LSS-15AX-B3R-G584	NoiseKen	Surge Generator	LSS0750741
<input checked="" type="checkbox"/> - 07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
<input checked="" type="checkbox"/> - FLUKE 43	FLUKE	Power Analyzer	DM7510102
* Software version	:		

- 2nd factory

Model Number	Manufacturer	Description	Serial Number
<input type="checkbox"/> - LSS-15AX-B3R-G584	NoiseKen	Surge Generator	LSS0750741
<input type="checkbox"/> - 07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
<input type="checkbox"/> - FLUKE 43	FLUKE	Power Analyzer	DM7510102
* Software version	:		

8-4-3. Measurement Uncertainty

The requirements for measurement uncertainty in Surge testing are deemed to have been satisfied if the Surge generator meets the requirement of the relevant standard EN 61000-4-5:2006.

The uncertainty of the applied surge complies with the standard with at least a 95 % confidence.

8-4-4. Test Specifications

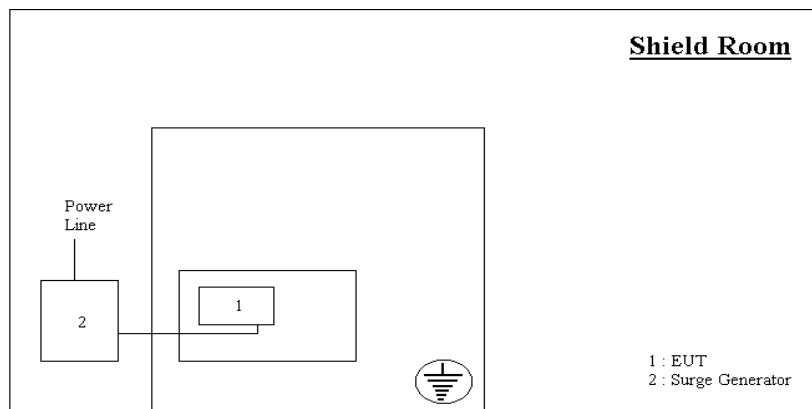
<u>Pulse Amplitude - AC Power Port</u>	<input checked="" type="checkbox"/> 1.0 kV	<input checked="" type="checkbox"/> 2.0 kV
	<input type="checkbox"/> 4.0 kV	<input type="checkbox"/> _____ kV
<u>Pulse Amplitude - DC Power Port</u>	<input type="checkbox"/> 1.0 kV	<input type="checkbox"/> 2.0 kV
	<input type="checkbox"/> 4.0 kV	<input type="checkbox"/> _____ kV
<u>Pulse Amplitude - Signal/Data</u> (Non control Port)	<input type="checkbox"/> 0.5 kV	<input type="checkbox"/> 1.0 kV
	<input type="checkbox"/> 2.0 kV	<input type="checkbox"/> _____ kV
<u>Source Impedance</u>	<input checked="" type="checkbox"/> 2 Ω + 18 uF	<input checked="" type="checkbox"/> 12 Ω + 9 uF
	<input type="checkbox"/> 42 Ω + 0.1 uF	<input type="checkbox"/> 42 Ω + 0.5 uF
<u>Number of Surges</u>	<input checked="" type="checkbox"/> 5 surges / angle	<input type="checkbox"/> _____ surges / angle
<u>Angle</u>	<input type="checkbox"/> 0 °C	<input checked="" type="checkbox"/> 90 °C
	<input type="checkbox"/> 180 °C	<input checked="" type="checkbox"/> 270 °C
<u>Repetition Rate</u> (Continued)	<input checked="" type="checkbox"/> 60 Sec.	<input type="checkbox"/> _____ Sec.
<u>Polarity</u>	<input checked="" type="checkbox"/> Positive	<input checked="" type="checkbox"/> Negative
<u>Location of Coupling:</u>		
<u>Name of lines</u>	<u>AC Power Line</u>	
<u>Type of lines</u>	<input type="checkbox"/> Shielded	<input checked="" type="checkbox"/> Unshielded
<u>Status of lines</u>	<input type="checkbox"/> Passive	<input checked="" type="checkbox"/> Active
<u>Kind of transmission</u>	<input checked="" type="checkbox"/> Analog	<input type="checkbox"/> Digital
<u>Length of lines</u>	2.0 m	
<u>Result</u>	<input checked="" type="checkbox"/> Positive	<input type="checkbox"/> Negative

