

Test report No: 6168986.51

TEST REPORT

Electromagnetic Compatibility (EMC)

Identification of item tested	EV charging power module
Trademark	
Model and /or type reference	MXR100040, MXR75050
Ratings	AC 285~475V, 50/60Hz
Applicant's name / address	Shijiazhuang Maxwell Technology Co., Ltd. Room 601, Building C, Zhongfang Yuntai Plaza, No.66 Tiyu North Street, Chang'an District Shijiazhuang 050000 Hebei P.R. China
Test method requested, standard	IEC 61851-21-2:2018 EN IEC 61851-21-2:2021
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Lei Chen Senior Project Manager 
Approved by (name / position & signature)	Adrian Shi Technical Supervisor 
Date of issue	2023-08-29
Report template No	TRF_IEC61851-21-2_EMV V1.0

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COMPETENCES AND GUARANTEES

EMTEK (SHENZHEN) CO., LTD. is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, EMTEK (SHENZHEN) CO., LTD. has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in CISPR 16-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

Uncertainties have been calculated according to the EMTEK (SHENZHEN) CO., LTD. internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. Refer to the Annex 1 for further information.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

<input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.			
<input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.			
Decimal separator used in this report	<input checked="" type="checkbox"/>	Comma (,)	<input type="checkbox"/> Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	:	Equipment Under Test
QP	:	Quasi-Peak
CAV	:	CISPR Average
AV	:	Average
CDN	:	Coupling Decoupling Network
SAC	:	Semi-Anechoic Chamber
OATS	:	Open Area Test Site
BW	:	Bandwidth
AM	:	Amplitude Modulation
PM	:	Pulse Modulation
HCP	:	Horizontal Coupling Plane
VCP	:	Vertical Coupling Plane
U_N	:	Nominal voltage
T_x	:	Transmitter
R_x	:	Receiver
N/A	:	Not Applicable
N/M	:	Not Measured
TEM	:	Transverse Electromagnetic Mode

DOCUMENT HISTORY

Report nr.	Date	Description
3126260.51	2021-02-22	First release.
6168986.51	2023-08-29	Updated the standard 'FprEN 61851-21-2: 2017' to 'EN IEC 61851-21-2:2021'.

REMARKS AND COMMENTS

The equipment under test (EUT) meet the essential requirements of the stated standard(s)/test(s).

The test results relate only to the samples tested.

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The test results stated in this report of model MXR100040 are also representative for model(s) MXR75050.

These models are identical in circuitry and electrical, mechanical and physical construction; the differences are the model number and output parameter.

This report is issued base on Dekra report No.: 3126260.51 to update the standard 'FprEN 61851-21-2: 2017' to 'EN IEC 61851-21-2:2021' and change address for applicant/manufacture. After technology evaluation, no additional test is required.

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item	EV charging power module
Model / Type number	MXR100040, MXR75050
Trademark.....	
Manufacturer.....	Shijiazhuang Maxwell Technology Co., Ltd. Room 601, Building C, Zhongfang Yuantai Plaza, No.66 Tiyu North Street, Chang'an District Shijiazhuang 050000 Hebei P.R. China

Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input checked="" type="checkbox"/>	AC: 285 ~ 475V, 50/60Hz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>	DC:					
	<input type="checkbox"/>	Battery:					
Rated Power	40KW						
Clock frequencies	≤ 108MHz						
Other parameters.....	N/A						
Software version	Not provided						
Hardware version.....	Not provided						
Dimensions in cm (W x H x D).....	Not provided						
Mounting position.....	<input type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input checked="" type="checkbox"/>	Other:					

No	Module/parts of test item	Type	Manufacturer
N/A	N/A	N/A	N/A

No	Documents as provided by the applicant - Description	File name	Issue date
N/A	N/A	N/A	N/A

Modifications to the test item during testing	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>	Supplemental Information
---	-------------------------------------	-----	--------------------------	--------------------------

Copy of marking plate:
N/A

1.2 The environment(s) in which the EUT is intended to be used

The equipment under test (EUT) is intended to be used in the following environment(s):

<input type="checkbox"/>	Residential (domestic) environment.
<input type="checkbox"/>	Commercial and light-industrial environment.
<input checked="" type="checkbox"/>	Environments other than residential
<input type="checkbox"/>	Healthcare environments (hospitals, clinics, doctor's offices)
<input type="checkbox"/>	Vehicular environment

1.3 Test data

Test Location	EMTEK (SHENZHEN) CO., LTD. Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China
Date of receipt of test item	2020-10-13
Date (s) of performance of tests	2020-10-21 to 2020-11-04

1.4 Classification according to IEC 61851-21-2

The equipment under test (EUT) is classified as follows, and this classification apply for the emission test :

<input checked="" type="checkbox"/>	Class A	Class A off-board electric vehicle charging systems is equipment suitable for use in all locations other than residential ones and those directly connected to a low voltage power supply network which supplies buildings used for residential purposes.
<input type="checkbox"/>	Class B	Class B off-board electric vehicle charging systems is equipment suitable for use in residential establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for residential purposes. In-cable control and protective devices (IC-CPD) and other mobile charging equipment shall be tested as off-board charging equipment meeting Class B emission requirements (residential).

The equipment under test (EUT) is classified as follows, and this classification apply for the immunity test :

<input type="checkbox"/>	Category 1	a.c. charging immunity requirements – Environments other than residential
<input type="checkbox"/>	Category 2	a.c. charging immunity requirements – Residential environments
<input checked="" type="checkbox"/>	Category 3	d.c. charging immunity requirements – Environments other than residential
<input type="checkbox"/>	Category 4	d.c. charging immunity requirements – Residential environments

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for testing	
		Emission	Immunity
1	Standby	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Load 20%	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	Load 80%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Supplemental information:</u>			

2.2 Port(s) of the EUT

Port name and description	Connected to / Termination	Cable		
		Length used during test [m]	Attached during test	Shielded
AC input port	AC supply	1.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPT port	Resistive Load	1.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
<u>Supplemental information:</u>				

2.3 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
Resistive Load	N/A	BSX	EMTEK
<u>Supplemental information:</u>			

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
IEC 61851-21-2	2018	Electric vehicle conductive charging system - Part 21-2: Electric vehicle requirements for conductive connection to an AC/DC supply – EMC requirements for off board electric vehicle charging systems
EN IEC 61851-21-2	2021	Electric vehicle conductive charging system - Part 21-2: Electric vehicle requirements for conductive connection to an AC/DC supply - EMC requirements for off board electric vehicle charging systems
EN61000-6-3 +A1 +AC	2007 2011 2012	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments
EN 61000-6-1	2007	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
CISPR 11 +A1	2015 2016	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
CISPR 16-2-1 +A1	2014 2017	Methods of measurement of disturbances and immunity – Conducted disturbance measurements.
CISPR 16-2-3	2016	Methods of measurement of disturbances and immunity – Radiated disturbance measurements.
CISPR 32	2015	Electromagnetic compatibility of multimedia equipment – Emission requirements.
IEC 61000-6-3	2011	Generic standards – Emission standard for residential, commercial and light-industrial environments
IEC 61000-6-1	2016	Generic standards – Emission standard for residential, commercial and light-industrial environments
IEC 61000-3-2	2018	Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
IEC 61000-3-12	2011	Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase.
IEC 61000-3-3 +A1	2013 2018	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.
IEC 61000-3-11	2017	Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection.
IEC 61000-4-2	2008	Electrostatic discharge immunity test.
IEC 61000-4-3 +A1 +A2	2006 2007 2010	Radiated, radio-frequency, electromagnetic field immunity test.
IEC 61000-4-4	2012	Electrical fast transient/burst immunity test.
IEC 61000-4-5	2014	Surge immunity test.
IEC 61000-4-6	2013	Immunity to conducted disturbances, induced by radio-frequency fields.
IEC 61000-4-8	2009	Power frequency magnetic field immunity test.

Standard	Year	Description
IEC 61000-4-11 A1	2004 2017	Voltage dips, short interruptions and voltage variations immunity tests.
IEC 61000-4-34 A1	2005 2009	Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16A per phase.

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

3.3 Overview of results

EMISSION TESTS – EN 61000-6-3			
Requirement – Test case	Basic standard(s)	Verdict	Remark
Conducted disturbance voltage at mains power input / output port(s)	CISPR 16-2-1	PASS	---
Conducted disturbance voltage at wired network port or Signal/control port	CISPR 16-2-1	PASS	---
Radiated electromagnetic disturbances (2 - 185KHz & 30 – 1000 MHz)	CISPR 16-2-3	PASS	---
Radiated electromagnetic disturbances (above 1 GHz)	CISPR 16-2-3	N/A	See 1)
Harmonic current emissions	IEC 61000-3-2 IEC 61000-3-12	PASS	---
Voltage changes, voltage fluctuations and flicker	IEC 61000-3-3 IEC 61000-3-11	PASS	---
Supplementary information:			
1) Highest internal frequency of the EUT ≤ 108MHz.			

IMMUNITY TESTS – EN 61000-6-1			
Requirement – Test case	Basic standard(s)	Verdict	Remark
Electrostatic discharge	IEC 61000-4-2	PASS	---
Radio-frequency electromagnetic fields	IEC 61000-4-3	PASS	---
Fast transients	IEC 61000-4-4	PASS	---
Surge transient	IEC 61000-4-5	PASS	---
Injected currents (radio-frequency common mode)	IEC 61000-4-6	PASS	---
Power frequency magnetic fields	IEC 61000-4-8	PASS	---
Voltage dips and short interruptions	IEC 61000-4-11 IEC 61000-4-34	PASS	---
Supplementary information:			

3.4 Test Matrix

EMISSION TESTS	Model / Type		
	Mode 1	Mode 2	Mode 3
Conducted disturbance voltage at mains power input / output port(s) (150 KHz – 30 MHz)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Conducted disturbance voltage at wired network port or Signal/control port (150 KHz – 30 MHz)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Radiated electromagnetic disturbances (2 - 185KHz & 30 – 1000 MHz)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Radiated electromagnetic disturbances (above 1GHz)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Harmonic current emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Voltage changes, voltage fluctuations and flicker	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Supplimentary: Information:</u>			

IMMUNITY TESTS	Model / Type		
	Mode 1	Mode 2	Mode 3
Electrostatic discharge	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radio-frequency electromagnetic fields	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fast transients	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Surges	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Injected currents (radio-frequency common mode)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power frequency magnetic field immunity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Voltage dips and short interruptions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Supplimentary: Information:</u>			

4 EMISSION TEST RESULTS

4.1 Conducted disturbance voltage – Mains power port(s)	VERDICT: PASS
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Standard	IEC 61851-21-2
Basic standard(s)	CISPR 16-2-1

Limits - Class A (a.c. mains power port)

Frequency range [MHz]	Rated input power of ≤ 20 kVA		Rated input power of >20 kVA to ≤ 75 kVA		Rated input power of >75 kVA		IF BW	Detector(s)
	Limit: QP [dB(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾	Limit: QP [dB(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾	Limit: QP [dB(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾		
0,15 - 0,50	79	66	100	90	130	120	9 KHz	QP, CAV
0,50 - 5,0	73	60	86	76	125	115	9 KHz	QP, CAV
5,0 - 30	73	60	90-73	80-60	115	105	9 KHz	QP, CAV

¹⁾ At the transition frequency, the lower limit applies.

Limits - Class B (a.c. mains power port)

Frequency range [MHz]	Limit: QP [dB(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾	IF BW	Detector(s)
0,15 - 0,50	66 - 56 ²⁾	56 - 46 ²⁾	9 KHz	QP, CAV
0,50 - 5,0	56	46	9 KHz	QP, CAV
5,0 - 30	60	50	9 KHz	QP, CAV

¹⁾ At the transition frequency, the lower limit applies.
²⁾ The limit decreases linearly with the logarithm of the frequency.

Limits - d.c. mains power port

Frequency range [MHz]	Rated input power of ≤ 75 kVA		Rated input power of >75 kVA		IF BW	Detector(s)
	Limit: QP [dB(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾	Limit: QP [dB(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾		
0,15 - 0,50	79	66	100	90	9 KHz	QP, CAV
0,50 - 5,0	73	60	86	76	9 KHz	QP, CAV
5,0 - 30	73	60	90-73	80-60	9 KHz	QP, CAV

¹⁾ At the transition frequency, the lower limit applies.

Limits - Class A equipment for AC CPT port

Frequency range [MHz]	Limit: QP [dB(μ V) ¹⁾	Limit: AV [dB(μ V) ¹⁾	IF BW	Detector(s)
0,15 - 0,50	79	66	9 KHz	QP, CAV
0,50 - 30	73	60	9 KHz	QP, CAV

Limits - Class B equipment for AC CPT port

Frequency range [MHz]	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾	IF BW	Detector(s)
0,15 - 0,50	66 – 56	56 - 46	9 KHz	QP, CAV
0,50 - 5,0	56	46	9 KHz	QP, CAV
5,0 - 30	60	50	9 KHz	QP, CAV

¹⁾ At the transition frequency, the lower limit applies.

Limits - DC CPT port

Frequency range [MHz]	Rated input power of ≤ 75 kVA		Rated input power of >75 kVA		IF BW	Detector(s)
	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾		
0,15 - 0,50	79	66	100	90	9 KHz	QP, CAV
0,50 - 5,0	73	60	86	76	9 KHz	QP, CAV
5,0 - 30	73	60	90-73	80-60	9 KHz	QP, CAV

¹⁾ At the transition frequency, the lower limit applies.

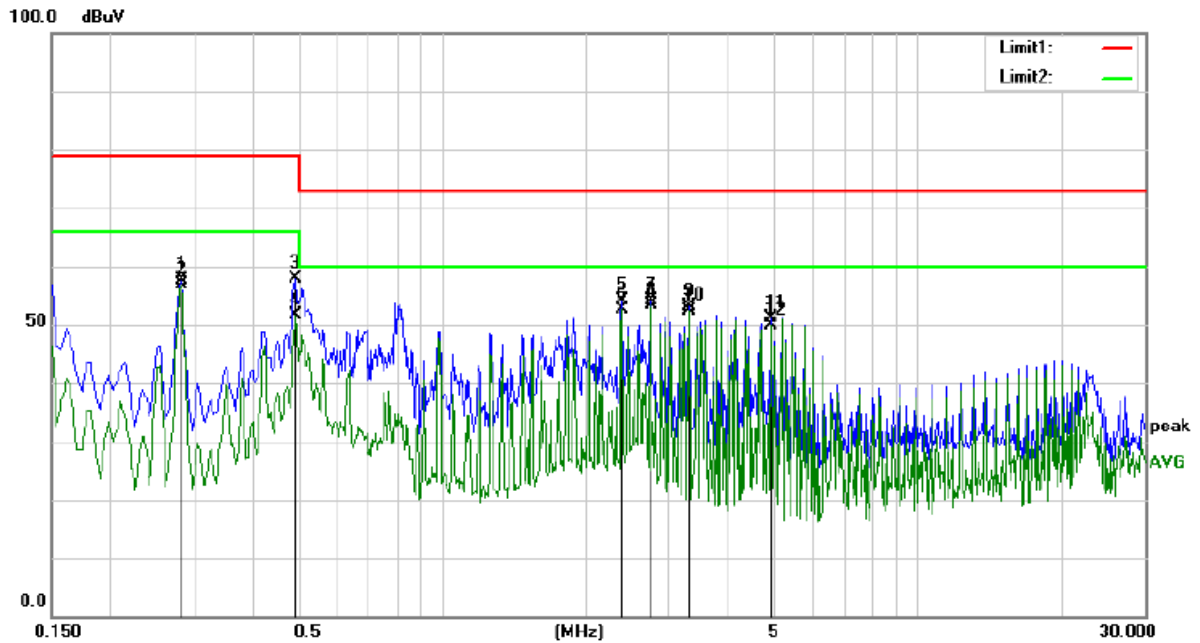
Performed measurements

Port under test		Terminal							
<input checked="" type="checkbox"/>	AC mains input port	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>	L1	<input checked="" type="checkbox"/>	L2	<input checked="" type="checkbox"/>	L3
<input type="checkbox"/>	AC CPT port	<input type="checkbox"/>	N	<input type="checkbox"/>	L1	<input type="checkbox"/>	L2	<input type="checkbox"/>	L3
<input checked="" type="checkbox"/>	DC CPT port	<input checked="" type="checkbox"/>	N			<input checked="" type="checkbox"/>	P		
Voltage – Mains [V]		400Vac							
Frequency – Mains [Hz]		50Hz							
Test method applied		<input checked="" type="checkbox"/>	Artificial mains network						
		<input type="checkbox"/>	Voltage probe						
Test setup		<input checked="" type="checkbox"/>	Table top	<input type="checkbox"/>	Artificial hand applied				
		<input type="checkbox"/>	Floor standing	<input type="checkbox"/>	Other:				
		Refer to the Annex 3 for test setup photo(s).							
Operating mode(s) used		Mode 2, Mode 3							
Remark		---							

See next page.

Measurement data	Port under test	AC mains input port
-------------------------	-----------------	---------------------

Operating mode / voltage / frequency used during the test	Mode 2 / 400 Vac / 50 Hz
---	--------------------------



