



Test report No:  
6149541.50

## TEST REPORT

### Electromagnetic Compatibility (EMC)

Identification of item tested	Energy storage systems
Trademark	CEEG
Model and /or type reference	CHIEF-5.0K-7.68kWh, CHIEF-5.0K-11.52kWh CHIEF-5.0K-15.36kWh, CHIEF-8.0K-7.68kWh CHIEF-8.0K-11.52kWh, CHIEF-8.0K-15.36kWh CHIEF-10.0K-7.68kWh, CHIEF-10.0K-11.52kWh CHIEF-10.0K-15.36kWh, CHIEF-12.0K-7.68kWh CHIEF-12.0K-11.52kWh, CHIEF-12.0K-15.36kWh
Features	See Clause 1.1 on page 7
Derived model(s)	N/A
Applicant's name / address	CEEG (Jiangsu) Tech Co., Ltd No. 69, Feitian Avenue, Jiangning Airport Economic Development Zone, Nanjing, Jiangsu Province, P.R. China
Test method requested, standard	EN IEC 61000-6-1: 2019 EN IEC 61000-6-3: 2021
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Vincent Gao Project Manager 
Approved by (name / position & signature)	Wency Yang Technical Manager 
Date of issue	July 7, 2023
Report template No	TRF_EN61000-6-3_EN61000-6-1 EMC V1.0

## INDEX

---

	<b>page</b>
Competences and Guarantees.....	4
General conditions.....	4
Uncertainty.....	4
Environmental conditions.....	4
Possible test case verdicts .....	5
Definition of symbols used in this test report.....	5
Abbreviations .....	5
Document History .....	6
Remarks and Comments .....	6
1 General Information.....	7
1.1 General Description of the Item(s).....	7
1.2 The environment(s) in which the EUT is intended to be used .....	10
1.3 Test date .....	10
2 Description of Test Setup.....	11
2.1 Operating mode(s) used for tests.....	11
2.2 Port(s) of the EUT .....	11
2.3 Support / Auxiliary equipment / unit / software for the EUT .....	11
2.4 Test Configuration / Block diagram used for tests .....	12
3 Verdict summary section .....	13
3.1 Standards.....	13
3.2 Deviation(s) from the Standard(s) / Test Specification(s) .....	13
3.3 Overview of results.....	14
3.4 Test Matrix.....	15
4 Emission Test Results.....	16
4.1 Conducted disturbance voltage – AC mains port(s) .....	16
4.2 Conducted disturbance voltage – DC power port(s).....	33
4.3 Conducted disturbance voltage – Telecommunications network port .....	38
4.4 Radiated electromagnetic disturbances (30 – 1000 MHz).....	40
4.5 Radiated electromagnetic disturbances (above 1 GHz) .....	49
4.6 Discontinuous disturbance (clicks) on AC power leads .....	51
4.7 Harmonic current emissions.....	52

4.8	Voltage changes, voltage fluctuations and flicker .....	56
5	Immunity Test Results .....	60
5.1	Performance (Compliance) criteria .....	60
5.1.1	Performance criteria related to immunity tests .....	60
5.1.2	Manufacturer defined performance criteria .....	60
5.2	Monitored – Checked Functions / Parameters .....	61
5.3	Electrostatic discharge immunity .....	62
5.4	Radio-frequency electromagnetic fields immunity .....	65
5.5	Electrical Fast Transients immunity .....	66
5.6	Surge transient immunity .....	67
5.7	Injected currents (RF common mode) immunity .....	68
5.8	Power frequency magnetic field immunity .....	69
5.9	Power supply interruptions and dips immunity .....	70
6	Identification of the Equipment Under Test .....	71
7	Annex 1 - Measurement Uncertainties .....	73
8	Annex 2 - Test Photos .....	74
9	Annex 3 - EUT Photos .....	81

## COMPETENCES AND GUARANTEES

---

DEKRA 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, DEKRA 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.

**IMPORTANT:** No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

## 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 EN 55016-4-2 (EN 55016-4-2), 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 DEKRA internal document PROD-P-EMC-M22. 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	25 % - 75 %;30 % - 60 %(ESD)
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 no.	Date	Description
6149541.50	July 7, 2023	First release.
/	/	/

## REMARKS AND COMMENTS

---

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. The test results presented in this report relate only to the object tested.
3. This report will not be used for social proof function in China market.
4. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, it is not necessary to account the uncertainty associated with the measurement result.