8-4-5. Result

- | | |
|--|-----------------------|
| <input checked="" type="checkbox"/> No degradation of function | Criterion A |
| <input type="checkbox"/> Distortion of function | Criterion B |
| <input type="checkbox"/> Error of function | Criterion C |
| <input type="checkbox"/> Loss of function | Unrecoverable Failure |

Remarks: Test Date: November 20, 2013

8-4-6. Test Setup



Test setup: Surge transients

8-5. Conducted Disturbance

The immunity against *Conducted Disturbance* events, induced by radio frequency fields above 9 kHz, was performed in the following test location.

- Test not applicable

- Test Area No. 3 – Shielded room No. 2

8-5-1. Test Configurations

The immunity to conducted radio frequency disturbances was tested according to EN 55014-2:1997+A1:2001+A2:2008. The EUT was placed on a wooden table 0.1 m above the ground reference plane. The injection point was in a distance of 0.1~0.3 m to the EUT. The coupling factor of the RF Amplifier, cables and the CDN had been recorded before the test.

8-5-2. Environmental Conditions in the Laboratory

		Actual	
Temperature	:	24 ~ 26	°C
Relative Humidity	:	40 ~ 42	%
Atmospheric Pressure	:	1014 ~ 1016	MBar

8-5-3. Test Equipments

- 1st factory

	Model Number	Manufacturer	Description	Serial Number
<input type="checkbox"/>	NSG2070-1	Schaffner	RF-Generator	172
<input checked="" type="checkbox"/>	NSG 4070A-75	TESEQ	RF-Generator	034297
<input checked="" type="checkbox"/>	CDN725	Schaffner	EM Clamp	205
<input type="checkbox"/>	CDN-M1-50	Schaffner	CDN	9929
<input type="checkbox"/>	CDN-M2-50	Schaffner	CDN	9940
<input type="checkbox"/>	CDN-M3-50	Schaffner	CDN	9941
<input checked="" type="checkbox"/>	CDN M332	TESEQ	CDN	33271
<input type="checkbox"/>	CDN-M5-50	Schaffner	CDN	9942
<input type="checkbox"/>	CDN-150-50	Schaffner	Passive Impedance Adapter	9934, 5
<input checked="" type="checkbox"/>	INA726	Schaffner	Decoupling Clamp	68
<input type="checkbox"/>	MD720	Schaffner	Current Monitor	19
<input type="checkbox"/>	CDN721	Schaffner	Injection Current Probe	95
<input checked="" type="checkbox"/>	68-6-43	BIRD	Attenuator	RB507
<input checked="" type="checkbox"/>	07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117

* Software version: WIN 2027 Ver. 3.2

- 2nd factory

Model Number	Manufacturer	Description	Serial Number
<input type="checkbox"/> - CIT-10/75	Frankonia	RF-Generator	102C3211
<input type="checkbox"/> - F-2031-32MM	FCC	EM Clamp	461
<input type="checkbox"/> - CDN L1	Frankonia	CDN	A3001008
<input type="checkbox"/> - CDN M2	Frankonia	CDN	A3002017
<input type="checkbox"/> - FCC-801-M3-50A	FCC	CDN	03022
<input type="checkbox"/> - FCC-801-M5-50A	FCC	CDN	03003
<input type="checkbox"/> - FCC-801-150-50-CDN	FCC	Passive Impedance Adapter	03041, 42
<input type="checkbox"/> - F-2031-DCN-32MM	FCC	Decoupling Clamp	295
<input type="checkbox"/> - F-52	FCC	Current Monitor	207
<input type="checkbox"/> - F-120-9A	FCC	Injection Current Probe	363
<input type="checkbox"/> - 07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
<input type="checkbox"/> - AT-80	NoiseKen	Attenuator	INS0320499
<input type="checkbox"/> - FLUKE 43	FLUKE	Power Analyzer	DM7510102
* Software version:	WIN 2027 Ver. 3.2		

8-5-4. Measurement Uncertainty

Immunity to conducted disturbance: ± 2.7 dB. Measurement uncertainty is calculated in accordance with ISO "Guide to the Expression of Uncertainty in measurement".