Site Conduction #2

Phase: **L3**

Temperature: 25.0

Limit: (CE)IEC 61851 class A_QP

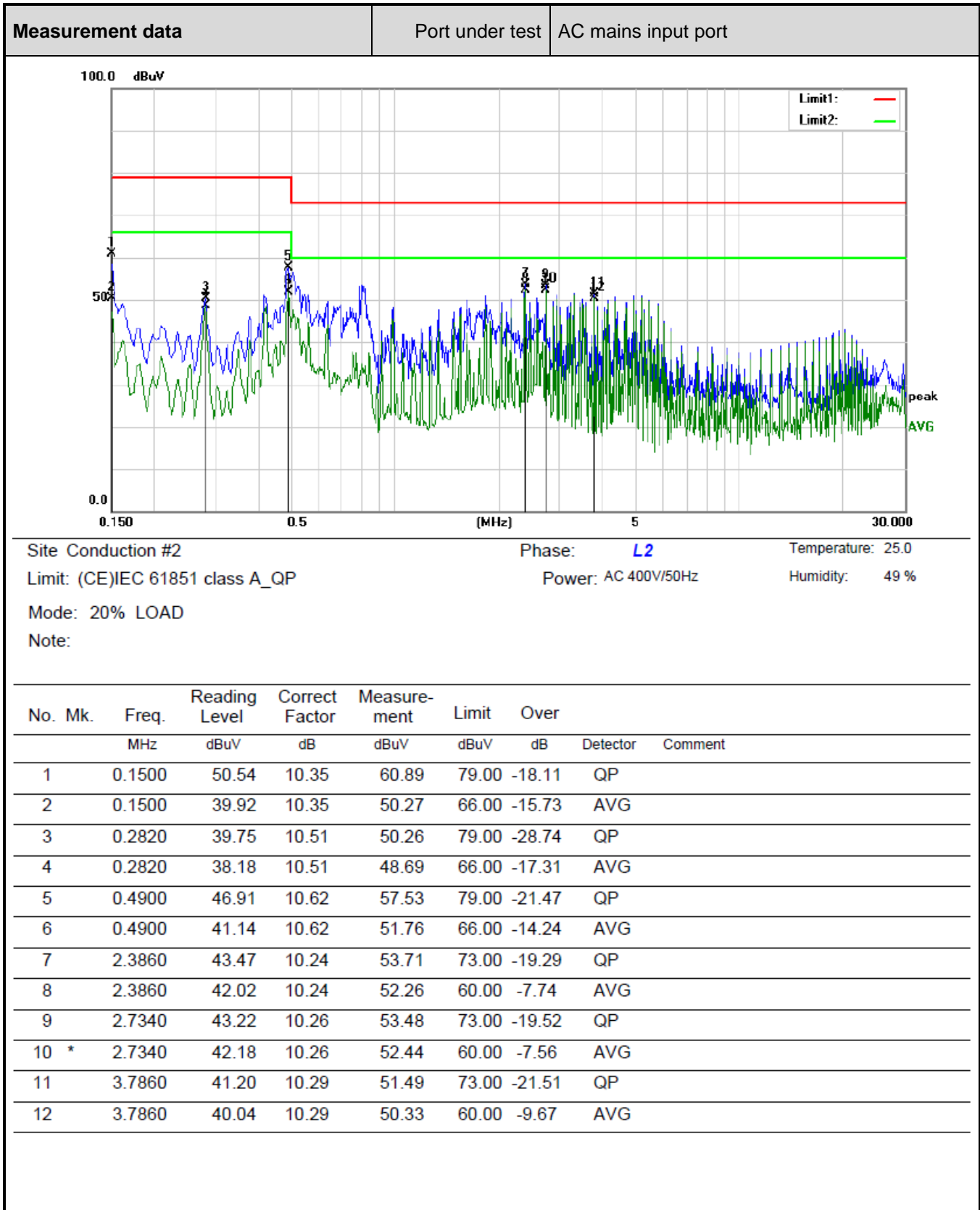
Power: AC 400V/50Hz

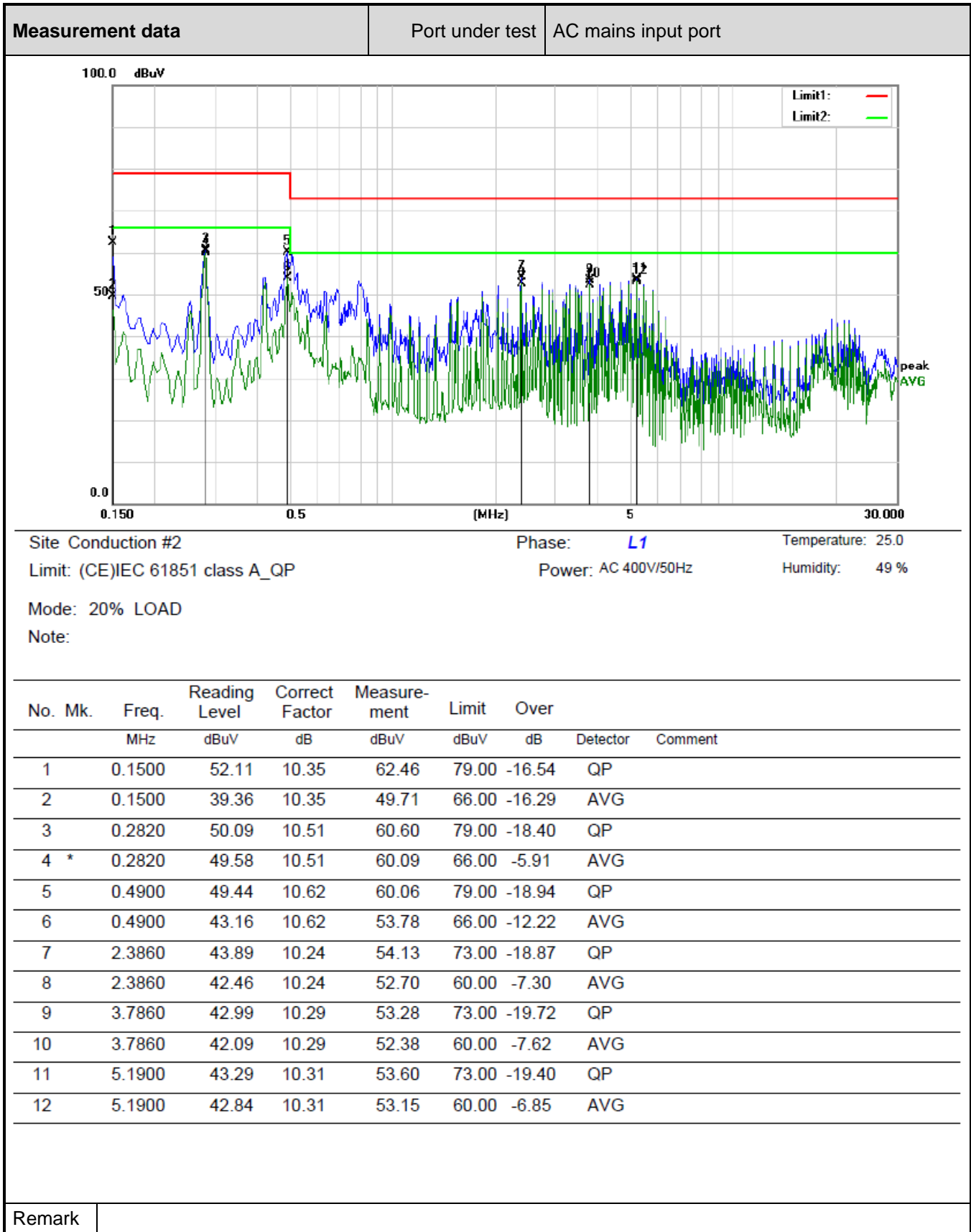
Humidity: 49 %

Mode: 20% LOAD

Note:

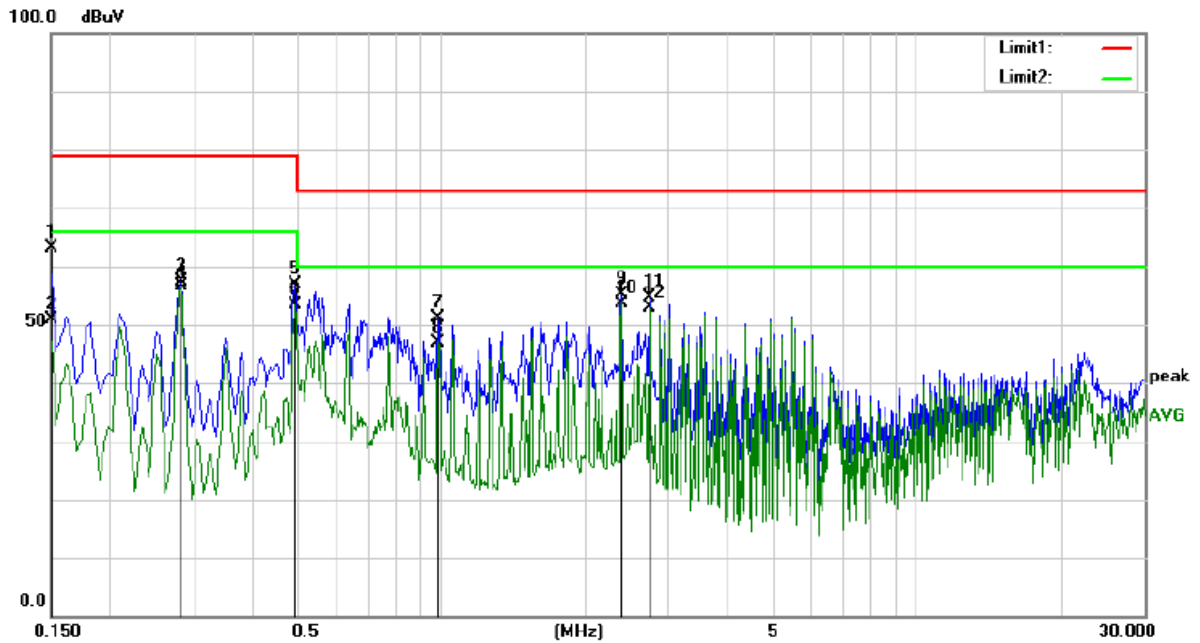
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2820	47.14	10.51	57.65	79.00	-21.35	QP	
2		0.2820	46.40	10.51	56.91	66.00	-9.09	AVG	
3		0.4900	47.18	10.62	57.80	79.00	-21.20	QP	
4		0.4900	40.94	10.62	51.56	66.00	-14.44	AVG	
5		2.3860	44.00	10.24	54.24	73.00	-18.76	QP	
6		2.3860	42.27	10.24	52.51	60.00	-7.49	AVG	
7		2.7380	43.99	10.26	54.25	73.00	-18.75	QP	
8	*	2.7380	43.06	10.26	53.32	60.00	-6.68	AVG	
9		3.2980	42.75	10.27	53.02	73.00	-19.98	QP	
10		3.2980	42.17	10.27	52.44	60.00	-7.56	AVG	
11		4.9100	40.92	10.31	51.23	73.00	-21.77	QP	
12		4.9100	39.45	10.31	49.76	60.00	-10.24	AVG	





Measurement data	Port under test	AC mains input port
-------------------------	-----------------	---------------------

Operating mode / voltage / frequency used during the test	Mode 3 / 400 Vac / 50 Hz
---	--------------------------