# 1 GENERAL INFORMATION

## 1.1 General Description of the Item(s)

Description of the item .....	Energy storage systems
Model / Type number .....	CHIEF-5.0K-7.68kWh, CHIEF-5.0K-11.52kWh CHIEF-5.0K-15.36kWh, CHIEF-8.0K-7.68kWh CHIEF-8.0K-11.52kWh, CHIEF-8.0K-15.36kWh CHIEF-10.0K-7.68kWh, CHIEF-10.0K-11.52kWh CHIEF-10.0K-15.36kWh, CHIEF-12.0K-7.68kWh CHIEF-12.0K-11.52kWh, CHIEF-12.0K-15.36kWh
Serial number .....	N/A
Trademark .....	CEEG
Manufacturer .....	CEEG (Jiangsu) Tech Co., Ltd
Address.....	No. 69, Feitian Avenue, Jiangning Airport Economic Development Zone, Nanjing, Jiangsu Province, P.R. China
Factory .....	CEEG (Jiangsu) Tech Co., Ltd
Address.....	No.6 Yuema Road, Jiangning District, Nanjing, Jiangsu Province, P.R. China

Note 1: The EUT information is from customer declaration.

Note 2: Specification of the product:

CHIEF-5.0K-7.68kWh, CHIEF-5.0K-11.52kWh, CHIEF-5.0K-15.36kWh

PV Input: MPPT voltage range: 200-750 Vdc, Max. 15 A

AC grid: 380 / 400 Vac, 50 / 60 Hz, Rated AC Current to Grid: 7.2 A, Rated AC Current from Grid: 14.4 A

Battery: 254.4~345.6 Vdc, Max. charge/discharge current: 25 / 25 A

CHIEF-8.0K-7.68kWh, CHIEF-8.0K-11.52kWh, CHIEF-8.0K-15.36kWh

PV Input: MPPT voltage range: 200-750 Vdc, Max. 15 A

AC grid: 380 / 400 Vac, 50 / 60 Hz, Rated AC Current to Grid: 11.6 A, Rated AC Current from Grid: 23.2 A

Battery: 381.6~518.4 Vdc, Max. charge/discharge current: 25 / 25 A

CHIEF-10.0K-7.68kWh, CHIEF-10.0K-11.52kWh, CHIEF-10.0K-15.36kWh

PV Input: MPPT voltage range: 200-750 Vdc, Max. 15 A

AC grid: 380 / 400 Vac, 50 / 60 Hz, Rated AC Current to Grid: 14.4 A, Rated AC Current from Grid: 24.1 A

Battery: 381.6~518.4 Vdc, Max. charge/discharge current: 25 / 25 A

CHIEF-12.0K-7.68kWh, CHIEF-12.0K-11.52kWh, CHIEF-12.0K-15.36kWh

PV Input: MPPT voltage range: 200-750 Vdc, Max. 15 A

AC grid: 380 / 400 Vac, 50 / 60 Hz, Rated AC Current to Grid: 17.4 A, Rated AC Current from Grid: 29 A

Battery: 508.8~691.2 Vdc, Max. charge/discharge current: 25 / 25 A

The tests were performed on the representative model of CHIEF-12.0K-15.36kWh and applicable for other Inverter models since they are similar in hardware and just power derating by software and can be paired with 2-4 batteries.

See next page.


Rated power supply .....	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input checked="" type="checkbox"/>	AC grid: 380 / 400 Vac, 50 / 60 Hz, Rated AC Current to Grid: 17.4 A, Rated AC Current from Grid: 29 A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	PV Input: MPPT voltage range: 200-750 Vdc, Max. 15 A					
		<input checked="" type="checkbox"/>	Battery: 508.8~691.2 Vdc, Max. charge/discharge current: 25 / 25 A				
Rated Power .....	PV input: 12 kW, AC grid: 12 kW, Battery: 12 kW						
Clock frequencies .....	< 108 MHz						
Other parameters.....	N/A						
Software version .....	1.0						
Hardware version.....	1.0						
Nominal cabinet dimensions in cm (W x D x H) .....	724 mm x 262 mm x 1720 mm						
Mounting position.....	<input type="checkbox"/>	Table top equipment					
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input checked="" type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input type="checkbox"/>	Other:					

Intended use of the Equipment Under Test (EUT)	
<p>The Energy Storage Systems combines the functions of photovoltaic inverter which converts direct current (DC) electricity from solar panels into alternating current (AC) electricity for use in the home or business, with those of a battery charger and a grid-tied inverter. It enables the simultaneous use of multiple power sources, such as solar panels, batteries, and the grid, to provide reliable and efficient power to a building or system.</p>	