The measurement uncertainty is given with a confidence of 95 %.

8-5-5. Test Specifications

<u>Frequency Range</u>	<input checked="" type="checkbox"/> 0.15 MHz - 80 MHz	<input type="checkbox"/> 0.15 MHz - 230 MHz
<u>Voltage Level (EMF)</u>	<input checked="" type="checkbox"/> 1 V	<input checked="" type="checkbox"/> 3 V
<u>Modulation</u>	<input checked="" type="checkbox"/> AM: <u>80</u> % <u>1</u> kHz <input type="checkbox"/> FM: _____ kHz dev. _____ kHz <input checked="" type="checkbox"/> Sine wave: <input type="checkbox"/> Unmodulated <input type="checkbox"/> Pulse ON/OFF Duty Cycle: _____ %	
<u>Step</u>	<input type="checkbox"/> < 0.015 decades / sec	<input checked="" type="checkbox"/> 1%
<u>Dwell Time</u>	<input checked="" type="checkbox"/> <u>3</u> Sec.(min. 3 Sec.)	

Location of Coupling:

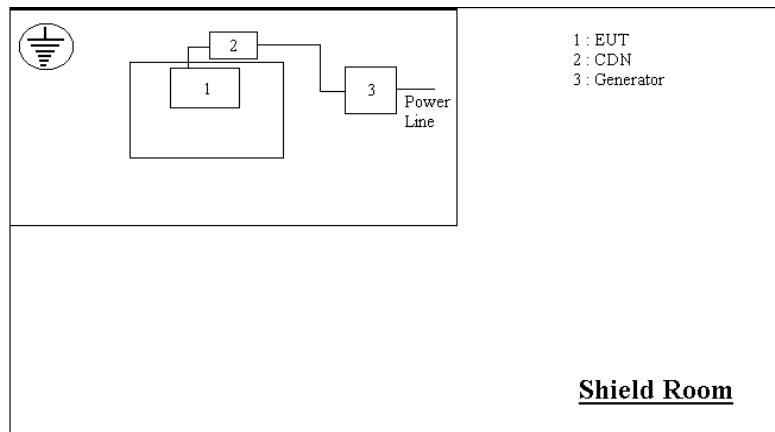
Name of lines	<u>AC Power Line</u>	
Type of lines	<input type="checkbox"/> Shielded	<input checked="" type="checkbox"/> Unshielded
Status of lines	<input type="checkbox"/> Passive	<input checked="" type="checkbox"/> Active
Kind of transmission	<input checked="" type="checkbox"/> Analog	<input type="checkbox"/> Digital
Length of lines	<u>0.3 m</u>	
Result	<input checked="" type="checkbox"/> Positive	<input type="checkbox"/> Negative
Name of lines	<u>Signal Line</u>	
Type of lines	<input type="checkbox"/> Shielded	<input checked="" type="checkbox"/> Unshielded
Status of lines	<input type="checkbox"/> Passive	<input checked="" type="checkbox"/> Active
Kind of transmission	<input checked="" type="checkbox"/> Analog	<input type="checkbox"/> Digital
Length of lines	<u>5.0 m</u>	
Result	<input checked="" type="checkbox"/> Positive	<input type="checkbox"/> Negative

8-5-6. Result

- | | |
|--|-----------------------|
| <input checked="" type="checkbox"/> No degradation of function | Criterion A |
| <input type="checkbox"/> Distortion of function | Criterion B |
| <input type="checkbox"/> Error of function | Criterion C |
| <input type="checkbox"/> Loss of function | Unrecoverable Failure |

Remarks: Test Date: November 20, 2013

8-5-7. Test Setup



Test setup: Conducted disturbance (CS)

8-6. Voltage Dips & Interruptions & Variations

The immunity against *Voltage Dips, Interruptions & Variations* events was performed in the following test location.

- Test not applicable

- Test Area No. 3 - Shielded room No. 2

8-6-1. Test Configurations

Test setup was according to EN61000-4-11:2004.