Site Conduction #2

Phase: L3

Temperature: 25.0

Limit: (CE)IEC 61851 class A_QP

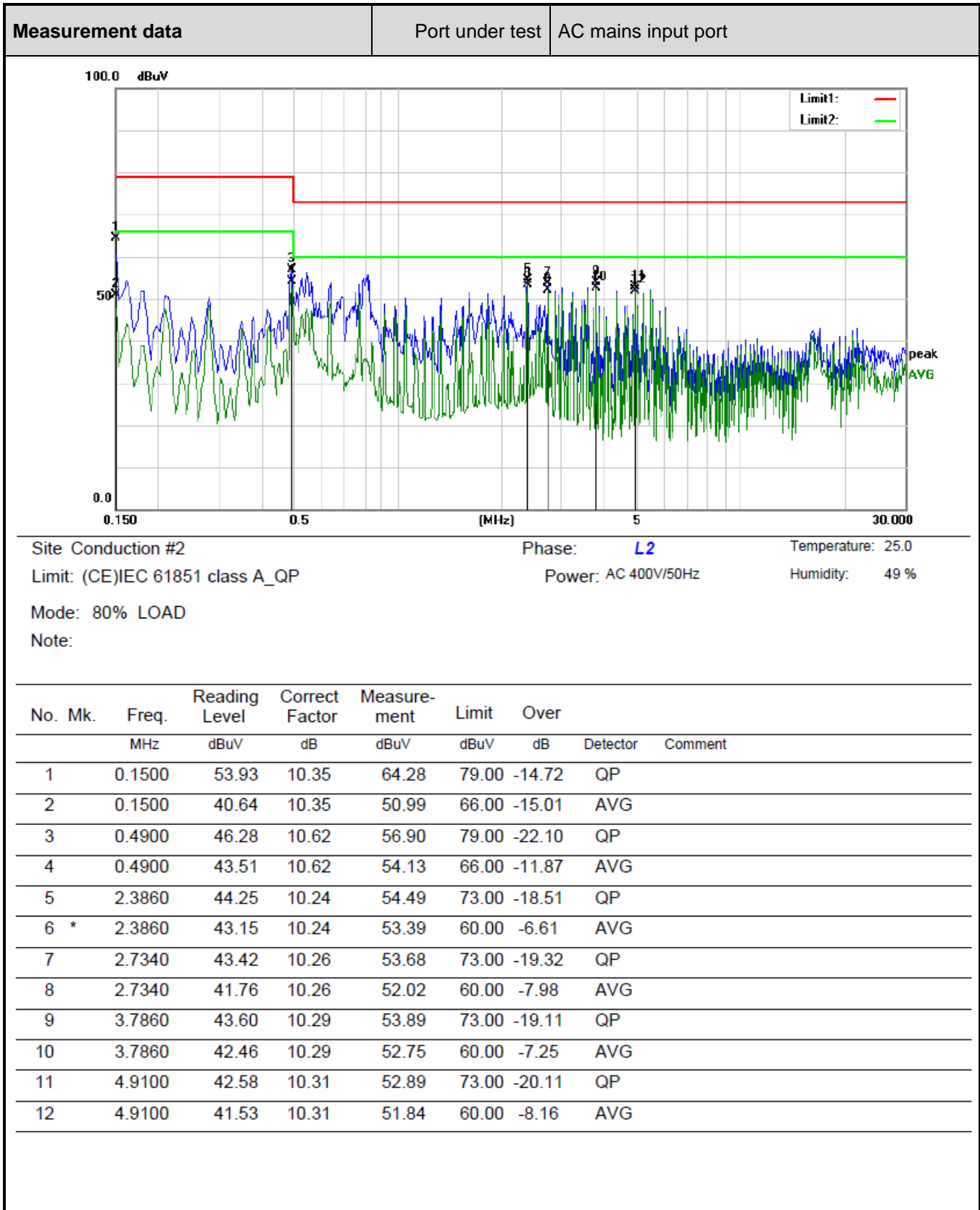
Power: AC 400V/50Hz

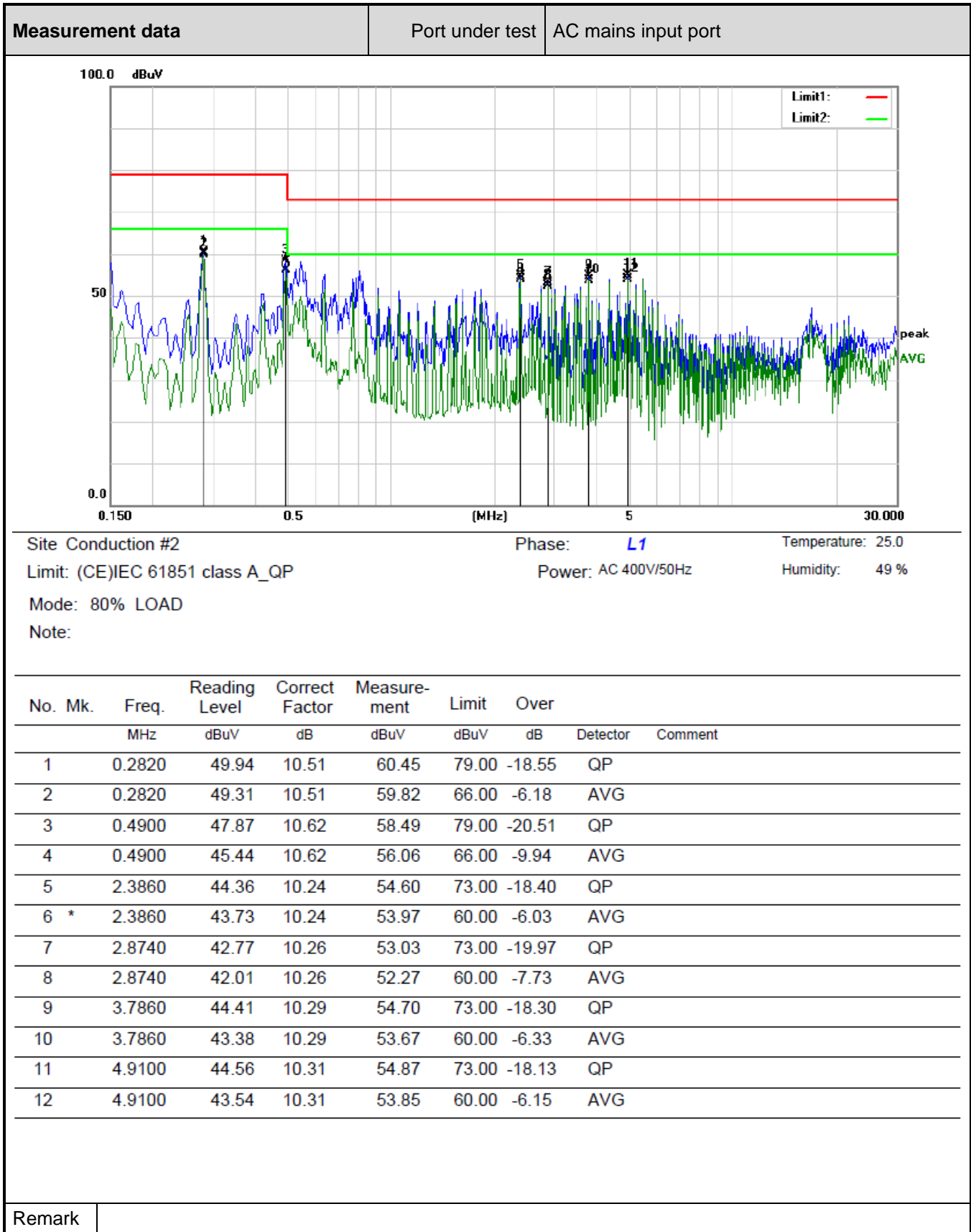
Humidity: 49 %

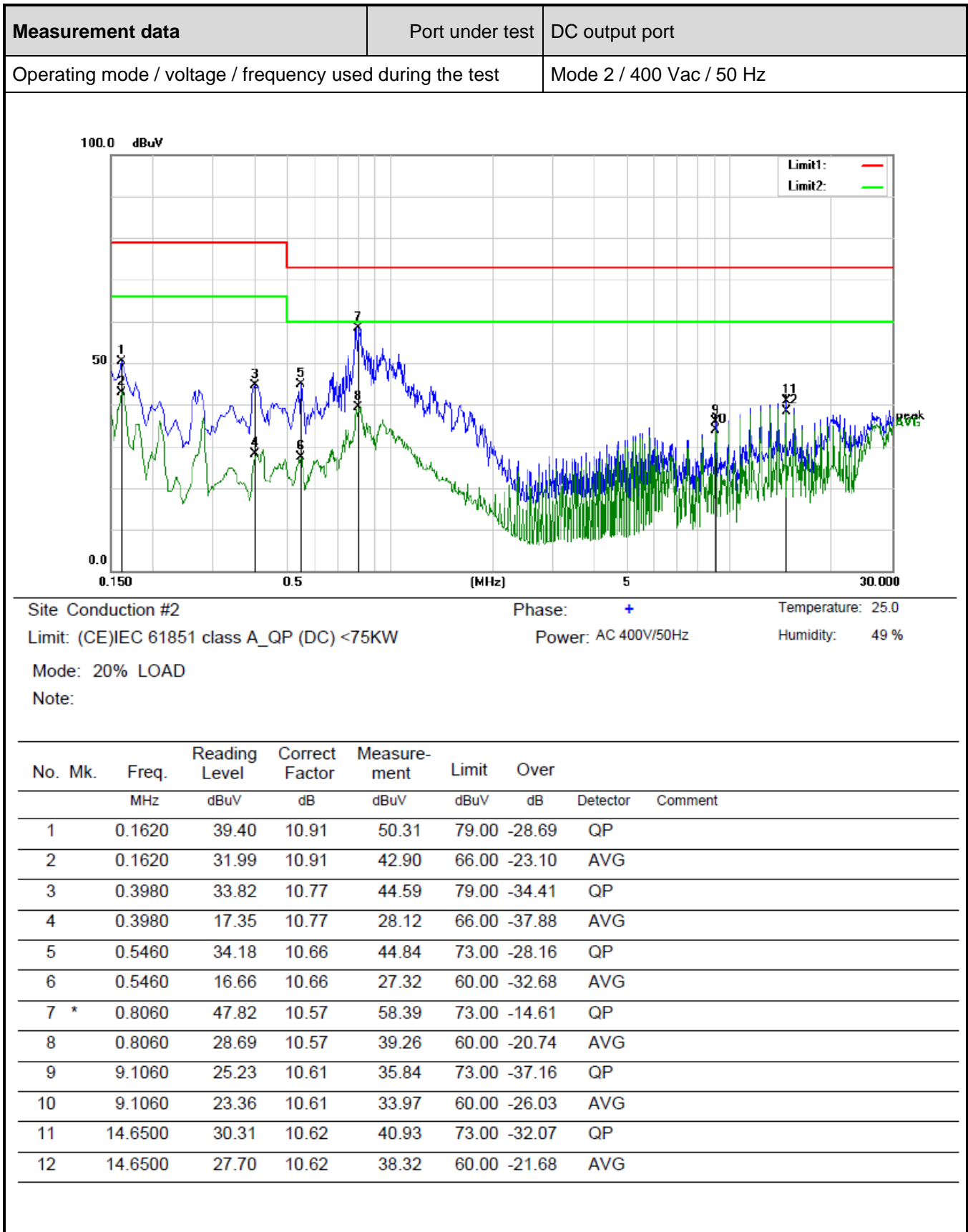
Mode: 80% LOAD

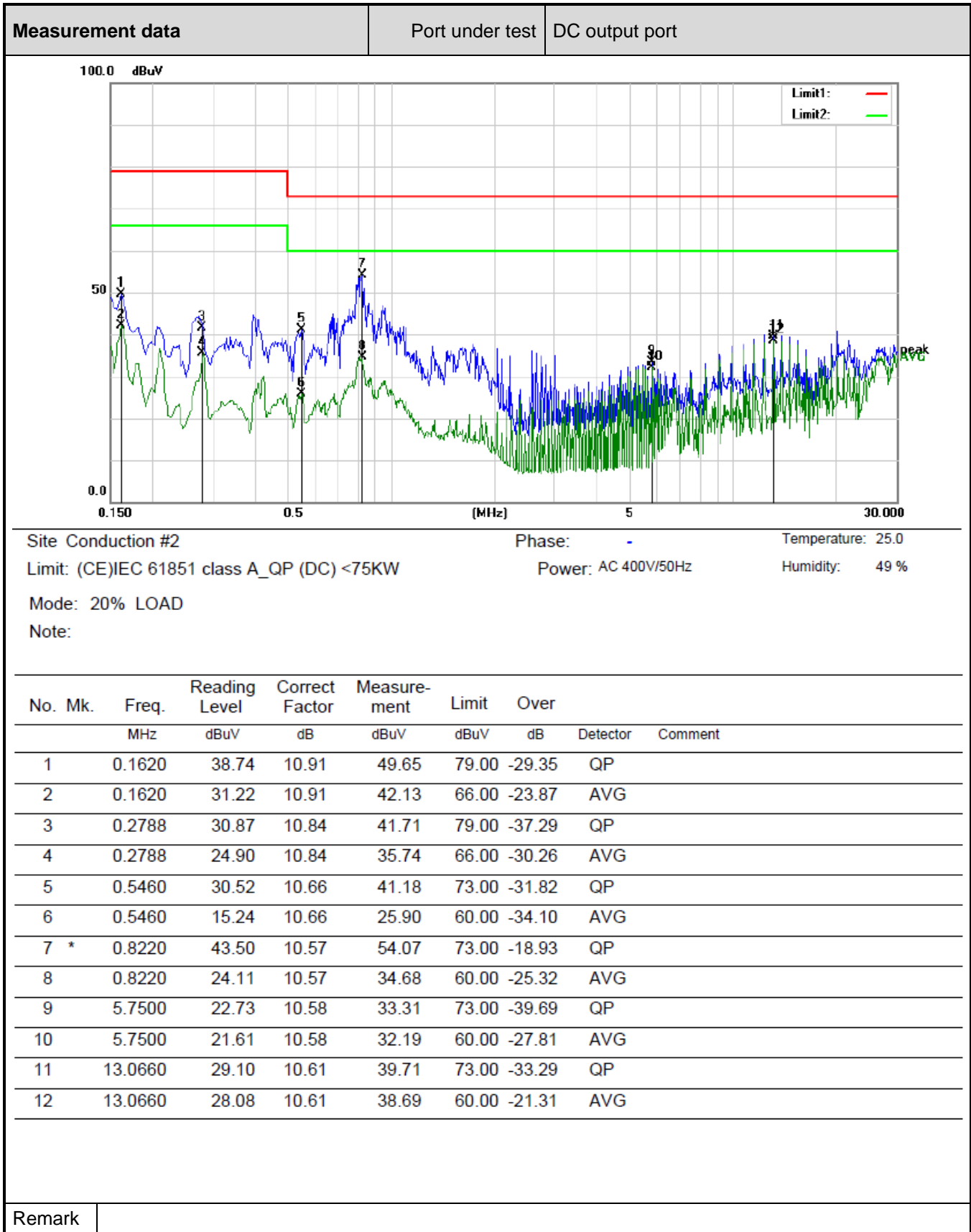
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	52.74	10.35	63.09	79.00	-15.91	QP	
2		0.1500	40.46	10.35	50.81	66.00	-15.19	AVG	
3		0.2820	46.88	10.51	57.39	79.00	-21.61	QP	
4		0.2820	46.21	10.51	56.72	66.00	-9.28	AVG	
5		0.4900	46.15	10.62	56.77	79.00	-22.23	QP	
6		0.4900	42.87	10.62	53.49	66.00	-12.51	AVG	
7		0.9820	40.96	10.27	51.23	73.00	-21.77	QP	
8		0.9820	36.73	10.27	47.00	60.00	-13.00	AVG	
9		2.3860	44.88	10.24	55.12	73.00	-17.88	QP	
10	*	2.3860	43.31	10.24	53.55	60.00	-6.45	AVG	
11		2.7340	44.43	10.26	54.69	73.00	-18.31	QP	
12		2.7340	42.74	10.26	53.00	60.00	-7.00	AVG	



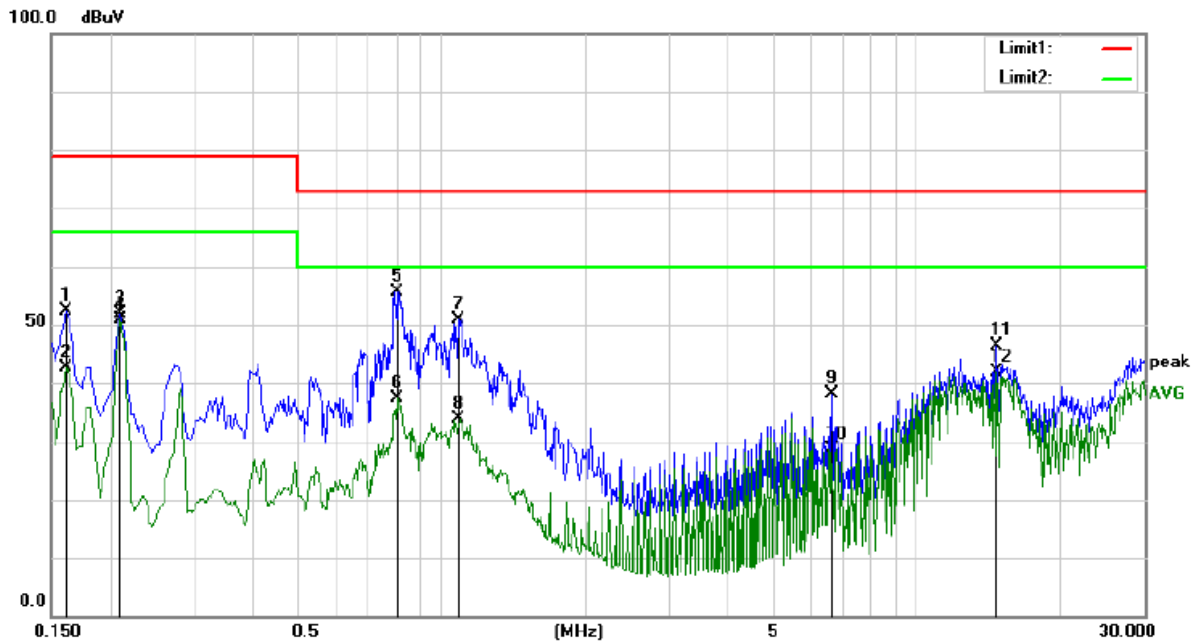






Measurement data	Port under test	DC output port
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Operating mode / voltage / frequency used during the test	Mode 3 / 400 Vac / 50 Hz
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Site Conduction #2

Phase: +

Temperature: 25.0

Limit: (CE)IEC 61851 class A_QP (DC) <75KW

Power: AC 400V/50Hz

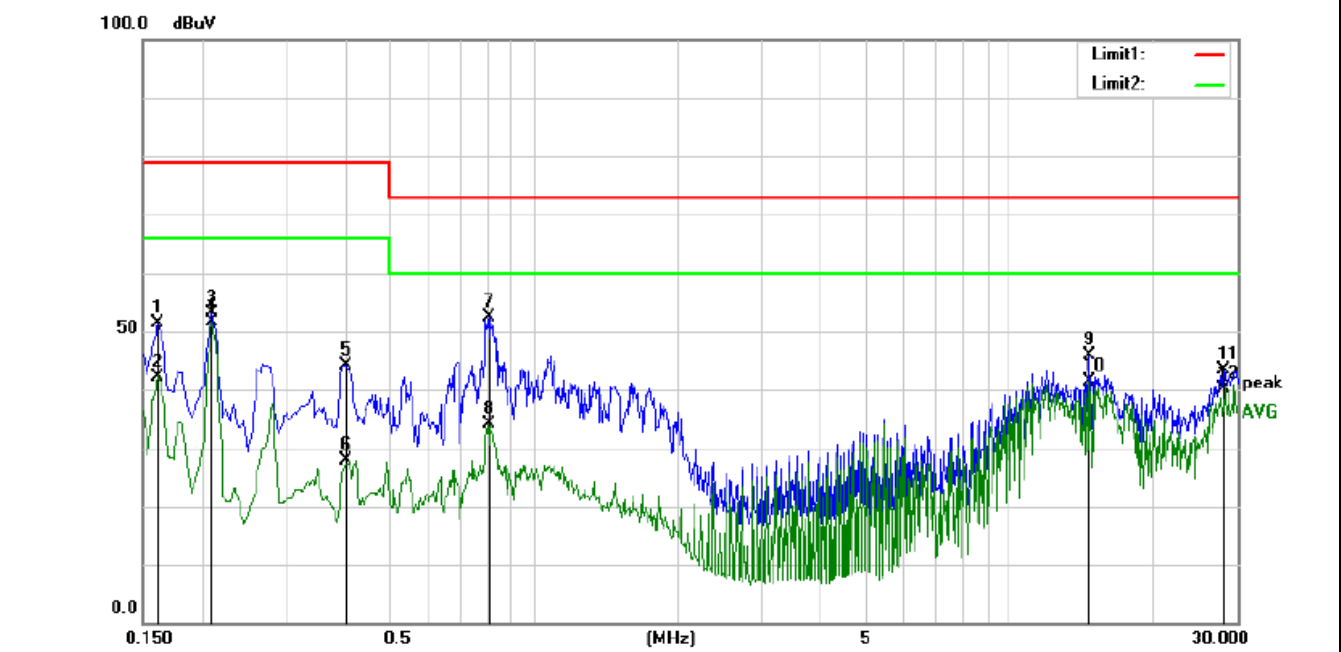
Humidity: 49 %

Mode: 80% LOAD

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1620	41.55	10.91	52.46	79.00	-26.54	QP	
2		0.1620	31.73	10.91	42.64	66.00	-23.36	AVG	
3		0.2100	40.95	10.89	51.84	79.00	-27.16	QP	
4	*	0.2100	40.05	10.89	50.94	66.00	-15.06	AVG	
5		0.8020	45.16	10.57	55.73	73.00	-17.27	QP	
6		0.8020	26.91	10.57	37.48	60.00	-22.52	AVG	
7		1.0820	40.30	10.56	50.86	73.00	-22.14	QP	
8		1.0820	23.22	10.56	33.78	60.00	-26.22	AVG	
9		6.5940	27.60	10.59	38.19	73.00	-34.81	QP	
10		6.5940	18.00	10.59	28.59	60.00	-31.41	AVG	
11		14.6500	35.72	10.62	46.34	73.00	-26.66	QP	
12		14.6500	31.21	10.62	41.83	60.00	-18.17	AVG	

Measurement data	Port under test	DC output port
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Site Conduction #2 Phase: - Temperature: 25.0
 Limit: (CE)IEC 61851 class A_QP (DC) <75KW Power: AC 400V/50Hz Humidity: 49 %
 Mode: 80% LOAD
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1620	40.47	10.91	51.38	79.00	-27.62	QP	
2		0.1620	31.34	10.91	42.25	66.00	-23.75	AVG	
3		0.2100	42.18	10.89	53.07	79.00	-25.93	QP	
4	*	0.2100	40.85	10.89	51.74	66.00	-14.26	AVG	
5		0.4020	33.33	10.77	44.10	79.00	-34.90	QP	
6		0.4020	17.20	10.77	27.97	66.00	-38.03	AVG	
7		0.8060	41.76	10.57	52.33	73.00	-20.67	QP	
8		0.8060	23.46	10.57	34.03	60.00	-25.97	AVG	
9		14.6500	35.26	10.62	45.88	73.00	-27.12	QP	
10		14.6500	30.77	10.62	41.39	60.00	-18.61	AVG	
11		28.1100	32.88	10.50	43.38	73.00	-29.62	QP	
12		28.1100	29.72	10.50	40.22	60.00	-19.78	AVG	

Remark

4.2 Asymmetric mode conducted emissions	VERDICT: PASS
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Standard	IEC 61851-21-2
Basic standard(s)	CISPR 16-2-1

Limits – Class A

Frequency range [MHz]	Coupling device						IF BW	Detector(s)
	AAN		CVP		Current Probe			
	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾	Limit: QP [dB(μA) ¹⁾	Limit: AV [dB(μA) ¹⁾		
0,15 - 0,50	97 – 87 ²⁾	84 – 74 ²⁾	97 – 87 ²⁾	84 – 74 ²⁾	53 – 43	40– 30	9 KHz	QP, CAV
0,50 - 30	87	74	87	74	43	74	9 KHz	QP, CAV

¹⁾ At the transition frequency, the lower limit applies.

²⁾ The limit decreases linearly with the logarithm of the frequency.

Limits – Class B

Frequency range [MHz]	Coupling device						IF BW	Detector(s)
	AAN		CVP		Current Probe			
	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾	Limit: QP [dB(μA) ¹⁾	Limit: AV [dB(μA) ¹⁾		
0,15 - 0,50	84 – 74 ²⁾	74 – 64 ²⁾	84 – 74 ²⁾	74 – 64 ²⁾	40– 30	30– 20	9 KHz	QP, CAV
0,50 - 30	74	64	74	64	30	20	9 KHz	QP, CAV

¹⁾ At the transition frequency, the lower limit applies.

²⁾ The limit decreases linearly with the logarithm of the frequency.

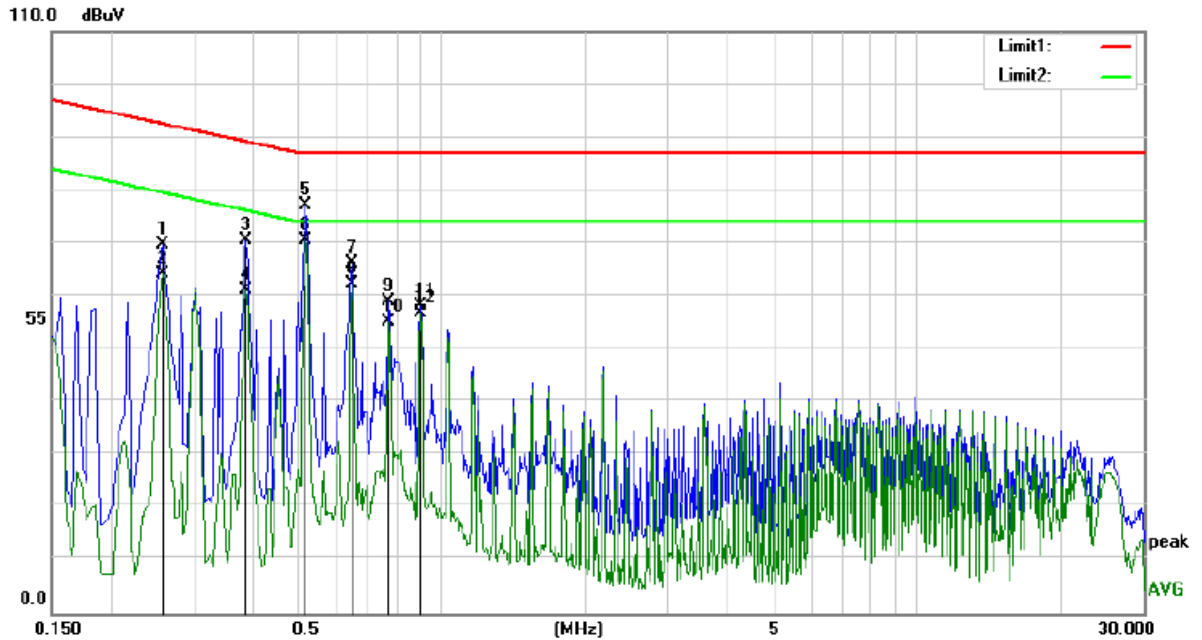
Performed measurements

Port under test			
<input type="checkbox"/>	LAN / Ethernet	<input checked="" type="checkbox"/>	Other: Signal
<input type="checkbox"/>	Other:	<input type="checkbox"/>	Other:
Voltage – Mains [V]		400 Vac	
Frequency – Mains [Hz]		50Hz	
Test method applied	<input checked="" type="checkbox"/>	ISN – Impedance Stabilisation Network	
	<input type="checkbox"/>	CDN according to EN / IEC 61000-4-6	
	<input type="checkbox"/>	Voltage probe	
	<input type="checkbox"/>	Current probe	
	<input type="checkbox"/>	Artificial mains network	
	<input type="checkbox"/>	Other:	
Test setup	<input checked="" type="checkbox"/>	Table top	<input type="checkbox"/> Artificial hand applied
	<input type="checkbox"/>	Floor standing	<input type="checkbox"/> Other:
	Refer to the Annex 3 for test setup photo(s).		
Operating mode(s) used		Mode 2, Mode 3	
Remark		All modes were tested, but only worst case was recorded in report.	

See next page.

Measurement data	Port under test	Signal port
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Operating mode / voltage / frequency used during the test	Mode 3 / 400 VAC / 50 Hz	
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Site Conduction #2

Phase:

Temperature: 25.0

Limit: (CE)EN55032 class A TELECOM_QP

Power: AC 400V/50Hz

Humidity: 49 %

Mode: 80% LOAD

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2580	59.96	9.68	69.64	92.50	-22.86	QP	
2		0.2580	54.56	9.68	64.24	79.50	-15.26	AVG	
3		0.3860	60.89	9.68	70.57	89.15	-18.58	QP	
4		0.3860	51.59	9.68	61.27	76.15	-14.88	AVG	
5		0.5180	67.44	9.61	77.05	87.00	-9.95	QP	
6	*	0.5180	60.86	9.61	70.47	74.00	-3.53	AVG	
7		0.6460	56.57	9.45	66.02	87.00	-20.98	QP	
8		0.6460	52.76	9.45	62.21	74.00	-11.79	AVG	
9		0.7740	49.59	9.45	59.04	87.00	-27.96	QP	
10		0.7740	45.76	9.45	55.21	74.00	-18.79	AVG	
11		0.9020	48.51	9.54	58.05	87.00	-28.95	QP	
12		0.9020	47.12	9.54	56.66	74.00	-17.34	AVG	

Remark

4.3	Radiated electromagnetic disturbances (2 – 185 KHz & 30 – 1000 MHz)	VERDICT: PASS
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Standard	IEC 61851-21-2
Basic standard(s)	CISPR 16-2-3
Test method	Antenna method according to CISPR 16-2-3 standard.
<u>Supplementary information:</u>	
According to the EN 55011 (CISPR 11) standard Table 1 footnote b) no limits apply to the fundamental and all other frequency components falling within the designated band of RF product(s)/unit(s).	

Limits – Class A equipment

Frequency [MHz]	Limit: QP [dB(μV/m) ¹⁾		IF BW	Detector
	@3 m.	@10 m.		
30 - 230	50	40	120 KHz	QP
230 - 1000	57	47	120 KHz	QP

¹⁾ At the transition frequency, the lower limit applies.

Limits – Class B equipment

Frequency [MHz]	Limit: QP [dB(μV/m) ¹⁾		IF BW	Detector
	@3 m.	@10 m.		
30 - 230	40	30	120 KHz	QP
230 - 1000	47	37	120 KHz	QP

¹⁾ At the transition frequency, the lower limit applies.

Limits

Frequency [kHz]	Limit: QP [dB(μV/m) ¹⁾	IF BW	Detector
	@1 m.		
2 - 10	62-60	200 Hz	QP
10 - 30	60	200 Hz	QP
30 - 75	60-95	200 Hz	QP
75 - 120	95-55	200 Hz	QP
120 - 140	55	200 Hz	QP
140 - 185	55-95	200 Hz	QP

1) The limit decreases linearly with frequency.
2) The limit increases linearly with frequency.
3) This test is applicable only to DC charging equipment

Performed measurements

Port under test	Enclosure	
Voltage – Mains [V]	400 Vac	
Frequency – Mains [Hz]	50Hz	
Test method applied	<input checked="" type="checkbox"/>	OATS or SAC with measurement distance [m]: 1 m.
	<input type="checkbox"/>	OATS or SAC with measurement distance [m]: 3 m.
	<input checked="" type="checkbox"/>	OATS or SAC with measurement distance [m]: 10 m.
Test setup	<input checked="" type="checkbox"/>	Equipment on a table of 80 cm height
	<input type="checkbox"/>	Equipment on the floor (insulated from ground plane)
	<input type="checkbox"/>	Other:
	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 2, Mode 3	
Remark	For 2 – 185 KHz, all modes were tested but only worst case was recorded in report.	

See next page.