No	Module/parts of test item	Type	Manufacturer
--	--	--	--
No	Documents as provided by the applicant - Description	File name	Issue date
--	--	--	--
Modifications to the test item during testing .....	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>
<u>Supplemental information:</u>			




Copy of marking plate:



**Battery Energy Storage System:**

Type	CHIEF-12.0K-15.36kWh	
PV INPUT	Max.DC input power	12000W
	Absolute max. voltage	DC 1000V
	MPPT voltage range	DC 200~750V
	Rated operating voltage	DC 600V
	Max. input current	DC 15A
	Isc PV	DC 20A
AC INPUT	Rated voltage	AC 380/400V
	Rated current	AC 29A
	Rated frequency	50/60(±0.2%)Hz
	Max.apparent power	12000VA
	Power factor	-0.9.. +0.9
AC OUTPUT	Rated power	12000W
	Rated apparent power	12000VA
	Max. apparent power	20000VA
	Rated frequency	50/60(±0.2%)Hz
	Rated voltage Rated output current	AC 380/400V AC 17.4A
	Power factor	1(-0.9... +0.9 adjustable)
EPS OUTPUT	Rated voltage	AC 380/400V
	Rated output current	AC 17.4A
	Rated frequency	50/60(±0.2%)Hz
	Rated apparent power	12000VA
	Max. apparent power	12000VA
Power factor	-0.9... +0.9	
Battery capacity	15.36kWh	
Ingress protection	IP 65	
Operation temperature range	-25°C... +60°C	
Inverter topology	Non-isolated	
Over voltage category	III (AC) , II (DC)	
Protective class	Class I	

**CEEG (Jiangsu) Tech Co., Ltd**  
 No.69, Feitian Avenue, Jiangning Airport Economic Development Zone, Nanjing  
[www.ceeg.cn](http://www.ceeg.cn) Made in China

## 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 checked="" type="checkbox"/>	Residential (domestic) environment.
<input checked="" type="checkbox"/>	Commercial and light-industrial environment.
<input type="checkbox"/>	Industrial environment.

## 1.3 Test date

Test Laboratory	Hongyue Testing Technology (Shanghai) Co., Ltd. (CNAS L15308)
Test Location	Room 102&202, Building 12, Lane 1288, Luoning Road, Baoshan District, Shanghai, P.R. China
Date(receive sample)	May 16, 2023 (Delivered by Client)
Date (start)	May 16, 2023
Date (finish)	Jun 28, 2023

The EMC tests have been conducted by Hongyue Testing Technology (Shanghai) Co., Ltd under supervision of DEKRA's engineer.

## 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	PV supply to Grid (HV)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	PV supply to Gird (NV)	<input type="checkbox"/>	<input type="checkbox"/>
3	PV supply to Gird (LV)	<input type="checkbox"/>	<input type="checkbox"/>
4	Battery supply to Gird	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	Battery and PV supply to Grid	<input type="checkbox"/>	<input type="checkbox"/>
6	AC supply to Battery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	PV supply to Grid and Battery	<input checked="" type="checkbox"/>	<input checked="" 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	With Core	Shielded
DC input port	DC Source	1,5 m	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC grid port	LV power grid	1,5 m	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Supplemental information:</u>					