For the 100 % voltage interruption, positive and negative halfcycles were tested.

8-6-2. Environmental Conditions in the Laboratory

		Actual	
Temperature	:	24 ~ 26	°C
Relative Humidity	:	40 ~ 42	%
Atmospheric Pressure	:	1014 ~ 1015	mBar

8-6-3. Test Equipments

Model Number	Manufacturer	Description	Serial Number
■ - NT20000/M	SPS	AC Power Supply	1201
■ - NT20000/S	SPS	AC Power Supply	1201
■ - PAS20000	SPS	Power Unit	1201
■ - SyCore 1k4	SPS	Control Unit	N/A
■ - ARS 16/3	SPS	Analysis System	1201
□ - ARS 63/3	SPS	Additional Impedance	1201
■ - VTT2BG	SPS	Controller	G11
■ - TDS224	SPS	Oscilloscope	C010315
■ - 07-00016A	NoiseKen	Temp. & Humidity Sensor	6099C02117
■ - FLUKE 43	FLUKE	Power Analyzer	DM7510102

* Software version: SPS-PHE - EMC test program 2.4

* SPS: Spitzenberger + Spies GmbH & Co. KG

8-6-4. Measurement Uncertainty

Standard tolerance of test equipment is 0.01~312 V, +/-5 %.

While, specification of used voltage dip generator was 0.01~312 V, +/-0.1 %.

So the uncertainty of the applied voltage dip is within the tolerance specified by the standard.

8-6-5. Test Specifications

Nominal Mains Voltage (V_{NOM})	<input checked="" type="checkbox"/> 230 Vac	<input type="checkbox"/> 240 Vac	<input type="checkbox"/> _____ Vdc
Level of Reduction (dip)	<input checked="" type="checkbox"/> 500 ms at 30 % of V_{NOM}	<input checked="" type="checkbox"/> 200 ms at 60 % of V_{NOM}	
Duration of Interruption ($>.95*V_{NOM}$):	<input checked="" type="checkbox"/> 10 ms	<input type="checkbox"/> _____ Ms	
Voltage Fluctuation	<input checked="" type="checkbox"/> $V_{NOM} + 10\%$	<input checked="" type="checkbox"/> $V_{NOM} - 10\%$	

8-6-6. Result

Voltage dips	Result
100 %	A
60 %	B
30 %	B

Criterion	Remark
A	No degradation of function
B	Distortion of function
C	Error of function
Unrecoverable Failure	Loss of function

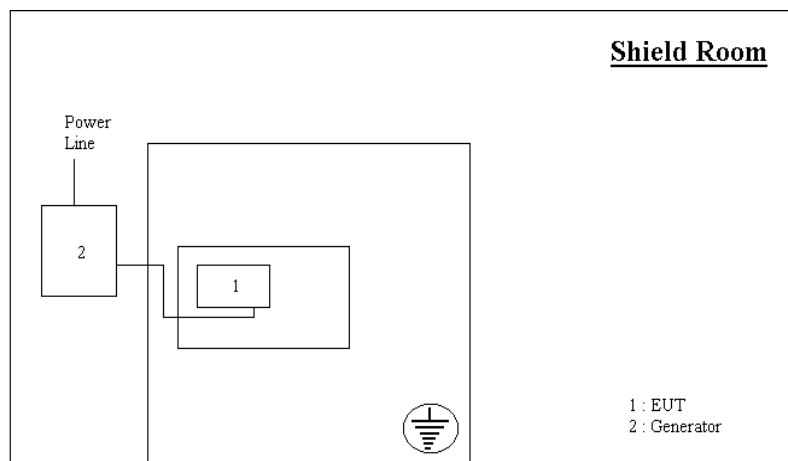
Remarks: Test Date: November 20, 2013

For 100 % voltage dips, The EUT was operated at the normal state during and after dips.

For 60 % voltage dips, The compressor operation's speed changed. After application of dips, the EUT was operated normally by itself.

For 30 % voltage dips, The compressor operation's speed changed. After application of dips, the EUT was operated normally by itself.

8-6-7. Test Setup



Test setup: Dips / Interruptions / Variations