Measurement data	<input checked="" type="checkbox"/>	Horizontal	<input checked="" type="checkbox"/>	Vertical
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Operating mode / voltage / frequency used during the test Mode 2 / 400 Vac / 50 Hz



Site: 10m Chamber 1# Polarization: **Horizontal** Temperature: 26
 Limit: (RE10M)IEC61851 Class A Power: AC 400V/50Hz Humidity: 60 %
 Mode: 20% load
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Ant. Factor dB/m	Pre Amp Gain dB	Cable loss dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	HI cm	Degree deg.	Comment
1		31.8427	42.80	10.69	43.45	0.95	10.99	40.00	-29.01	QP	400	25	
2		46.5030	40.18	13.24	43.5	1.12	11.04	40.00	-28.96	QP	174	35	
3		67.6751	43.27	9.96	43.56	1.34	11.01	40.00	-28.99	QP	400	332	
4	*	82.6482	61.02	8.04	43.6	1.46	26.92	40.00	-13.08	QP	400	222	
5		166.0680	47.92	9.5	43.89	2.11	15.64	40.00	-24.36	QP	400	324	
6		255.6231	46.64	12.78	43.22	2.78	18.98	47.00	-28.02	QP	400	243	

Measurement data	<input checked="" type="checkbox"/>	Horizontal	<input checked="" type="checkbox"/>	Vertical
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Operating mode / voltage / frequency used during the test Mode 3 / 400 Vac / 50 Hz

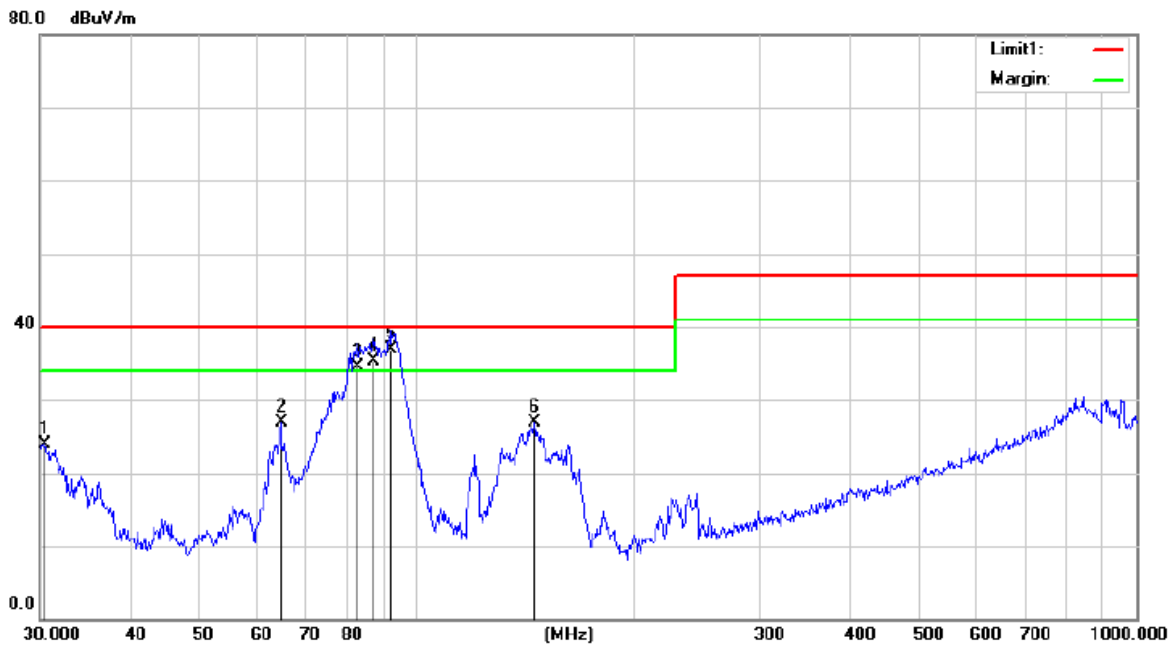


Site 10m Chamber 1# Polarization: **Horizontal** Temperature: 26
 Limit: (RE10M)IEC61851 Class A Power: AC 400V/50Hz Humidity: 60 %
 Mode: 80% load
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Ant. Factor dB/m	Pre Amp Gain dB	Cable loss dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	HI cm	Degree deg.	Comment
1		31.8427	43.46	10.69	43.45	0.95	11.65	40.00	-28.35	QP	175	229	
2		45.6948	40.23	13.27	43.49	1.11	11.12	40.00	-28.88	QP	175	255	
3	*	87.7248	61.36	8.7	43.61	1.5	27.95	40.00	-12.05	QP	400	359	
4		141.8262	48.77	9.11	43.8	1.94	16.02	40.00	-23.98	QP	175	272	
5		240.8304	47.25	12.46	43.43	2.68	18.96	47.00	-28.04	QP	400	312	
6		255.6231	46.78	12.78	43.22	2.78	19.12	47.00	-27.88	QP	400	93	

Measurement data	<input checked="" type="checkbox"/>	Horizontal	<input checked="" type="checkbox"/>	Vertical
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Operating mode / voltage / frequency used during the test Mode 3 / 400 Vac / 50 Hz



Site 10m Chamber 1#

Polarization: **Vertical**

Temperature: 26

Limit: (RE10M)IEC61851 Class A

Power: AC 400V/50Hz

Humidity: 60 %

Mode: 80% load

Note:

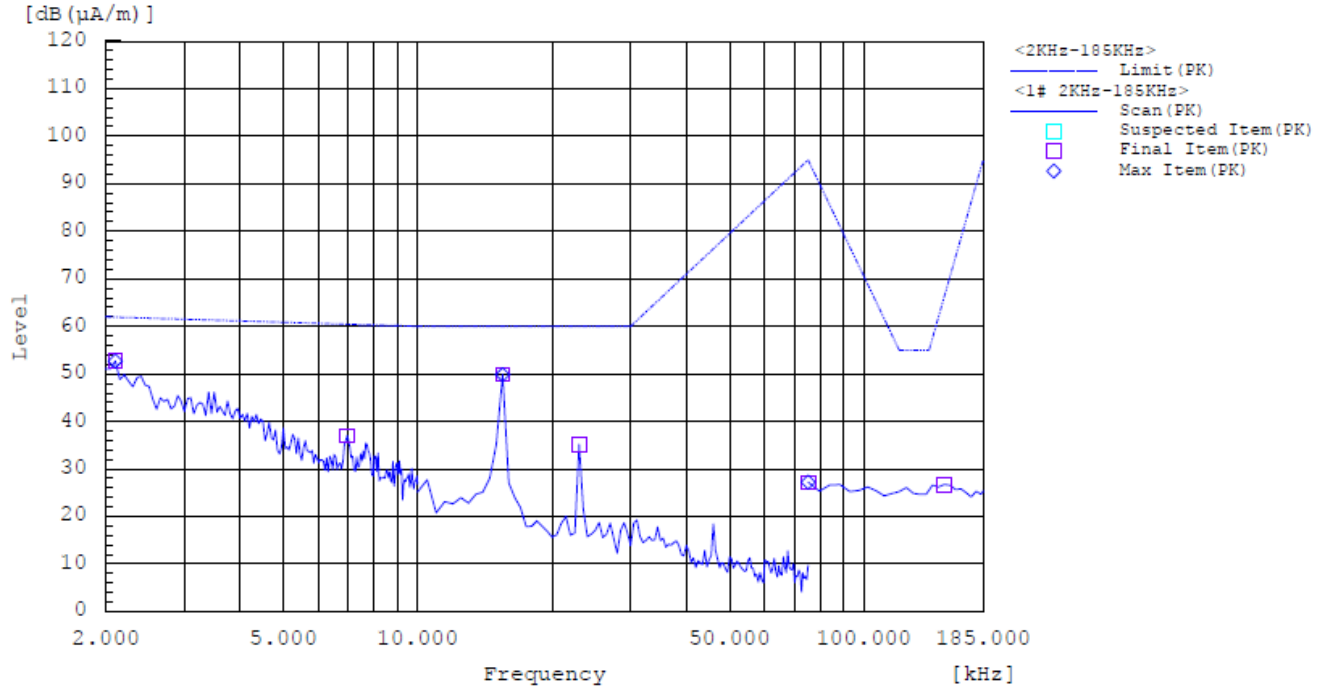
No.	Mk.	Freq. MHz	Reading Level dBuV	Ant. Factor dB/m	Pre Amp Gain dB	Cable loss dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	HI cm	Degree deg.	Comment
1		30.5306	55.62	10.38	43.27	1.27	24.00	40.00	-16.00	QP	100	274	
2		64.8865	55.96	12.4	43.35	1.83	26.84	40.00	-13.16	QP	199	292	
3	!	82.9385	66.79	9.05	43.39	2.05	34.50	40.00	-5.50	QP	100	101	
4	!	87.1117	67.97	8.72	43.4	2.11	35.40	40.00	-4.60	QP	100	52	
5	*	92.1388	69.15	8.98	43.41	2.18	36.90	40.00	-3.10	QP	100	330	
6		145.8611	57.77	9.76	43.48	2.78	26.83	40.00	-13.17	QP	100	106	

Remark

Measurement data

Operating mode / voltage / frequency used during the test

Mode 3 / 400 Vac / 50 Hz



Final Result

--- (PK) ---

No.	Frequency [kHz]	Reading [dB (µV)]	c.f [dB]	Result [dB (µA/m)]	Limit [dB (µA/m)]	Margin [dB]	Remark
1	2.100	8.6	44.1	52.7	61.9	9.2	
2	6.950	2.6	34.4	37.0	60.5	23.5	
3	15.500	21.7	28.2	49.9	60.0	10.1	
4	23.000	9.2	26.0	35.2	60.0	24.8	
5	75.000	5.5	21.7	27.2	95.0	67.8	
6	151.500	5.9	20.9	26.8	66.3	39.5	

Remark

4.4	Radiated electromagnetic disturbances (above 1 GHz)	VERDICT:	N/A
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Standard	IEC 61851-21-2		
Basic standard(s)	CISPR 16-2-3		
Test method	Antenna method according to CISPR 16-2-3 standard.		
Required highest frequency for radiated measurement			
	Highest internal frequency [f _x]		Highest measured frequency
<input checked="" type="checkbox"/>	f _x ≤ 108 MHz		1 GHz
<input type="checkbox"/>	108 MHz < f _x ≤ 500 MHz		2 GHz
<input type="checkbox"/>	500 MHz < f _x ≤ 1 GHz		5 GHz
<input type="checkbox"/>	f _x ≥ 1 GHz		5x f _x or up to 6 GHz

Limits - Class A equipment

Frequency [MHz]	@3 m		@10 m.		IF BW	Detector
	Limit: PK [dB(μV/m) ¹⁾	Limit: AV [dB(μV/m) ¹⁾	Limit: PK [dB(μV/m) ¹⁾	Limit: AV [dB(μV/m) ¹⁾		
1 - 3	76	56	66	46	1 MHz	PK, CAV
3 - 6	80	60	70	50	1 MHz	PK, CAV

¹⁾ At the transition frequency, the lower limit applies.

Limits - Class B equipment

Frequency [MHz]	@3 m		@10 m.		IF BW	Detector
	Limit: PK [dB(μV/m) ¹⁾	Limit: AV [dB(μV/m) ¹⁾	Limit: PK [dB(μV/m) ¹⁾	Limit: AV [dB(μV/m) ¹⁾		
1 - 3	70	50	60	40	1 MHz	PK, CAV
3 - 6	74	54	64	44	1 MHz	PK, CAV

¹⁾ At the transition frequency, the lower limit applies.

Performed measurements

Port under test	---		
Voltage – Mains [V]	---		
Frequency – Mains [Hz]	---		
Test method applied	<input type="checkbox"/>	Absorber-lined OATS or SAC with measurement distance [m]: 3 m.	
	<input type="checkbox"/>	Absorber-lined OATS or SAC with measurement distance [m]: 1 m.	
Test setup	<input type="checkbox"/>	Equipment on a table of 80 cm height	
	<input type="checkbox"/>	Equipment on the floor (insulated from ground plane)	
	<input type="checkbox"/>	Other:	
Refer to the Annex 3 for test setup photo(s).			
Operating mode(s) used	---		
Remark	---		

See next page.

Measurement data	<input type="checkbox"/>	Horizontal	<input type="checkbox"/>	Vertical
Operating mode / voltage / frequency used during the test		---		
Highest internal frequency of the EUT $\leq 108\text{MHz}$, so it no need to perform the test item.				
Remark				

4.5 Harmonic current emissions	VERDICT: PASS
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Standard	IEC 61851-21-2	
Basic standard	IEC 61000-3-2&12	
Exclusions (For these categories of equipment, limits are not specified in the EN 61000-3-2 standard)	<input type="checkbox"/>	Arc welding equipment intended for professional use.
	<input type="checkbox"/>	System(s) with nominal voltage(s) less than 220 V _{AC} (line-to-neutral).
	<input type="checkbox"/>	Equipment with rated power of ≤ 75 W (other than lighting equipment).
	<input type="checkbox"/>	Professional equipment with total rated power > 1 kW.
	<input type="checkbox"/>	Symmetrically controlled heating elements with a rated power ≥ 200 W.
	<input type="checkbox"/>	Independent dimmers for incandescent lamps with rated power ≤ 1 kW.

Classification (I _{input} ≤ 16 A)			
<input type="checkbox"/>	Class A	All apparatus not classified as Class B, C or D	
<input type="checkbox"/>	Class B	Portable tools	
<input type="checkbox"/>	Class C	<input type="checkbox"/>	Lighting equipment with active input power > 25 W
		<input type="checkbox"/>	Lighting equipment with active input power ≤ 25 W (First requirement, Table 3 column 2)
		<input type="checkbox"/>	Lighting equipment with active input power ≤ 25 W (Second requirement)
<input type="checkbox"/>	Class D	Personal computers, television receivers	

Classification (16 A ≤ I _{input} < 75 A)		
<input type="checkbox"/>	Table 2	other than balanced three-phase equipment
<input checked="" type="checkbox"/>	Table 3	balanced three-phase equipment
<input type="checkbox"/>	Table 4	balanced three-phase equipment under specified conditions (a,b,c)
<input type="checkbox"/>	Table 5	balanced three-phase equipment under specified conditions (d,e,f)

Performed measurements

Port under test	AC mains power input					
Voltage – Mains [V]	400 Vac					
Frequency – Mains [Hz]	50Hz					
Observation period	<input type="checkbox"/>	6.5 min.	<input checked="" type="checkbox"/>	2.5 min.	<input type="checkbox"/>	Other:
Version of measurement instrument standard used EN / IEC61000-4-7 (Cl. 7)	<input checked="" type="checkbox"/>	EN 61000-4-7:2002 + AM1:2009 (IEC 61000-4-7:2002+AM1:2008)				
	<input type="checkbox"/>	EN 61000-4-7:1991				
Control principle used in the EUT	<input type="checkbox"/>	Comply with the requirements of the Clause 6.1 (EN / IEC 61000-3-2).				
	<input checked="" type="checkbox"/>	Comply with the requirements of the Clause 6.1 (EN / IEC 61000-3-12).				
	<input type="checkbox"/>	Not comply with the requirements of the Clause 6.1 (EN / IEC 61000-3-2).				
	<input type="checkbox"/>	Not comply with the requirements of the Clause 6.1 (EN / IEC 61000-3-12).				
Operating mode(s) used	Mode 3					
Remark	---					

See next page.

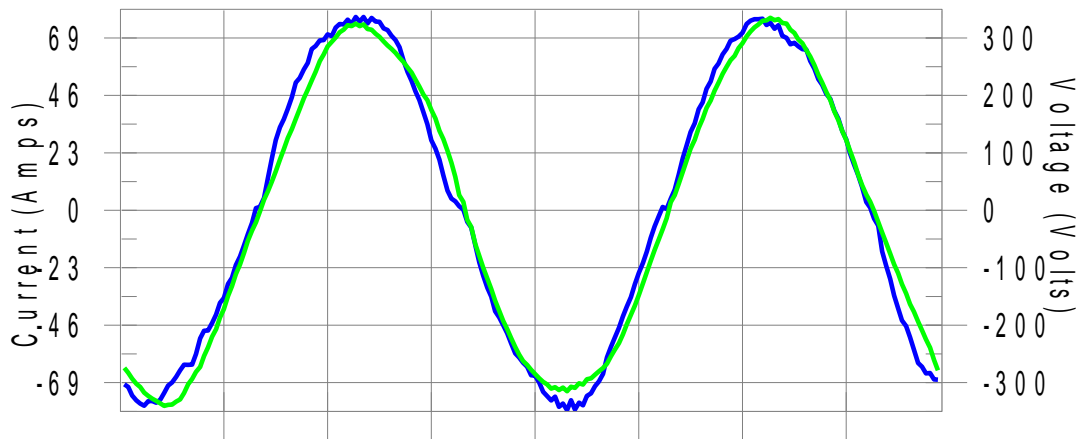
Measurement data	Port under test	AC input power-Line
Operating mode / voltage / frequency used during the test		Mode 3 / 400 Vac / 50 Hz

Harmonics – Per EN/IEC61000-3-12, Ed. 2.0(Phase A-Run time)

Test category: Table:2, Rsce=33, Test Margin: 100
 Test date: 2020/11/4 Start time: 10:19:35 End time: 10:22:18
 Test duration (min): 2.5 Data file name: WIN2106_H-000259.cts_data
 Comment: CHARGE MODE

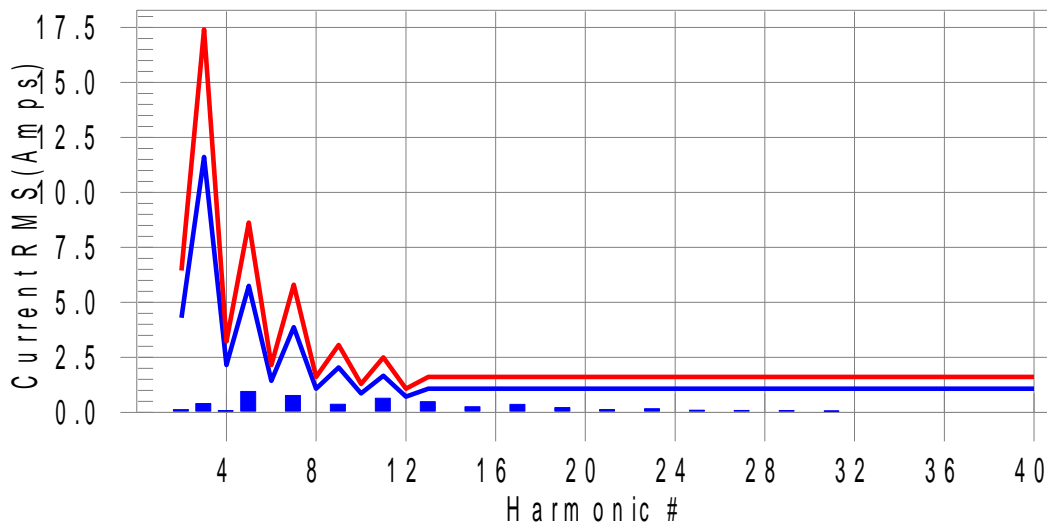
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 2 limit line

European Limits



Test result: Pass Worst harmonics H13-30.8% of 150% limit, H13-45% of 100% limit.