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

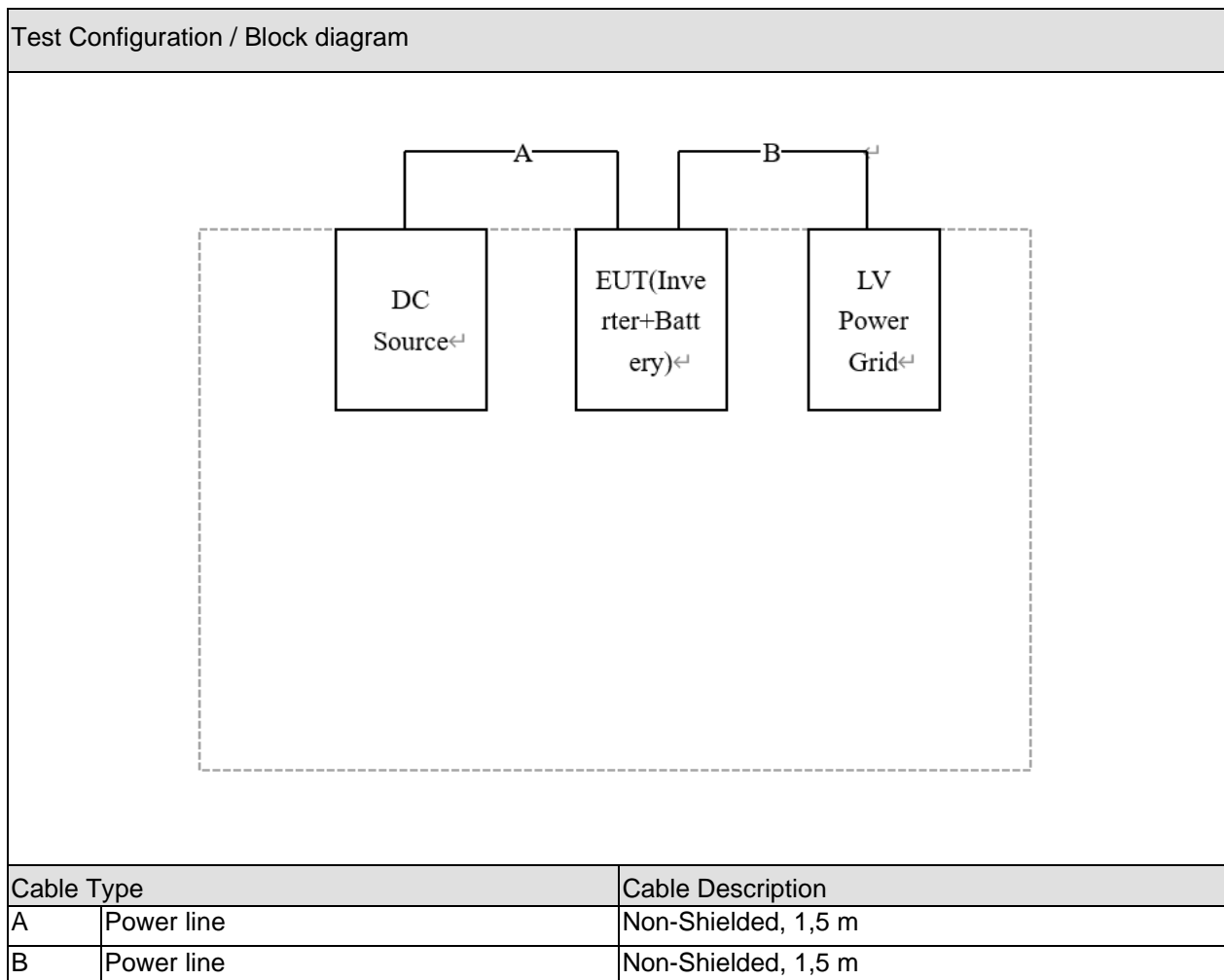
The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
DC source	ANEVH1500-40	Ainuo	Applicant
N/A	N/A	N/A	N/A
<u>Supplemental information:</u>			

## 2.4 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests:

Test Item		EMI / EMS			
Product		Manufacturer	Model No.	Serial No.	Power Cord
1	DC Source	Ainuo	ANEVH1500-40	2301EVH013	Non-Shielded, 2,0 m
2	---	---	---	---	---



### 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
EN IEC 61000-6-3	2021	Generic standards - Emission standard for residential, commercial and light-industrial environments.
EN 55016-2-1 +A1	2014 2017	Methods of measurement of disturbances and immunity - Conducted disturbance measurements.
EN 55016-2-3	2017	Methods of measurement of disturbances and immunity - Radiated disturbance measurements.
EN 55032 +A1	2015 2020	Electromagnetic compatibility of multimedia equipment - Emission requirements.
EN IEC 55014-1	2021	Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission.
EN IEC 61000-3-2 +A1	2019 2021	Limits for harmonic current emissions (equipment input current $\leq 16$ A per phase).
EN 61000-3-3 +A1 +A2	2013 2019 2021	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16$ A per phase and not subject to conditional connection.
EN 61000-3-12	2011	Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current $> 16$ A and $\leq 75$ A per phase.
EN IEC 61000-3-11	2019	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current $\leq 75$ A and subject to conditional connection.
EN IEC 61000-6-1	2019	Generic standards - Immunity for residential, commercial and light-industrial environments.
EN 61000-4-2	2009	Electrostatic discharge immunity test.
EN IEC 61000-4-3	2020	Radiated, radio-frequency, electromagnetic field immunity test.
EN 61000-4-4	2012	Electrical fast transient/burst immunity test.
EN 61000-4-5 +A1	2014 2017	Surge immunity test.
EN 61000-4-6 +AC	2014 2015	Immunity to conducted disturbances, induced by radio-frequency fields.
EN 61000-4-8	2010	Power frequency magnetic field immunity test.
EN IEC 61000-4-11	2020	Voltage dips, short interruptions and voltage variations immunity tests.