Measurement data		Port under test		AC input power-Line			
Current Test Result Summary (Phase A-Run time)							
Test category: Table:2, Rsce=33,		Test Margin: 100					
Test date: 2020/11/4		Start time: 10:19:35		End time: 10:22:18			
Test duration (min): 2.5		Data file name: WIN2106_H-000259.cts_data					
Comment: CHARGE MODE							
Test Result: Pass		Measured Iref: 53.748(Amps)		Source: Normal			
THC/Iref (%): 2.6		Limit (%): 23.0		PWHC/Iref (%): 0.0			
				PWHC Limit (%): 23.0			
Highest parameter values during test:							
V_RMS (Volts): 230.23		Frequency (Hz): 50.00					
I_Peak (Amps): 86.789		I_RMS (Amps): 54.064					
I_Fund (Amps): 53.653(avg)		Crest Factor: 1.610					
Power (Watts): 12367		Power Factor: 0.994					
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.121	4.300	2.8	0.614	6.450	9.5	Pass
3	0.402	11.610	3.5	0.441	17.414	2.5	Pass
4	0.077	2.150	3.6	0.709	3.225	22.0	Pass
5	0.952	5.751	16.6	0.974	8.627	11.3	Pass
6	0.022	1.433	1.6	0.055	2.150	2.5	Pass
7	0.767	3.870	19.8	0.919	5.805	15.8	Pass
8	0.038	1.075	3.5	0.244	1.612	15.1	Pass
9	0.369	2.042	18.0	0.391	3.064	12.8	Pass
10	0.037	0.860	4.3	0.167	1.290	13.0	Pass
11	0.644	1.666	38.6	0.701	2.499	28.1	Pass
12	0.033	0.717	4.6	0.048	1.075	4.4	Pass
13	0.484	1.075	45.0	0.497	1.612	30.8	Pass
14	0.038	N/A	N/A	0.065	N/A	N/A	N/A
15	0.253	N/A	N/A	0.287	N/A	N/A	N/A
16	0.038	N/A	N/A	0.050	N/A	N/A	N/A
17	0.364	N/A	N/A	0.384	N/A	N/A	N/A
18	0.043	N/A	N/A	0.058	N/A	N/A	N/A
19	0.215	N/A	N/A	0.238	N/A	N/A	N/A
20	0.038	N/A	N/A	0.051	N/A	N/A	N/A
21	0.130	N/A	N/A	0.143	N/A	N/A	N/A
22	0.031	N/A	N/A	0.043	N/A	N/A	N/A
23	0.164	N/A	N/A	0.192	N/A	N/A	N/A
24	0.035	N/A	N/A	0.074	N/A	N/A	N/A
25	0.097	N/A	N/A	0.118	N/A	N/A	N/A
26	0.029	N/A	N/A	0.043	N/A	N/A	N/A
27	0.088	N/A	N/A	0.100	N/A	N/A	N/A
28	0.017	N/A	N/A	0.026	N/A	N/A	N/A
29	0.081	N/A	N/A	0.105	N/A	N/A	N/A
30	0.017	N/A	N/A	0.027	N/A	N/A	N/A
31	0.059	N/A	N/A	0.079	N/A	N/A	N/A
32	0.017	N/A	N/A	0.040	N/A	N/A	N/A
33	0.052	N/A	N/A	0.059	N/A	N/A	N/A
34	0.013	N/A	N/A	0.019	N/A	N/A	N/A
35	0.039	N/A	N/A	0.052	N/A	N/A	N/A
36	0.013	N/A	N/A	0.025	N/A	N/A	N/A
37	0.028	N/A	N/A	0.050	N/A	N/A	N/A
38	0.032	N/A	N/A	0.039	N/A	N/A	N/A
39	0.020	N/A	N/A	0.027	N/A	N/A	N/A
40	0.021	N/A	N/A	0.026	N/A	N/A	N/A
<i>Note: Measured I-ref was applied for this test.</i>							

Measurement data	Port under test	AC input power-Line		
Voltage Source Verification Data (Phase A-Run time)				
Test category: Table:2, Rsce=33, Test Margin: 100 Test date: 2020/11/4 Start time: 10:19:35 End time: 10:22:18 Test duration (min): 2.5 Data file name: WIN2106_H-000259.cts_data Comment: CHARGE MODE				
Test Result: Pass Source qualification: Normal Measured source distortion is within the requirements of the standards Measurements are compliant with IEC/EN61000-3-12 Ed. 2.0 & IEC/EN61000-4-7 Ed. 2.1				
Highest parameter values during test:				
Voltage (Vrms): 230.23 Frequency (Hz): 50.00 I_Peak (Amps): 86.789 I_RMS (Amps): 54.064 I_Fund (Amps): 53.653(avg) Crest Factor: 1.610 Power (Watts): 12367 Power Factor: 0.994				
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.321	0.921	34.87	OK
3	0.312	2.877	10.86	OK
4	0.227	0.921	24.70	OK
5	0.218	3.453	6.32	OK
6	0.149	0.921	16.15	OK
7	0.263	2.877	9.14	OK
8	0.218	0.921	23.68	OK
9	0.108	1.381	7.84	OK
10	0.215	0.921	23.33	OK
11	0.297	1.611	18.41	OK
12	0.081	0.691	11.71	OK
13	0.259	1.381	18.73	OK
14	0.092	0.691	13.33	OK
15	0.219	0.691	31.78	OK
16	0.134	0.691	19.42	OK
17	0.261	0.690	37.85	OK
18	0.114	0.691	16.44	OK
19	0.190	0.691	27.50	OK
20	0.121	0.691	17.56	OK
21	0.201	0.691	29.10	OK
22	0.129	0.690	18.61	OK
23	0.217	0.690	31.40	OK
24	0.138	0.690	19.96	OK
25	0.151	0.691	21.89	OK
26	0.133	0.691	19.20	OK
27	0.146	0.690	21.10	OK
28	0.074	0.690	10.72	OK
29	0.154	0.690	22.25	OK
30	0.087	0.691	12.56	OK
31	0.122	0.691	17.68	OK
32	0.098	0.691	14.25	OK
33	0.112	0.691	16.20	OK
34	0.079	0.690	11.39	OK
35	0.103	0.691	14.86	OK
36	0.071	0.691	10.33	OK
37	0.088	0.691	12.75	OK
38	0.107	0.691	15.55	OK
39	0.108	0.690	15.66	OK
40	0.097	0.690	13.99	OK

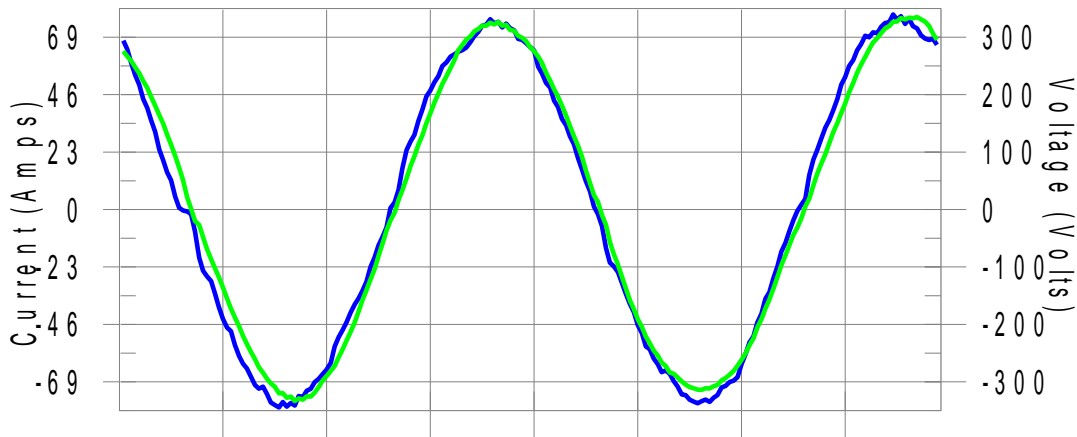
Measurement data	Port under test	AC input power-Line
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Harmonics – Per EN/IEC61000-3-12, Ed. 2.0(Phase B-Run time)

Test category: Table:2, Rsce=33, Test Margin: 100
 Test date: 2020/11/4 Start time: 10:19:35 End time: 10:22:18
 Test duration (min): 2.5 Data file name: WIN2106_H-000259.cts_data
 Comment: CHARGE MODE

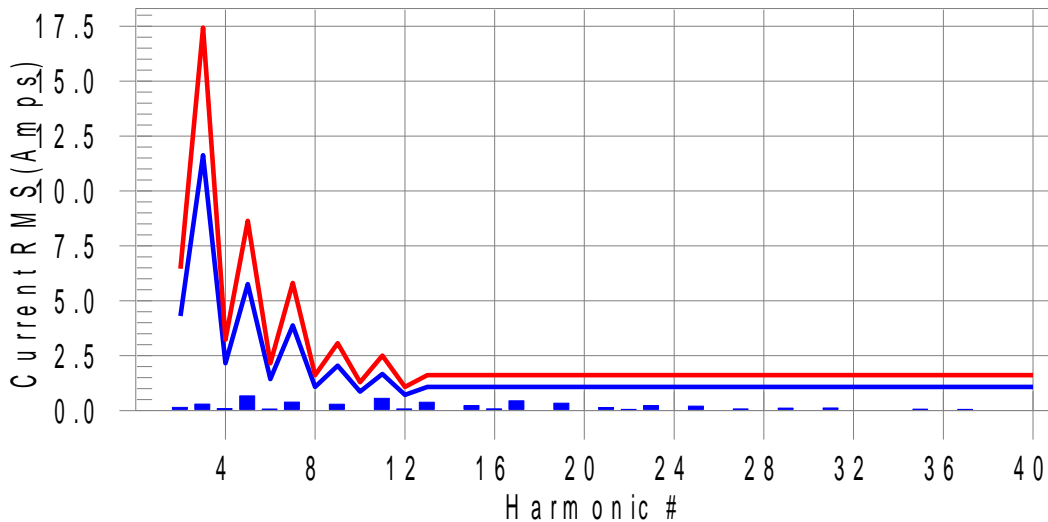
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 2 limit line

European Limits



Test result: Pass Worst harmonics H13-26.1% of 150% limit, H13-35.4% of 100% limit.

Measurement data		Port under test		AC input power-Line			
Current Test Result Summary (Phase B-Run time)							
Test category: Table:2, Rsce=33,		Test Margin: 100					
Test date: 2020/11/4		Start time: 10:19:35		End time: 10:22:18			
Test duration (min): 2.5		Data file name: WIN2106_H-000259.cts_data					
Comment: CHARGE MODE							
Test Result: Pass		Measured Iref: 53.819(Amps)		Source: Normal			
THC/Iref (%): 1.7		Limit (%): 23.0		PWHC/Iref (%): 0.0		PWHC Limit (%): 23.0	
Highest parameter values during test:							
V_RMS (Volts): 230.20		Frequency (Hz): 50.00					
I_Peak (Amps): 86.501		I_RMS (Amps): 54.148					
I_Fund (Amps): 53.751(avg)		Crest Factor: 1.596					
Power (Watts): 12387		Power Factor: 0.994					
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.146	4.306	3.4	0.720	6.458	11.1	Pass
3	0.295	11.625	2.5	0.345	17.437	2.0	Pass
4	0.088	2.153	4.1	0.586	3.229	18.1	Pass
5	0.671	5.759	11.6	0.710	8.638	8.2	Pass
6	0.064	1.435	4.4	0.122	2.153	5.7	Pass
7	0.387	3.875	10.0	0.570	5.812	9.8	Pass
8	0.031	1.076	2.9	0.163	1.615	10.1	Pass
9	0.292	2.045	14.3	0.317	3.068	10.3	Pass
10	0.051	0.861	5.9	0.265	1.292	20.5	Pass
11	0.561	1.668	33.6	0.624	2.503	24.9	Pass
12	0.069	0.718	9.6	0.078	1.076	7.2	Pass
13	0.381	1.076	35.4	0.422	1.615	26.1	Pass
14	0.050	N/A	N/A	0.070	N/A	N/A	N/A
15	0.228	N/A	N/A	0.250	N/A	N/A	N/A
16	0.077	N/A	N/A	0.088	N/A	N/A	N/A
17	0.445	N/A	N/A	0.463	N/A	N/A	N/A
18	0.048	N/A	N/A	0.064	N/A	N/A	N/A
19	0.337	N/A	N/A	0.350	N/A	N/A	N/A
20	0.038	N/A	N/A	0.054	N/A	N/A	N/A
21	0.138	N/A	N/A	0.157	N/A	N/A	N/A
22	0.055	N/A	N/A	0.071	N/A	N/A	N/A
23	0.230	N/A	N/A	0.270	N/A	N/A	N/A
24	0.030	N/A	N/A	0.039	N/A	N/A	N/A
25	0.203	N/A	N/A	0.214	N/A	N/A	N/A
26	0.033	N/A	N/A	0.048	N/A	N/A	N/A
27	0.073	N/A	N/A	0.083	N/A	N/A	N/A
28	0.020	N/A	N/A	0.028	N/A	N/A	N/A
29	0.111	N/A	N/A	0.120	N/A	N/A	N/A
30	0.014	N/A	N/A	0.020	N/A	N/A	N/A
31	0.120	N/A	N/A	0.131	N/A	N/A	N/A
32	0.019	N/A	N/A	0.028	N/A	N/A	N/A
33	0.039	N/A	N/A	0.046	N/A	N/A	N/A
34	0.018	N/A	N/A	0.026	N/A	N/A	N/A
35	0.058	N/A	N/A	0.071	N/A	N/A	N/A
36	0.013	N/A	N/A	0.022	N/A	N/A	N/A
37	0.053	N/A	N/A	0.064	N/A	N/A	N/A
38	0.017	N/A	N/A	0.024	N/A	N/A	N/A
39	0.023	N/A	N/A	0.030	N/A	N/A	N/A
40	0.033	N/A	N/A	0.043	N/A	N/A	N/A
<i>Note: Measured I-ref was applied for this test.</i>							

Measurement data		Port under test	AC input power-Line		
Voltage Source Verification Data (Phase B-Run time)					
Test category: Table:2, Rsce=33,		Test Margin: 100			
Test date: 2020/11/4		Start time: 10:19:35		End time: 10:22:18	
Test duration (min): 2.5		Data file name: WIN2106_H-000259.cts_data			
Comment: CHARGE MODE					
Test Result: Pass		Source qualification: Normal			
Measured source distortion is within the requirements of the standards					
Measurements are compliant with IEC/EN61000-3-12 Ed. 2.0 & IEC/EN61000-4-7 Ed. 2.1					
Highest parameter values during test:					
Voltage (Vrms): 230.20		Frequency (Hz): 50.00			
I_Peak (Amps): 86.501		I_RMS (Amps): 54.148			
I_Fund (Amps): 53.751(avg)		Crest Factor: 1.596			
Power (Watts): 12387		Power Factor: 0.994			
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status	
2	0.321	0.921	34.83	OK	
3	0.297	2.876	10.32	OK	
4	0.265	0.920	28.77	OK	
5	0.142	3.452	4.12	OK	
6	0.192	0.921	20.86	OK	
7	0.219	2.876	7.63	OK	
8	0.155	0.920	16.79	OK	
9	0.333	1.381	24.12	OK	
10	0.249	0.920	27.01	OK	
11	0.267	1.611	16.54	OK	
12	0.095	0.690	13.79	OK	
13	0.278	1.381	20.16	OK	
14	0.111	0.690	16.02	OK	
15	0.277	0.690	40.16	OK	
16	0.154	0.690	22.30	OK	
17	0.292	0.691	42.24	OK	
18	0.122	0.690	17.61	OK	
19	0.252	0.690	36.52	OK	
20	0.108	0.691	15.58	OK	
21	0.142	0.690	20.57	OK	
22	0.126	0.690	18.20	OK	
23	0.249	0.690	36.04	OK	
24	0.098	0.690	14.14	OK	
25	0.235	0.690	34.07	OK	
26	0.087	0.690	12.66	OK	
27	0.104	0.690	15.08	OK	
28	0.062	0.690	8.98	OK	
29	0.181	0.690	26.21	OK	
30	0.062	0.690	9.02	OK	
31	0.189	0.690	27.33	OK	
32	0.072	0.690	10.37	OK	
33	0.110	0.690	15.98	OK	
34	0.067	0.690	9.72	OK	
35	0.129	0.690	18.67	OK	
36	0.067	0.690	9.67	OK	
37	0.123	0.690	17.87	OK	
38	0.083	0.690	12.08	OK	
39	0.089	0.690	12.94	OK	
40	0.103	0.690	14.94	OK	

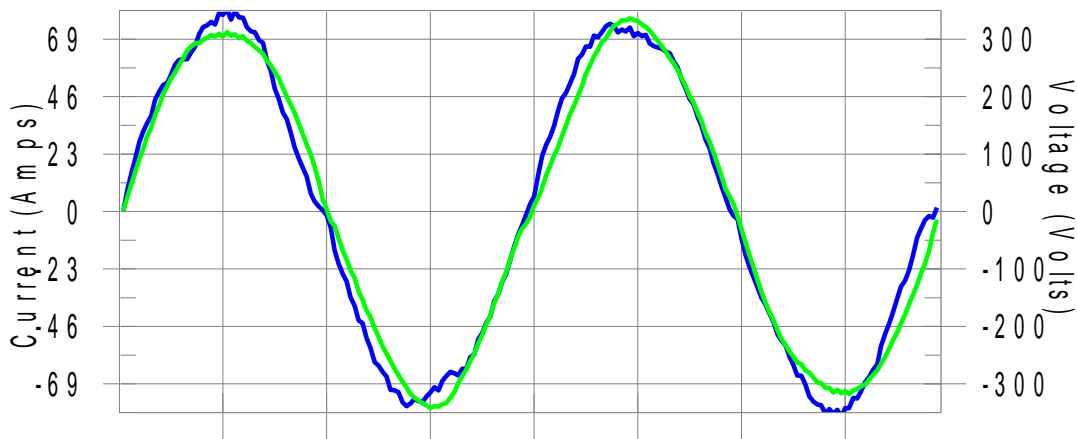
Measurement data	Port under test	AC input power-Line
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Harmonics – Per EN/IEC61000-3-12, Ed. 2.0(Phase C-Run time)

Test category: Table:2, Rsce=33, Test Margin: 100
 Test date: 2020/11/4 Start time: 10:19:35 End time: 10:22:18
 Test duration (min): 2.5 Data file name: WIN2106_H-000259.cts_data
 Comment: CHARGE MODE

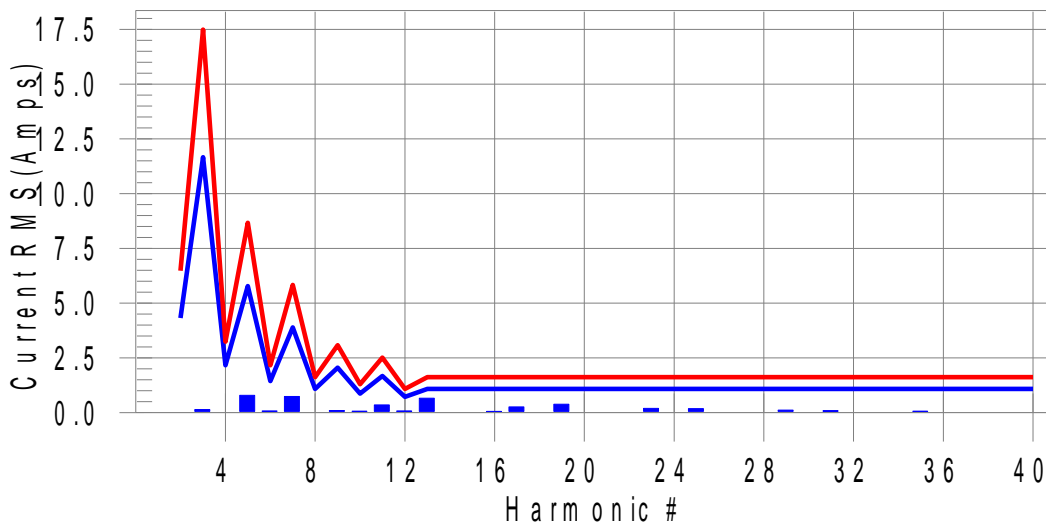
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 2 limit line

European Limits



Test result: Pass Worst harmonics H13-42.1% of 150% limit, H13-60.9% of 100% limit.

Measurement data		Port under test		AC input power-Line			
Current Test Result Summary (Phase C-Run time)							
Test category: Table:2, Rsce=33,		Test Margin: 100					
Test date: 2020/11/4		Start time: 10:19:35		End time: 10:22:18			
Test duration (min): 2.5		Data file name: WIN2106_H-000259.cts_data					
Comment: CHARGE MODE							
Test Result: Pass		Measured Iref: 53.981(Amps)		Source: Normal			
THC/Iref (%): 2.3		Limit (%): 23.0		PWHC/Iref (%): 0.0		PWHC Limit (%): 23.0	
Highest parameter values during test:							
V_RMS (Volts): 229.92		Frequency (Hz): 50.00					
I_Peak (Amps): 87.281		I_RMS (Amps): 54.307					
I_Fund (Amps): 53.889(avg)		Crest Factor: 1.607					
Power (Watts): 12416		Power Factor: 0.994					
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.049	4.319	1.1	0.545	6.478	8.4	Pass
3	0.139	11.660	1.2	0.200	17.490	1.1	Pass
4	0.034	2.159	1.6	0.570	3.239	17.6	Pass
5	0.785	5.776	13.6	0.808	8.664	9.3	Pass
6	0.069	1.440	4.8	0.115	2.159	5.3	Pass
7	0.732	3.887	18.8	0.926	5.830	15.9	Pass
8	0.040	1.080	3.7	0.273	1.619	16.9	Pass
9	0.092	2.051	4.5	0.113	3.077	3.7	Pass
10	0.058	0.864	6.7	0.197	1.296	15.2	Pass
11	0.348	1.673	20.8	0.376	2.510	15.0	Pass
12	0.073	0.720	10.1	0.087	1.080	8.0	Pass
13	0.657	1.080	60.9	0.682	1.619	42.1	Pass
14	0.023	N/A	N/A	0.033	N/A	N/A	N/A
15	0.034	N/A	N/A	0.052	N/A	N/A	N/A
16	0.054	N/A	N/A	0.092	N/A	N/A	N/A
17	0.262	N/A	N/A	0.295	N/A	N/A	N/A
18	0.049	N/A	N/A	0.061	N/A	N/A	N/A
19	0.381	N/A	N/A	0.404	N/A	N/A	N/A
20	0.039	N/A	N/A	0.058	N/A	N/A	N/A
21	0.036	N/A	N/A	0.048	N/A	N/A	N/A
22	0.041	N/A	N/A	0.051	N/A	N/A	N/A
23	0.190	N/A	N/A	0.214	N/A	N/A	N/A
24	0.041	N/A	N/A	0.099	N/A	N/A	N/A
25	0.181	N/A	N/A	0.208	N/A	N/A	N/A
26	0.031	N/A	N/A	0.047	N/A	N/A	N/A
27	0.042	N/A	N/A	0.051	N/A	N/A	N/A
28	0.018	N/A	N/A	0.028	N/A	N/A	N/A
29	0.113	N/A	N/A	0.126	N/A	N/A	N/A
30	0.017	N/A	N/A	0.026	N/A	N/A	N/A
31	0.087	N/A	N/A	0.099	N/A	N/A	N/A
32	0.014	N/A	N/A	0.018	N/A	N/A	N/A
33	0.030	N/A	N/A	0.037	N/A	N/A	N/A
34	0.012	N/A	N/A	0.020	N/A	N/A	N/A
35	0.062	N/A	N/A	0.082	N/A	N/A	N/A
36	0.020	N/A	N/A	0.027	N/A	N/A	N/A
37	0.039	N/A	N/A	0.050	N/A	N/A	N/A
38	0.024	N/A	N/A	0.031	N/A	N/A	N/A
39	0.021	N/A	N/A	0.030	N/A	N/A	N/A
40	0.029	N/A	N/A	0.034	N/A	N/A	N/A
Note: Measured I-ref was applied for this test.							

Measurement data	Port under test	AC input power-Line		
Voltage Source Verification Data (Phase C-Run time)				
Test category: Table:2, Rsce=33, Test Margin: 100 Test date: 2020/11/4 Start time: 10:19:35 End time: 10:22:18 Test duration (min): 2.5 Data file name: WIN2106_H-000259.cts_data Comment: CHARGE MODE				
Test Result: Pass Source qualification: Normal Measured source distortion is within the requirements of the standards Measurements are compliant with IEC/EN61000-3-12 Ed. 2.0 & IEC/EN61000-4-7 Ed. 2.1				
Highest parameter values during test:				
Voltage (Vrms): 229.92		Frequency (Hz): 50.00		
I_Peak (Amps): 87.281		I_RMS (Amps): 54.307		
I_Fund (Amps): 53.889(avg)		Crest Factor: 1.607		
Power (Watts): 12416		Power Factor: 0.994		
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.315	0.919	34.22	OK
3	0.302	2.873	10.52	OK
4	0.221	0.919	24.09	OK
5	0.142	3.447	4.11	OK
6	0.174	0.919	18.96	OK
7	0.338	2.873	11.75	OK
8	0.205	0.919	22.31	OK
9	0.237	1.379	17.20	OK
10	0.182	0.919	19.83	OK
11	0.146	1.609	9.10	OK
12	0.108	0.689	15.63	OK
13	0.366	1.379	26.54	OK
14	0.077	0.690	11.10	OK
15	0.168	0.690	24.34	OK
16	0.165	0.690	23.90	OK
17	0.188	0.689	27.32	OK
18	0.130	0.690	18.81	OK
19	0.292	0.690	42.34	OK
20	0.112	0.689	16.18	OK
21	0.113	0.690	16.39	OK
22	0.131	0.690	19.01	OK
23	0.199	0.690	28.81	OK
24	0.119	0.689	17.21	OK
25	0.240	0.690	34.77	OK
26	0.123	0.690	17.83	OK
27	0.097	0.690	14.08	OK
28	0.083	0.690	12.09	OK
29	0.160	0.690	23.16	OK
30	0.079	0.690	11.45	OK
31	0.143	0.689	20.79	OK
32	0.079	0.689	11.46	OK
33	0.092	0.690	13.36	OK
34	0.065	0.690	9.49	OK
35	0.130	0.690	18.91	OK
36	0.089	0.689	12.98	OK
37	0.101	0.689	14.64	OK
38	0.080	0.689	11.67	OK
39	0.097	0.690	14.05	OK
40	0.074	0.690	10.67	OK
5th Harmonic Phase Angle and Magnitude for Phase A: H-5_min_phase: 219.1 Degree (Leading) H-5_max_phase: 249.3 Degree (Leading) H-5_ave_phase: 246.5 Degree (Leading)				

Measurement data	Port under test	AC input power-Line
<p> H-5_ave_vector_magnitude: 0.952 Amp H-5_standard_ave_magnitude: 0.952 Amp H-5_standard_max_magnitude: 0.974 Amp Ratio of H-5_ave_vector / H-5_standard_ave: 1.000 </p> <p> Phase A = 45.033% of tested R_{sce} = 33.000, R_{sce} = 14.861 Phase B = 35.404% of tested R_{sce} = 33.000, R_{sce} = 11.683 Phase C = 60.874% of tested R_{sce} = 33.000, R_{sce} = 20.089 Minimum R_{sce} required: R_{sce} = 20.089 </p>		
Remark		

4.6 Voltage changes, voltage fluctuations and flicker	VERDICT: PASS
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Standard	IEC 61851-21-2
Basic standard	IEC 61000-3-3 & 11

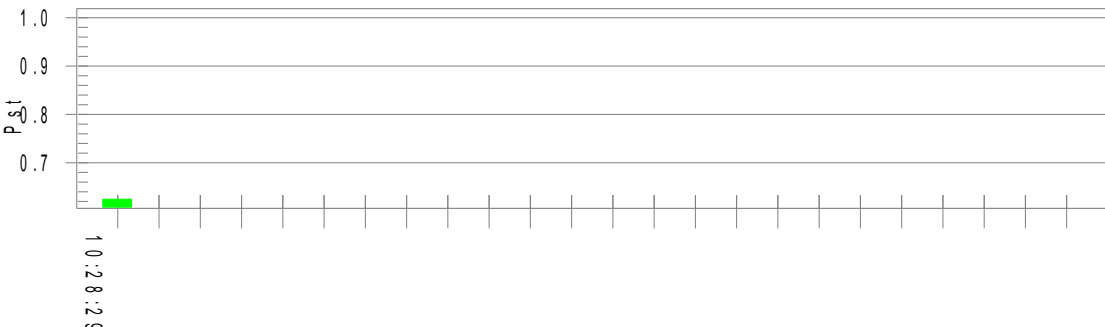
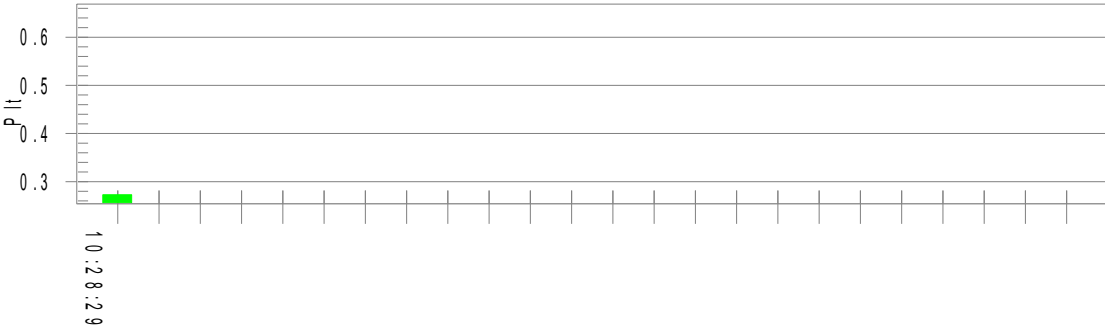
Limits

P _{ST} (Short term flicker)	<input checked="" type="checkbox"/>	≤ 1	<input type="checkbox"/>	Not Applicable
P _{LT} (Long term flicker)	<input checked="" type="checkbox"/>	≤ 0,65	<input type="checkbox"/>	Not Applicable
d _C (Relative Voltage change)	<input checked="" type="checkbox"/>	≤ 3,3%	<input type="checkbox"/>	Not Applicable
T _{max} (Maximum time duration)	<input checked="" type="checkbox"/>	≤ 500ms	<input type="checkbox"/>	Not Applicable
d _{MAX} (Max. voltage change)	<input checked="" type="checkbox"/>	≤ 4%	<input type="checkbox"/>	6%
	<input type="checkbox"/>	7%	<input type="checkbox"/>	Not Applicable
<u>Supplemental information:</u>				

Performed measurements

Reason for not performing the measurement(s)	<input type="checkbox"/>	Tests are not necessary because the EUT is unlikely to produce significant voltage fluctuations or flicker (clause 6.1).				
Port under test	AC Mains power input					
Voltage – Mains [V]	400 Vac					
Frequency – Mains [Hz]	50Hz					
Test method	<input checked="" type="checkbox"/>	Flickermeter according EN / IEC 61000-4-15:2011				
	<input type="checkbox"/>	Simulation (Clause 4.2.3 of EN / IEC 61000-3-3)				
	<input type="checkbox"/>	Analytical method (Clause 4.2.4 of EN / IEC 61000-3-3)				
	<input type="checkbox"/>	Use of P _{st} = 1 curve (Clause 4.2.5 of EN / IEC 61000-3-3)				
Observation period	<input checked="" type="checkbox"/>	10 min.	<input type="checkbox"/>	120 min.	<input type="checkbox"/>	Other:
	<input type="checkbox"/>	24 times switching according to Annex B				
Operating mode(s) used	Mode 3					
Remark	---					

See next page.

Measurement data	Port under test	AC input power-Line
Operating mode used during the test	Mode 3 / 400 Vac / 50 Hz	
Flicker Test Summary Per EN/IEC61000-3-11, Ed. 1.0(Phase A-Run time) per EN/IEC61000-3-11 IEC61000-3-11 Ed. 1.0 (2000)		
Test category: All parameters		Test Margin: 100
Test date: 2020/11/3	Start time: 10:18:06	End time: 10:28:35
Test duration (min): 10	Data file name: WIN2106_F-000257.cts_data	
Comment: CHARGE MODE		
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)		
Test Result: Pass		
Status: Test Completed		
Pst_i and limit line		
		
Plt and limit line		
		
Parameter values recorded during the test:		
Vrms at the end of test (Volt): 229.44		
T-max (mS):	0.0	Test limit (mS): 500.0 Pass
Highest dc (%):	0.00	Test limit (%): 3.30 Pass
Highest dmax (%):	-0.82	Test limit (%): 4.00 Pass
Highest Pst (10 min. period):	0.625	Test limit: 1.000 Pass
Highest Plt (2 hr. period):	0.273	Test limit: 0.650 Pass
Calculated dmax(%): 1.100		
Calculated dc(%): 0.000		
Calculated Pst : 0.834		
Calculated Plt : 0.364		
The maximum permissible system impedance Zsys:		
Z-phase A = 0.315 Ohm + j 0.197 Ohm	(0.315 Ohm + 627 ?H)	
Z-neutral A = 0.210 Ohm + j 0.131 Ohm	(0.210 Ohm + 418 ?H)	

Measurement data	Port under test	AC input power-Line
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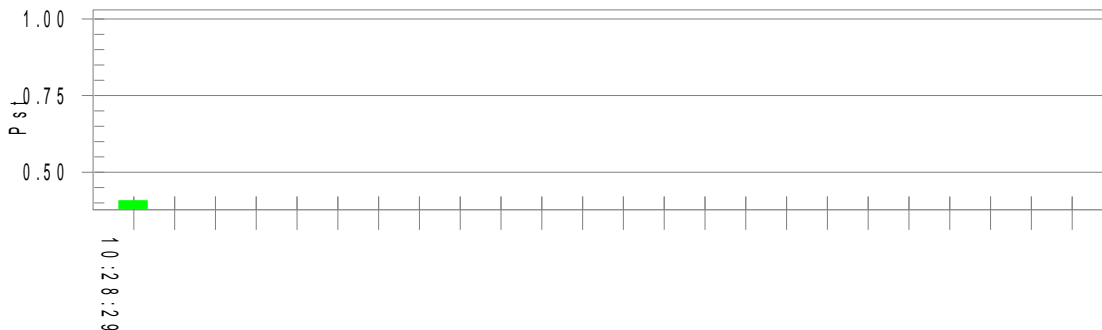
Flicker Test Summary Per EN/IEC61000-3-11, Ed. 1.0(Phase B-Run time) per EN/IEC61000-3-11

Test category: All parameters **Test Margin:** 100
Test date: 2020/11/3 **Start time:** 10:18:06 **End time:** 10:28:35
Test duration (min): 10 **Data file name:** WIN2106_F-000257.cts_data
Comment: CHARGE MODE

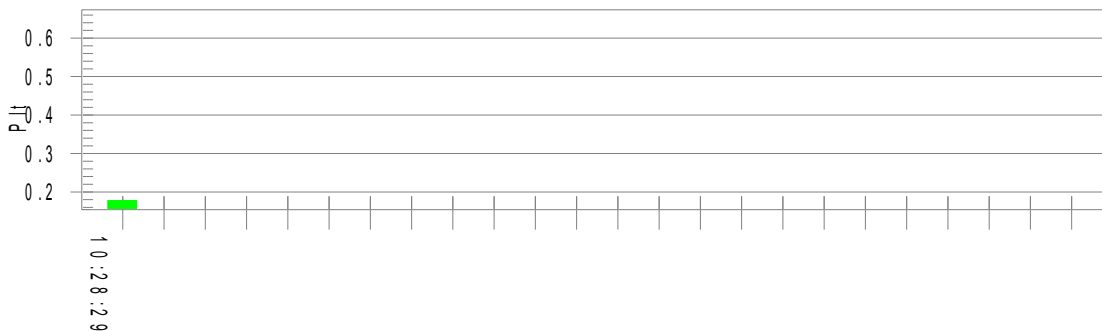
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)

Test Result: Pass
Status: Test Completed

Pst_i and limit line



Plt and limit line



Parameter values recorded during the test:

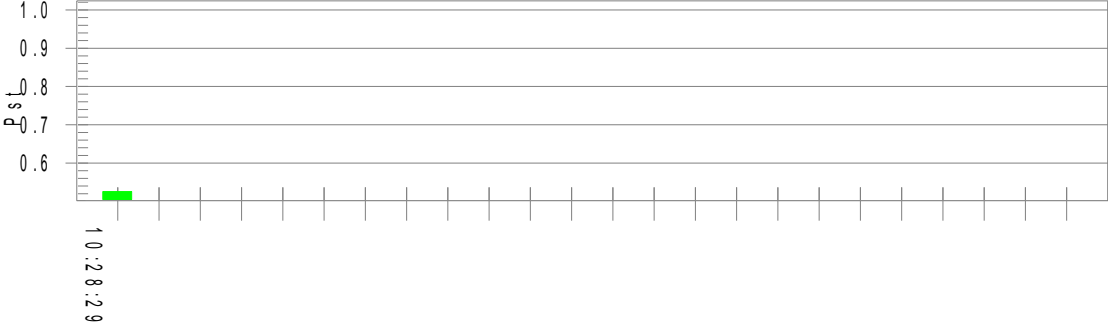
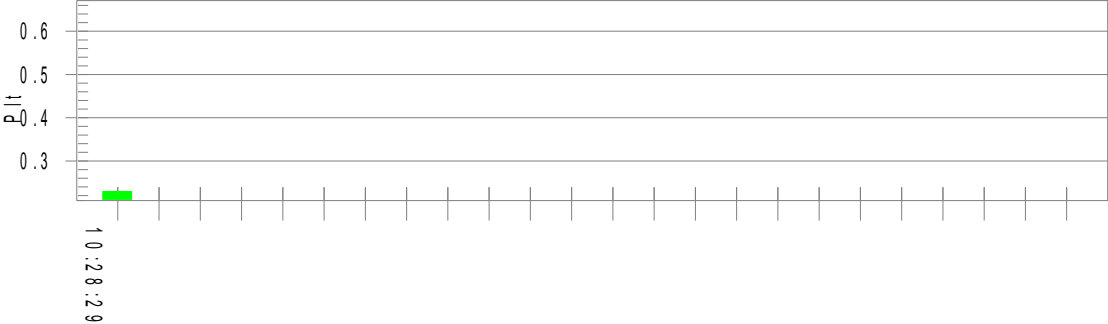
Vrms at the end of test (Volt): 230.61

Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.49	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.407	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.178	Test limit:	0.650	Pass

Calculated dmax(%): 0.650
Calculated dc(%): 0.000
Calculated Pst : 0.543
Calculated Plt : 0.237

The maximum permissible system impedance Zsys :

Z-phase B = 0.599 Ohm + j 0.375 Ohm (0.599 Ohm + 1193 ?H)
Z-neutral B = 0.400 Ohm + j 0.250 Ohm (0.400 Ohm + 795 ?H)

Measurement data	Port under test	AC input power-Line
Flicker Test Summary Per EN/IEC61000-3-11, Ed. 1.0(Phase C-Run time) per EN/IEC61000-3-11		
Test category: All parameters Test date: 2020/11/3 Test duration (min): 10 Comment: CHARGE MODE		Test Margin: 100 Start time: 10:18:06 End time: 10:28:35 Data file name: WIN2106_F-000257.cts_data
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)		
Test Result: Pass Status: Test Completed		
Pst_i and limit line		
		
Plt and limit line		
		
Parameter values recorded during the test:		
Vrms at the end of test (Volt): 230.45		
Time(mS) > dt: Highest dc (%): Highest dmax (%): Highest Pst (10 min. period): Highest Plt (2 hr. period):	0.0 0.00 -0.46 0.526 0.230	Test limit (mS): 500.0 Test limit (%): 3.30 Test limit (%): 4.00 Test limit: 1.000 Test limit: 0.650 Pass Pass Pass Pass Pass
Calculated dmax(%): 0.609 Calculated dc(%): 0.000 Calculated Pst : 0.701 Calculated Plt : 0.306		
The maximum permissible system impedance Zsys :		
Z-phase C = 0.408 Ohm + j 0.255 Ohm (0.408 Ohm + 813 ?H) Z-neutral C = 0.272 Ohm + j 0.170 Ohm (0.272 Ohm + 542 ?H)		
Remark		

5 IMMUNITY TEST RESULTS

5.1 Performance (Compliance) criteria

[Source: IEC 61851-21-2]

Performance criterion A: The EUT shall continue to operate as intended within the tolerances defined by the EUT manufacturer during and after the application of the appropriate tests. It shall not change the state in which it is operating (i.e. charging shall continue if in charge mode and shall remain idle if in waiting mode).

Performance criterion B: The EUT shall continue to operate as intended within the tolerances defined by the EUT manufacturer at the completion of the applicable tests. Additionally, during the application of the appropriate tests the primary functions of the charger shall be maintained (within the tolerances defined by the EUT manufacturer). Secondary functions (for example displays, etc.) may degrade in performance during the test but shall resume to the original condition subsequent to testing. Subsequent to the application of the applicable test, the EUT shall not have changed the state in which it is operating (i.e. charging shall continue if in charge mode and shall remain idle if in waiting mode).

Performance criterion C: During and after completion of the appropriate tests, the EUT can change to a failsafe condition. This state requires user intervention to restart the charge cycle or the automatic resumption of charging if the safety conditions have been fulfilled as defined in IEC 61851-1:2017 (simplified mode 3).

5.1.1 Performance criteria related to immunity tests

Immunity test	Performance criteria
Electrostatic discharge	B
Radio-frequency electromagnetic fields	A
Fast transients	B
Surge transient	B
Injected currents (radio-frequency common mode)	A
Power frequency magnetic field immunity	A
Voltage dips and short interruptions	B, C

5.1.2 Manufacturer defined performance criteria

Not provided.

5.2 Monitored – Checked Functions / Parameters

During the immunity tests the following functions of the EUT has/have been monitored/checked.