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

No deviation.

### 3.3 Overview of results

EMISSION TESTS – EN IEC 61000-6-3			
Requirement – Test case	Basic standard(s)	Verdict	Remark
Conducted disturbance voltage at AC power port(s)	EN 55016-2-1	PASS	---
Conducted disturbance voltage at DC power port(s)	EN 55016-2-1	PASS	---
Conducted disturbance voltage at Telecommunications / network port(s)	EN 55032, EN 55016-2-1	N/A	See 2)
Radiated electromagnetic disturbances (30 MHz to 1000 MHz)	EN 55016-2-3	PASS	---
Radiated electromagnetic disturbances (above 1 GHz)	EN 55016-2-3	N/A	See 3)
Discontinuous disturbance (clicks) on AC power leads	EN IEC 55014-1	N/A	See 4)
Harmonic current emissions	EN IEC 61000-3-2 EN 61000-3-12	PASS	---
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3 EN IEC 61000-3-11	PASS	---
<b>Supplementary information:</b>			
1) The EUT does not have a AC power port. 2) The EUT has no wired network port. 3) The highest internal frequency of the EUT is less than 108 MHz. 4) Exemptions from click measurements applicable (clause 4.2.3).			

IMMUNITY TESTS – EN IEC 61000-6-1			
Requirement – Test case	Basic standard(s)	Verdict	Remark
Electrostatic discharge	EN 61000-4-2	PASS	---
Radio-frequency electromagnetic fields	EN 61000-4-3	PASS	---
Fast transients	EN 61000-4-4	PASS	---
Surge transient	EN 61000-4-5	PASS	---
Injected currents (radio-frequency common mode)	EN 61000-4-6	PASS	---
Power frequency magnetic fields	EN 61000-4-8	PASS	---
Voltage dips and short interruptions	EN 61000-4-11	PASS	---
<b>Supplementary information:</b>			
1) Applicable only to input ports. 2) Not applicable because no test requirements have been specified for DC/battery powered apparatus.			

### 3.4 Test Matrix

EMISSION TESTS	Model / Type			
	Mode 1	Mode 4	Mode6	Mode 7
Conducted disturbance voltage at AC power port(s) (150 kHz – 30 MHz)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Conducted disturbance voltage at DC power port(s) (150 kHz – 30 MHz)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Conducted disturbance voltage at telecommunications/ network port (150 kHz – 30 MHz)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated electromagnetic disturbances (30 MHz to 1000 MHz)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Radiated electromagnetic disturbances (above 1 GHz)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discontinuous disturbance (clicks) on AC power leads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harmonic current emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Voltage changes, voltage fluctuations and flicker	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Supplementary: Information:</u>				

IMMUNITY TESTS	Model / Type			
	Mode 1	Mode 4	Mode6	Mode 7
Electrostatic discharge	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Radio-frequency electromagnetic fields	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fast transients	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Surges	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Injected currents (radio-frequency common mode)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Power frequency magnetic field immunity	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Voltage dips and short interruptions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Supplementary: Information:</u>				

## 4 EMISSION TEST RESULTS

4.1 Conducted disturbance voltage – AC mains port(s)	VERDICT: PASS
--	---------------

Standard	EN IEC 61000-6-3
Basic standard(s)	EN 55016-2-1

### AC Limits

Frequency range [MHz]	Limit: QP [dB(μV) <sup>1)</sup>	Limit: AV [dB(μV) <sup>1)</sup>	IF BW	Detector(s)
0,15 – 0,50	66 – 56 <sup>2)</sup>	56 – 46 <sup>2)</sup>	9 kHz	QP, CAV
0,50 – 5,0	56	46	9 kHz	QP, CAV
5,0 – 30	60	50	9 kHz	QP, CAV

<sup>1)</sup> At the transition frequency, the lower limit applies.

<sup>2)</sup> The limit decreases linearly with the logarithm of the frequency.