<input type="checkbox"/>	Motor speed	<input type="checkbox"/>	Display data
<input type="checkbox"/>	Switching	<input type="checkbox"/>	Data storage
<input type="checkbox"/>	Standby mode	<input type="checkbox"/>	Sensor functions
<input type="checkbox"/>	Temperature	<input type="checkbox"/>	Audible signals
<input type="checkbox"/>	Power consumption	<input checked="" type="checkbox"/>	Others : Screen
<input type="checkbox"/>	AC mains input current	<input checked="" type="checkbox"/>	Others : Output voltage
<input type="checkbox"/>	Timing	<input checked="" type="checkbox"/>	Others : Input current
<input type="checkbox"/>	Illumination	<input type="checkbox"/>	Others :
<u>Supplementary information :</u>			

Immunity test	Monitored - Checked function(s)/parameter(s) during / after the test	Method
Electrostatic discharge	PASS	Visual
Radio-frequency electromagnetic fields	PASS	Visua
Fast transients	PASS	Visual
Surge transient	PASS	Visual
Injected currents (radio-frequency common mode)	PASS	Visual
Power frequency magnetic field immunity	PASS	Visual
Voltage dips and short interruptions	PASS	Visual
<u>Supplementary information :</u>		

5.3 Electrostatic discharge immunity	VERDICT: PASS
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Electrostatic discharges (ESD) are the result of persons or objects that accumulate static electricity due to for instance walking on synthetic carpets. The ESD can influence the operation of equipment or damage its electronics, either by a direct discharge or indirectly by coupling or radiation. Both effects are simulated during the tests.

Requirements

Standard	IEC 61851-21-2						
Basic standard	IEC 61000-4-2						
Port under test	Enclosure						
Air discharges	<input checked="" type="checkbox"/>	±2 kV	<input checked="" type="checkbox"/>	±4 kV	<input checked="" type="checkbox"/>	±8 kV	<input type="checkbox"/> kV
Contact discharges	<input type="checkbox"/>	±2 kV	<input checked="" type="checkbox"/>	±4 kV	<input type="checkbox"/>	±8 kV	<input type="checkbox"/> kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval.						
Performance criterion	B; During the test degradation is allowed. No change of operating state or stored data is allowed. Refer to the chapter 5.1 for details.						

Performed tests

Set-up	<input checked="" type="checkbox"/>	Table-top	<input type="checkbox"/>	Floor standing
Ambient temperature [°C]	23.8		Relative Humidity air [%]	48
Voltage – Mains [V]	400 Vac			
Frequency – Mains [Hz]	50Hz			
Operating mode(s) used	Mode 1, Mode 2			

Test Location	Test Voltage [kV] & Polarity	Coupling type	# of applied discharges / polarity	Discharge interval [s]
<input checked="" type="checkbox"/> Slot/Screen/Button/LED	±2, ±4, ±8	Air	10	1
<input checked="" type="checkbox"/> Metal/Screw	±4	Contact	10	1
<input checked="" type="checkbox"/> HCP top side.	±4	Contact	10	1
<input checked="" type="checkbox"/> HCP bottom side.	±4	Contact	10	1
<input checked="" type="checkbox"/> VCP right side.	±4	Contact	10	1
<input checked="" type="checkbox"/> VCP left side.	±4	Contact	10	1
<input checked="" type="checkbox"/> VCP front side.	±4	Contact	10	1
<input checked="" type="checkbox"/> VCP rear side.	±4	Contact	10	1

Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.
Supplementary information:	

5.4 Radio-frequency electromagnetic fields immunity

VERDICT: PASS

During the test it is verified if the equipment under test (EUT) has sufficient immunity against radiated electromagnetic fields. Industrial electromagnetic sources, walkie-talkies, radio transmitters, television transmitters and telecommunication equipment including cellular telephones and other emitting devices can generate these fields.

Requirements

Standard	IEC 61851-21-2			
Basic standard	IEC 61000-4-3			
Port under test	Enclosure			
AC&DC charging immunity requirements – Environments other than residential				
Frequency range	Test level	Modulation	Dwell time	Step size
80 – 1000 MHz	10 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
1400 – 2000 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
2000 – 2700 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
AC&DC charging immunity requirements – Residential environments				
80 – 1000 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
1400 – 2000 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
2000 – 2700 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
<u>Supplementary information:</u>				

Performed tests

Test method	<input checked="" type="checkbox"/>	EN 61000-4-3	<input type="checkbox"/>	EN 61000-4-20		
Test set-up	<input checked="" type="checkbox"/>	Equipment on the table (0,8 m height)				
(see annex 3 for photo)	<input type="checkbox"/>	Equipment standing on floor (0,05 – 0,15 m height)				
Voltage – Mains [V]	400 Vac		Frequency – Mains [Hz]	50 Hz		
Operating mode(s) used	Mode 1, Mode 2					
Frequency range (applied)	Antenna Polarization	Test level (applied)	Modulation (applied)	Dwell time (applied)	Test Criteria	
80 – 1000 MHz (step size 1%)	H	10V/m	80% AM (1kHz)	1 s	A	
	V	10V/m	80% AM (1kHz)	1 s	A	
1400 – 2000 MHz (step size 1%)	H	3 V/m	80% AM (1kHz)	1 s	A	
	V	3 V/m	80% AM (1kHz)	1 s	A	
2000 – 2700 MHz (step size 1%)	H	3 V/m	80% AM (1kHz)	1 s	A	
	V	3 V/m	80% AM (1kHz)	1 s	A	
Exposed side of the EUT	<input checked="" type="checkbox"/>	Front (0°)	<input checked="" type="checkbox"/>	Right (90°)	<input type="checkbox"/>	Top
	<input checked="" type="checkbox"/>	Rear (180°)	<input checked="" type="checkbox"/>	Left (270°)	<input type="checkbox"/>	Bottom
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.					
<u>Supplementary information:</u>						

5.5 Electrical Fast Transients immunity	VERDICT: PASS
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The EFT immunity test simulates disturbances by bursts of very short transients caused for example by switching off loads such as an AC motor or bouncing relay contacts. The transients are likely to disturb electronics but less likely to cause damage.

Requirements

Standard	IEC 61851-21-2		
Basic standard	IEC 61000-4-4		
Pulse characteristics	5/50 ns		
AC charging immunity requirements - Environments other than residential			
Port under test	Test level	Repetition frequency	Duration
Power input (AC)	± 4000 V	5 KHz	≥1 min. / polarity
Wired network and signal/ control	± 2000 V	5 KHz	≥1 min. / polarity
CPT	± 2000 V	5 KHz	≥1 min. / polarity
AC charging immunity requirements - Residential environments			
Power input (AC)	± 1000 V & ± 2000 V	5 KHz	≥1 min. / polarity
Wired network and signal/ control	± 500 V & ± 2000 V	5 KHz	≥1 min. / polarity
CPT	± 2000 V	5 KHz	≥1 min. / polarity
DC charging immunity requirements - Environments other than residential			
Power input (AC)	± 4000 V	5 KHz	≥1 min. / polarity
Power input (DC)	± 2000 V	5 KHz	≥1 min. / polarity
Wired network and signal/ control	± 2000 V	5 KHz	≥1 min. / polarity
CPT	± 2000 V	5 KHz	≥1 min. / polarity
DC charging immunity requirements - Residential environments			
Power input (AC)	± 2000 V	5 KHz	≥1 min. / polarity
Power input (DC)	± 2000 V	5 KHz	≥1 min. / polarity
Wired network and signal/ control	± 2000 V	5 KHz	≥1 min. / polarity
CPT	± 2000 V	5 KHz	≥1 min. / polarity
<p>¹⁾ Only applicable to ports interfacing with cables whose total length may exceed 3 m.</p> <p>²⁾ Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC-DC power adaptor shall be tested on the AC power input of the AC- DC power adaptor specified by the manufacturer or, where none is so specified, using a typical AC-DC power adaptor. The test is applicable to DC power input ports intended to be connected permanently to cables longer than 3 m.</p>			

Performed tests

Voltage – Mains [V]	400 Vac		
Frequency – Mains [Hz]	50 Hz		
Operating mode(s) used	Mode 1, Mode 2		
Test Set-up (see annex 3 for photo)	<input type="checkbox"/>	Equipment standing on floor at (0,1 ± 0,01) m above ground plane	
	<input checked="" type="checkbox"/>	Equipment on the table (0,1 ± 0,01) m above ground plane	
	<input type="checkbox"/>	Artificial hand applied. Location refer to chapter 9.	
Coupling	<input checked="" type="checkbox"/>	Common mode	<input type="checkbox"/> Other:

Port under test	Test Voltage &Polarity	Repetition Frequency	Test duration / polarity	Injection method			
				<input checked="" type="checkbox"/>	CDN	<input type="checkbox"/>	Clamp
Power input (AC)	±4KV	5 KHz	120 s	<input checked="" type="checkbox"/>	CDN	<input type="checkbox"/>	Clamp
CPT	±2KV	5 KHz	120 s	<input type="checkbox"/>	CDN	<input checked="" type="checkbox"/>	Clamp
Signal	±2KV	5 KHz	120 s	<input type="checkbox"/>	CDN	<input checked="" type="checkbox"/>	Clamp
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.						
<u>Supplementary information:</u>							

5.6 Surge transient immunity	VERDICT: PASS
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The surge transient immunity test simulates the surges that are caused by over-voltages due to indirect (induced) lightning transients. The pulse is a slow transient with high-energy contents and due to its long duration may cause damage to an unprotected EUT.

Requirements

Standard	IEC 61851-21-2		
Basic standard	IEC 61000-4-5		
Pulse characteristics	1,2/50µs Voltage; 8/20µs Current		
Repetition rate	≤ 60 secs. (for each test level and phase angle)		
Number of pulses	5 pulses (at each polarity and phase angle)		
AC charging immunity requirements - Environments other than residential			
Port	Test level & Polarity & Coupling		Phase angle [°]
	Line to Line ¹⁾	Line to Earth ¹⁾	
Power input (AC)	± 2 kV	± 4 kV	0, 90, 180, 270
Wired network and signal/ control	N/A	± 1 kV	---
CPT	± 1 kV	± 2 kV	0, 90, 180, 270
AC charging immunity requirements – Residential environments			
Power input (AC)	±1 kV	± 2 kV	0, 90, 180, 270
Wired network and signal/ control	N/A	± 1 kV	---
CPT	± 1 kV	± 2 kV	0, 90, 180, 270
DC charging immunity requirements - Environments other than residential			
Power input (AC)	± 2 kV	± 4 kV	0, 90, 180, 270
Power input (DC)	± 1 kV	± 2 kV	---
Wired network and signal/ control	N/A	± 1 kV	---
CPT	± 1 kV	± 2 kV	---
DC charging immunity requirements - Residential environments			
Power input (AC)	± 1 kV	± 2 kV	0, 90, 180, 270
Power input (DC)	± 1 kV	± 2 kV	---
Wired network and signal/ control	N/A	± 1 kV	---
CPT	± 1 kV	± 2 kV	---
¹⁾ In addition to the specified test level, all lower test levels as detailed in IEC 61000-4-5 should also be satisfied.			
²⁾ Only in case of long distance lines, > 30 m.			

Performed tests

Voltage – Mains [V]	400 Vac
Frequency – Mains [Hz]	50 Hz
Operating mode(s) used	Mode 1, Mode 2
Repetition rate	60 secs. (for each test level and phase angle)
Number of pulses	5 pulses (at each polarity and phase angle)

See next page

Port under test		Coupling	Test level & Polarity	Phase angle [°]	Test Criteria
<input checked="" type="checkbox"/>	Power input (AC)	L1+L2, L1+L3, L2+L3,	±2 kV	0, 90, 180, 270	A
<input checked="" type="checkbox"/>	Power input (AC)	L1/L2/L3+PE	±4 kV	0, 90, 180, 270	A
<input checked="" type="checkbox"/>	Signal	Tx+Rx	±1 kV	----	A
<input checked="" type="checkbox"/>	Signal	Tx/Rx+PE	±1 kV	----	A
Observation(s)		During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.			
<u>Supplementary information:</u>					

5.7	Injected currents (RF common mode) immunity	VERDICT: PASS
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During this test the immunity of the equipment for induced or conducted electromagnetic fields is checked. Fields generated by radio and other transmitters cause RF voltages in long cables like the mains network. This test reproduces these induced disturbing voltages by injecting them to the EUT via the cabling.

Requirements

Standard	IEC 61851-21-2			
Basic standard	IEC 61000-4-6			
Frequency range	0,15 – 80 MHz			
AC charging immunity requirements - Environments other than residential				
Port under test	Test level, U_0	Modulation	Step size	Dwell time
Power input (AC)	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
Wired network and signal/ control	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
CPT	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
AC charging immunity requirements - Residential environments				
Power input (AC)	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
Wired network and signal/ control	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
CPT	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
DC charging immunity requirements - Environments other than residential				
Power input (AC)	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
Power input (DC)	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
Wired network and signal/ control	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
CPT	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
DC charging immunity requirements - Residential environments				
Power input (AC)	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
Power input (DC)	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
Wired network and signal/ control	3 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
CPT	10 V	80% AM (1kHz)	≤ 1%	≥ 0,5 s
¹⁾ Only applicable to ports interfacing with cables whose total length, may exceed 3 m. ²⁾ DC connections between parts of equipment/system which are not connected to a DC distribution network are treated as I/O signal/control ports.				

See next page

Performed tests

Test method (applied)	Frequency range (applied)	Modulation (applied)	Step size (applied)	
EN 61000-4-6	0,15 – 80 MHz	80% AM (1kHz)	1%	
Voltage – Mains [V]	400 Vac	Frequency – Mains [Hz]	50 Hz	
Operating mode(s) used	Mode 1, Mode 2			
Test set-up (see annex 3 for photo)	<input type="checkbox"/>	Equipment standing on floor at (0,1 ± 0,01) m above ground plane.		
	<input checked="" type="checkbox"/>	Equipment on the table (0,1 ± 0,01) m above ground plane.		
	<input type="checkbox"/>	Artificial hand applied. Location refer to Annex 3.		
Port under test	Test Level (applied)	Injection method	Dwell time (applied)	Test Criteria
AC input power	10 V	CDN	3 s	A
CPT	10 V	Clamp	3 s	A
Signal	10 V	Clamp	3 s	A
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.			
<u>Supplementary information:</u>				

5.8 Power frequency magnetic field immunity	VERDICT: PASS
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Magnetic fields caused by for example nearby mains frequency transformers may disturb equipment with sensitivity for these type of disturbances such as CRT monitors.

Requirements

Standard	IEC 61851-21-2
Basic standard	IEC 61000-4-8
Port under test	Enclosure
Field strength	3 A/m, 30 A/m ¹⁾ , 100 A/m ²⁾
Test Frequency	50 / 60 Hz
Notes: Applicable only to apparatus containing devices susceptible to magnetic fields.	
1) Apply for systems ≤ 32 A;	
2) Apply for systems > 32 A	

Performed tests

Reason for not performing the test	<input type="checkbox"/>	The test is not applicable as the apparatus does not contain any components susceptible to this low-frequency magnetic fields.
Voltage – Mains [V]	400 Vac	
Frequency – Mains [Hz]	50 Hz	
Operating mode(s) used	Mode 1, Mode 2	
Test set-up (see annex 3 for photo)	<input checked="" type="checkbox"/>	Single Coil. Dimensions: 1 m x 1 m
	<input type="checkbox"/>	Single Coil. Dimensions: 2 m x 2 m
	<input type="checkbox"/>	Homogeneous field (Helmholtz coil). Dimensions: 1 m x 1 m
	<input type="checkbox"/>	0,1 m above metal surface

Axis under test	Tested Field strength	Test Frequency	Test Duration	Test Criteria
<input checked="" type="checkbox"/> X-axis	100 A/m	50 Hz	5 mins	A
<input checked="" type="checkbox"/> Y-axis	100 A/m	50 Hz	5 mins	A
<input checked="" type="checkbox"/> Z-axis	100 A/m	50 Hz	5 mins	A
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.			
Supplementary information:				

5.9	Power supply interruptions and dips immunity	VERDICT: PASS
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The purpose of the test is to verify the immunity of the equipment against voltage dips and voltage interruptions. It helps to ensure that the equipment functions properly (as expected and safely) with power supply fluctuations. Voltage dips and interruptions are caused by faults in the LV, MV, HV networks (short-circuit or ground faults).

Requirements

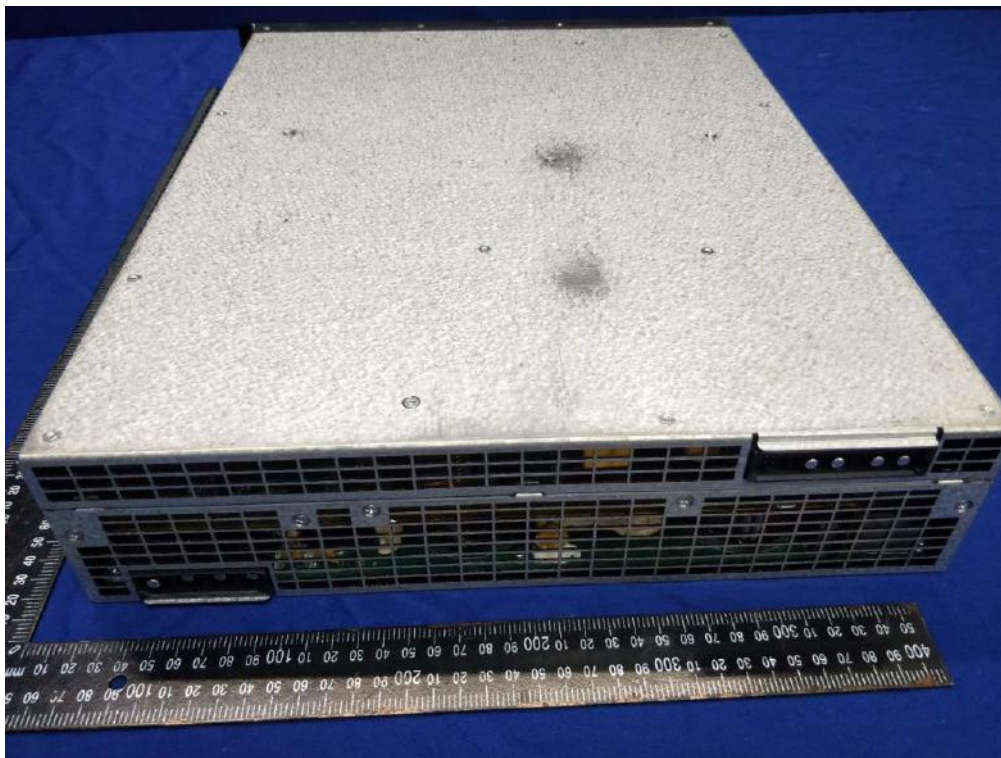
Standard	IEC 61851-21-2			
Basic standard	IEC 61000-4-11 (≤ 16 A) IEC 61000-4-34 (> 16 A)			
# of dips & interruptions	3 dips / interruptions for each test level and phase angle			
Interval between events	≥ 10 seconds			
Port under test	Test level	Period (Cycles)		Performance Criterion
		50 Hz	60 Hz	
Power input (AC)	40%	10	12	B; Refer to the chapter 5.1 for details.
	70%	25	30	B; Refer to the chapter 5.1 for details.
	0%	1	1	B; Refer to the chapter 5.1 for details.
	0%	250	300	C; Refer to the chapter 5.1 for details.
NOTE: Where the equipment has a rated voltage range the following shall apply:				
<ul style="list-style-type: none"> - If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range. A single voltage within that range may be selected for testing. - In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range. 				

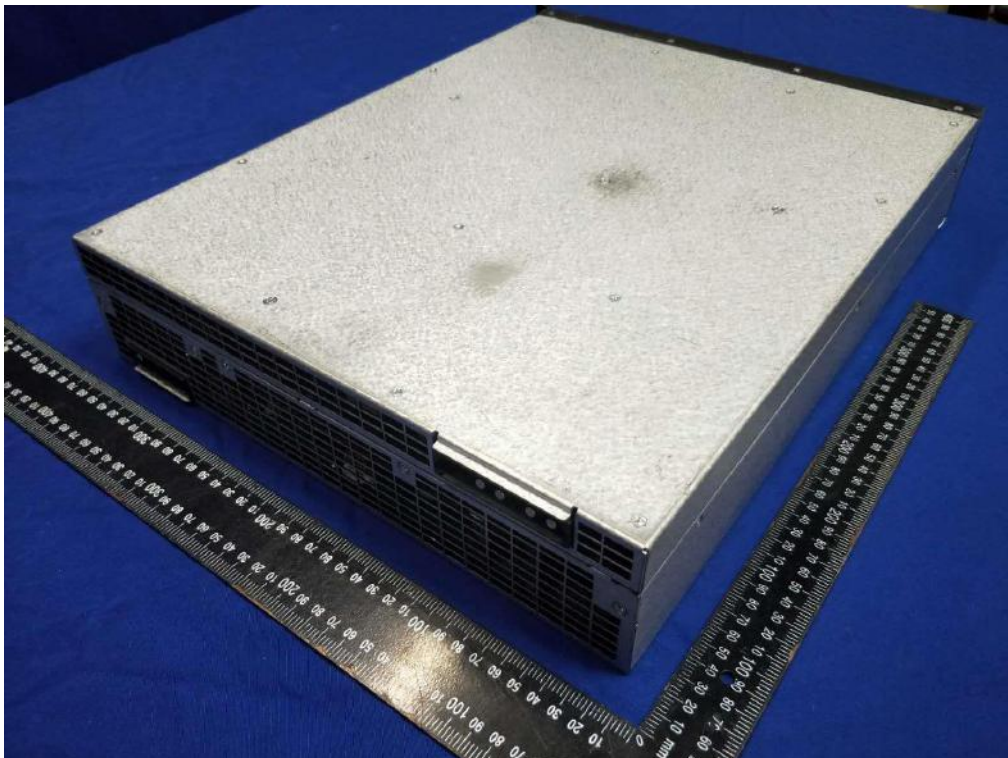
Performed tests

U _{NOM} [V _{AC}]	Terminal	Test level [% U _{NOM}]	Duration [cycles]	Repetition rate [s]	Number of dips per test	Phase angle [°]	Test Criteria
			50 Hz				
230	L-N	40	10	10	3	0,45,90,135,180, 225,270,315	A Note 1
230	L-N	70	25	10	3	0,45,90,135,180, 225,270,315	A Note 1
230	L-N	0	1	10	3	0,45,90,135,180, 225,270,315	A Note 1
230	L-N	0	250	10	3	0,45,90,135,180, 225,270,315	C Note 2
Operating mode(s) used		Mode 1, Mode 2					
Observation(s)		Note 1: During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed. Note 2: Dips to 0%, Duration 250 cycles, EUT stopped operation, but it can be resumed by user.					
Supplementary information:							

6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

The photographs show the tested device.





7 ANNEX 1 - MEASUREMENT UNCERTAINTIES

The table(s) below show(s) measurement uncertainties of the EMC test set-ups. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Test Item	Uncertainty
Conducted Emission	3.16dB (9k~150kHz Conduction 2#)
	2.90dB (150k-30MHz Conduction 2#)
Radiated Emission Uncertainty(3m 3# Chamber)	4.40dB (30M~1GHz Polarize: H)
	5.04dB (30M~1GHz Polarize: V)
	4.94dB (1~6GHz)
Flicker test	0.07%
Harmonic test	1.8%
C/S Test	1.45 (Using CDN Test)
	2.37 (Using EM Clamp Test)
R/S Test	2.10dB (80MHz-200MHz)
	1.76dB (200MHz-1000MHz)
Emperature and humidity	0.6°C
	4%

8 ANNEX 2 – USED EQUIPMENT

Location: EMTEK (SHENZHEN) CO., LTD.

For Power Line Conducted Emission Measurement

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	101045	May 17, 2020	1Year
PULSE LIMTER	Rohde & Schwarz	ESH3-Z2	100107	May 16, 2020	1Year
AMN	Schwarzbeck	NNLK 8129	8129203	May 16, 2020	1Year

For Radiated Emission Measurement

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	May 17, 2020	1Year
Pre-Amplifie	Lunar EM	LNA10M1G-40	J1011130912001	May 17, 2020	1Year
Bilog Antenna	Schwarzbeck	VULB9163	659	Nov 10, 2018	2 Year
EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	May 17, 2020	1Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1177	June 12, 2018	2 Year
Pre-Amplifie	SKET	LNPA_0118G-45	SK2019051801	May 17, 2020	1Year
Receiver	Rohde & Schwarz	ESR7(10HZ-7GHZ)	N/A	May 16, 2020	1 Year
Magnetic Field Antenna	Schwarzbeck	FESP 5133-7/41	282	July 04, 2020	2 Year

For Harmonic Current / Flicker Measurement

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 17, 2020	1 Year
Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 17, 2020	1 Year
Impedance network	Teseq	INA2197/37A	1305A02873	May 17, 2020	1 Year
Impedance network	Teseq	INA 2196/75A	1305A02874	May 17, 2020	1 Year
Proflin 2100 AC Switching Unit	Teseq	NSG 2200-3	A22714	May 17, 2020	1 Year

For Electrostatic Discharge Immunity Test

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
ESD Tester	TESEQ AG	NSG 438A	130	May 17, 2020	1 Year

For RF Strength Susceptibility Test

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
Power Amplifier	MILMEGA	AS0102-55	1018770	May 17, 2020	1 Year
50ohm Diode Power Sensor	BOONTON	51011EMC	34236	May 17, 2020	1 Year
RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 17, 2020	1 Year
Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	811	N/A	N/A
Signal Generator	Agilent	N5181A	MY50145187	May 17, 2020	1 Year
50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 17, 2020	1 Year
Broad-Band Horn Antenna	SCHWARZBECK	STLP 9149	9149-227	N/A	N/A
Field Strength Meter	DARE	RSS1006A	10I00037SNO22	May 17, 2020	1 Year
Multi-function interface system	DARE	CTR1009B	12I00250SNO72	N/A	N/A
Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A
Power Amplifier	MILMEGA	AS1860-50	1059346	May 17, 2020	1 Year
Power Amplifier	MILMEGA	80RF1000-175	1059345	May 17, 2020	1 Year

For Electrical Fast Transient / Burst Immunity Test

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
Burst Tester	HAEFELY	PEFT4010	080981-16	May 16, 2020	1Year
Coupling Clamp	HAEFELY	IP-4A	147147	May 16, 2020	1Year
Three phase CDN	Teseq	CDN 163	202	May 16, 2020	1 Year

For Surge Immunity Test

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
Controller	HAEFELY	Psurge 8000	174031	May 16, 2020	1Year
Impulse Module	HAEFELY	PIM 100	174124	May 16, 2020	1Year
Coupling Decoupling	HAEFELY	PCD 130	172181	May 16, 2020	1Year
Coupling Module	HAEFELY	PCD122	174354	May 16, 2020	1Year
Impulse Module	HAEFELY	PIM 120	174435	May 16, 2020	1Year
Coupling Module	HAEFELY	PCD 126A	174387	May 16, 2020	1Year
Impulse Module	HAEFELY	PIM 110	174391	May 16, 2020	1Year

For Injected Current Susceptibility Test

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
Continuous Wave Simulator	EMTEST	CWS500C	0900-12	May 17, 2020	1Year
CDN	EMTEST	CDN-M2	510010010010	May 16, 2020	1Year
CDN	EMTEST	CDN-M3	0900-11	May 16, 2020	1Year
EM Injection Clamp	EMTEST	F-2031-23MM	368	May 16, 2020	1Year
Attenuator	EMTEST	100W 6dB DC-3G	/	May 16, 2020	1Year
Signal Generator	R&S	SMB100A	103041	May 17, 2020	1Year
Power meter	AGILENT	E4418B	MY45102886	May 17, 2020	1 Year
Three phase CDN	TESEQ	CDN M532S	33799	May 16, 2020	1 Year

For Magnetic Field Immunity Test

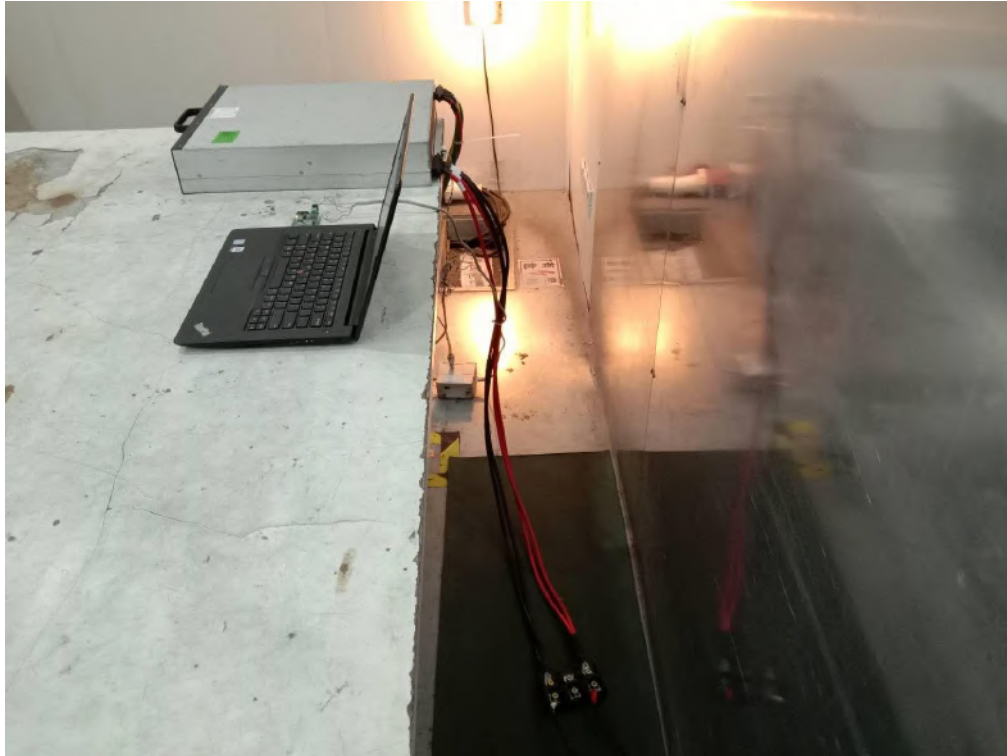
Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 17, 2020	1Year

For Voltage Dips and Interruptions Test

Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal. Interval
45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 17, 2020	1 Year
Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 17, 2020	1 Year
Impedance network	Teseq	INA2197/37A	1305A02873	May 17, 2020	1 Year
Impedance network	Teseq	INA 2196/75A	1305A02874	May 17, 2020	1 Year
Proflin 2100 AC Switching Unit	Teseq	NSG 2200-3	A22714	May 17, 2020	1 Year

9 ANNEX 3 - TEST PHOTOS

Conducted disturbance voltage at AC main input port



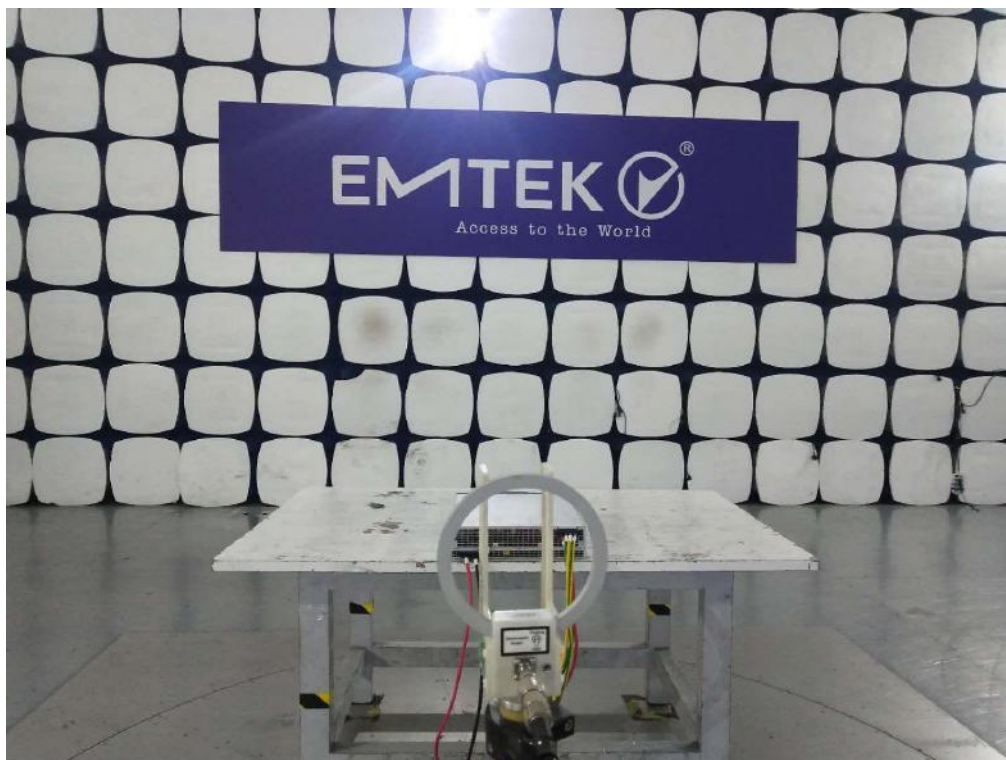
Conducted disturbance voltage at DC output port



Conducted disturbance voltage at Signal port



Radiated electromagnetic disturbances (2 KHz to 185 KHz)



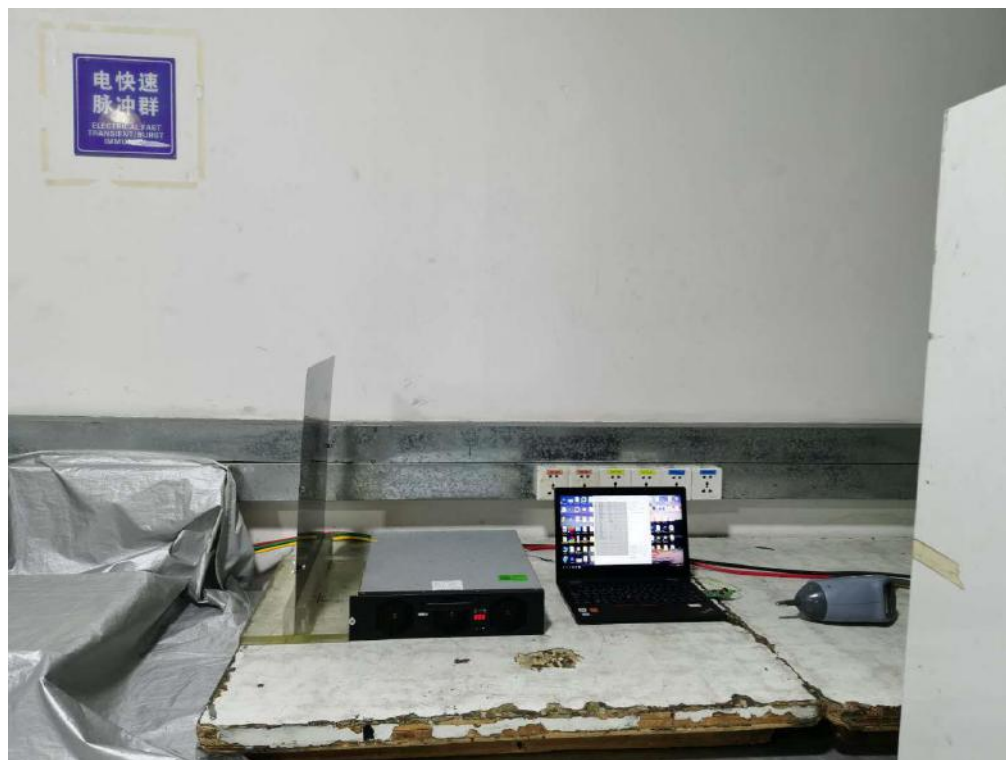
Radiated electromagnetic disturbances (30 MHz to 1000 MHz)



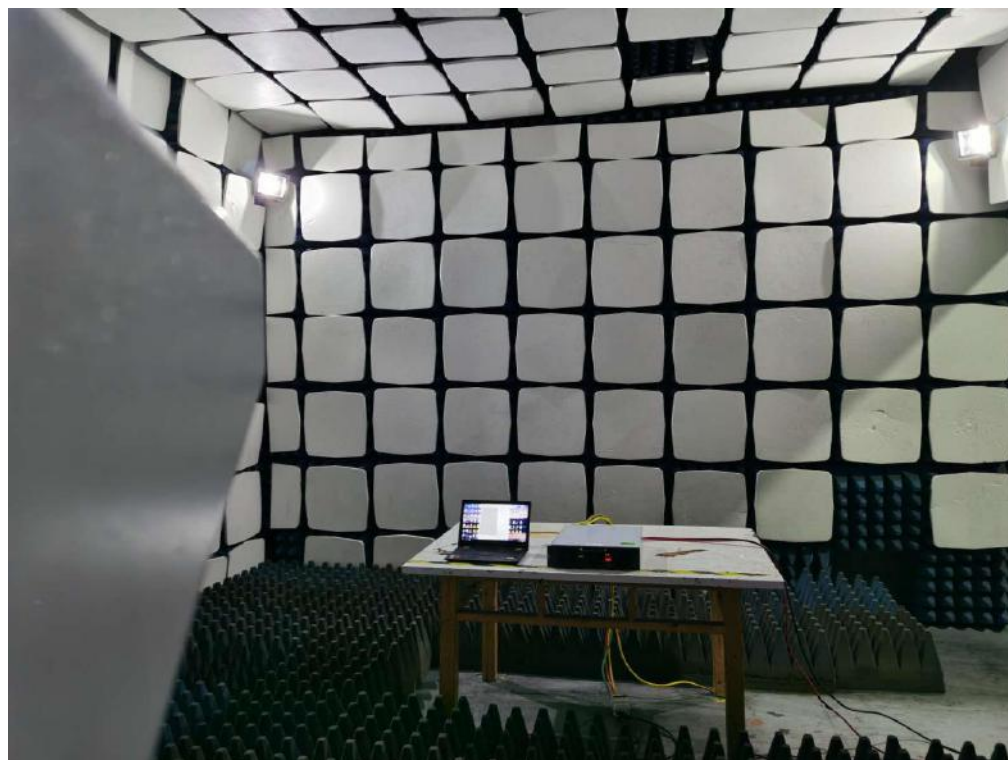
Harmonic current emissions & Flicker



Electrostatic Discharge Immunity



Radiated EM Field Immunity



Electrical fast transient (EFT) / Burst transients immunity at AC main input port



Electrical fast transient (EFT) / Burst transients immunity at DC output port



Electrical fast transient (EFT) / Burst transients immunity at Signal port



Surge transients immunity at AC main input port



Surge transients immunity at Signal port



Conducted RF disturbances immunity at AC main input port



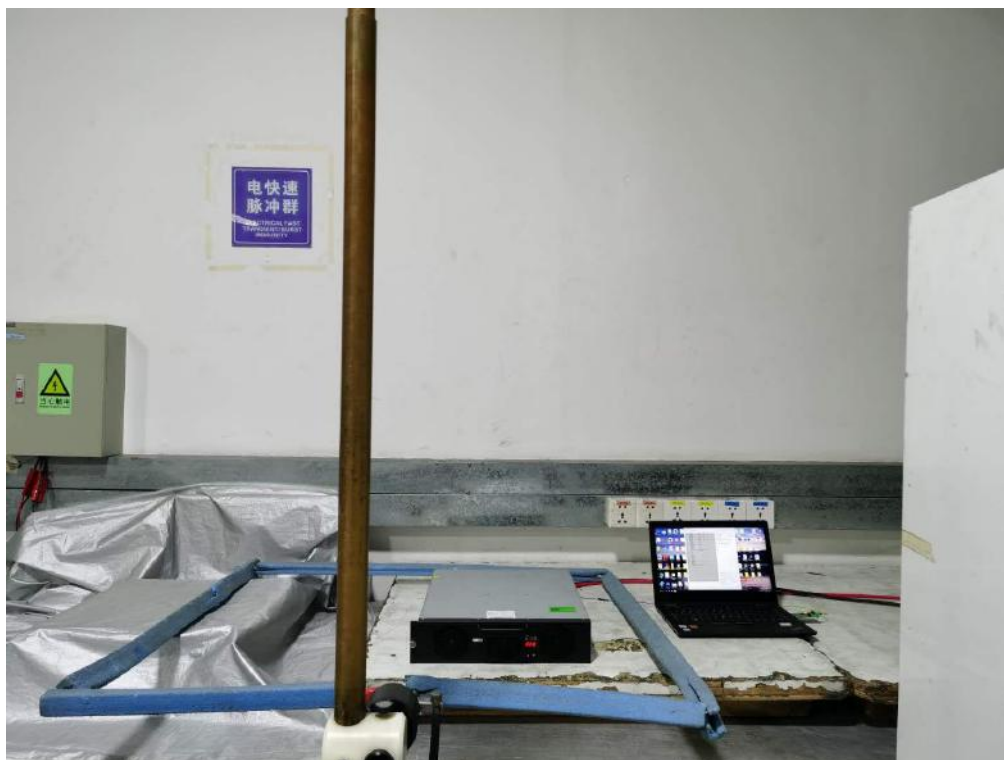
Conducted RF disturbances immunity at DC output port



Conducted RF disturbances immunity at Signal port



Power frequency magnetic field immunity



Power supply voltage interruptions & dips immunity



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