### Performed measurements

Port under test		Terminal							
<input checked="" type="checkbox"/>	AC grid port	<input checked="" type="checkbox"/>	N	<input checked="" type="checkbox"/>	L1	<input checked="" type="checkbox"/>	L2	<input checked="" type="checkbox"/>	L3
<input type="checkbox"/>	Other:	<input type="checkbox"/>	N	<input type="checkbox"/>	L1	<input type="checkbox"/>	L2	<input type="checkbox"/>	L3
Voltage – Mains [V]	Input: 600 Vdc, 614 Vdc, Output: 380 Vac, 50 Hz								
Frequency – Mains [Hz]	50 Hz								
Test method applied	<input checked="" type="checkbox"/>	Artificial mains network							
	<input type="checkbox"/>	Voltage probe							
Test setup	<input type="checkbox"/>	Table top	<input type="checkbox"/>	Artificial hand applied					
	<input checked="" type="checkbox"/>	Floor standing	<input type="checkbox"/>	Other:					
	Refer to the Annex 2 for test setup photo(s).								
Operating mode(s) used	Mode 1, 4, 6, 7								
Remark	---								

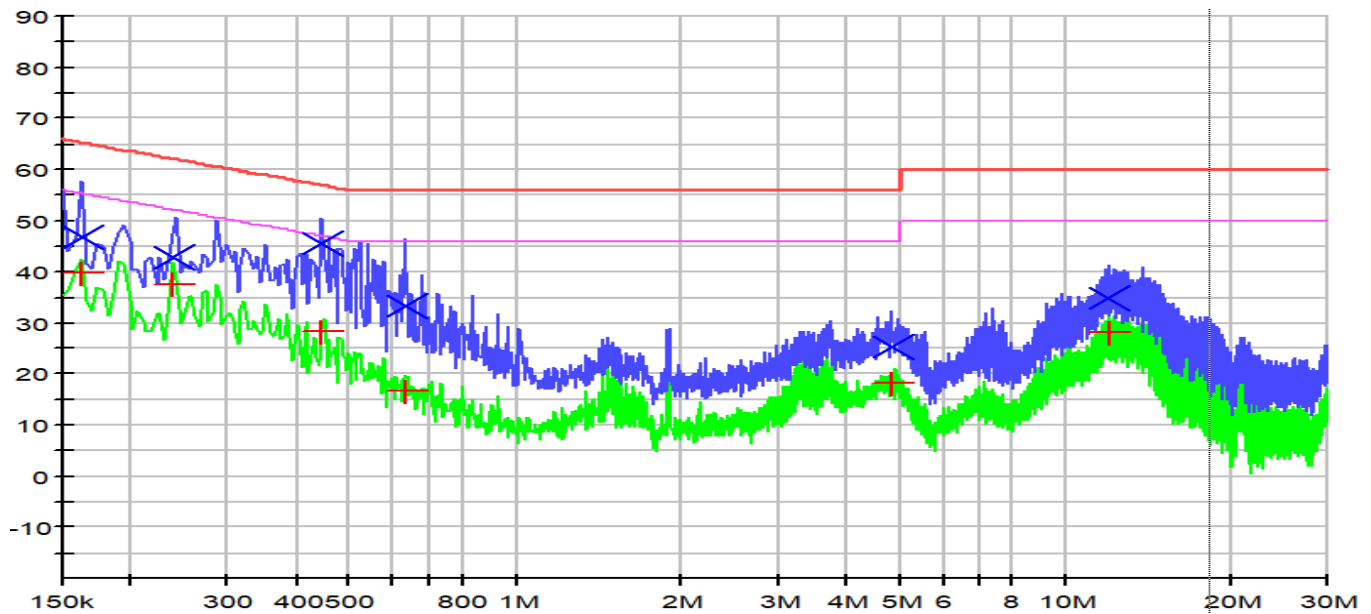
See next page.



<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 11,5
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 1
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz
Note: PV 12kW to Grid (High Voltage)	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,162000	46,7	39,7	18,7	65,4	15,6	55,4	9,9	L1
2		0,237500	42,7	37,5	19,5	62,2	14,7	52,2	9,9	L1
3	*	0,446000	45,4	28,4	11,5	56,9	18,5	46,9	9,9	L1
4		0,630000	33,2	16,7	22,8	56,0	29,3	46,0	9,9	L1
5		4,850000	25,4	18,2	30,6	56,0	27,8	46,0	10,0	L1
6		12,030000	34,9	28,0	25,1	60,0	22,0	50,0	10,3	L1

**Note:**

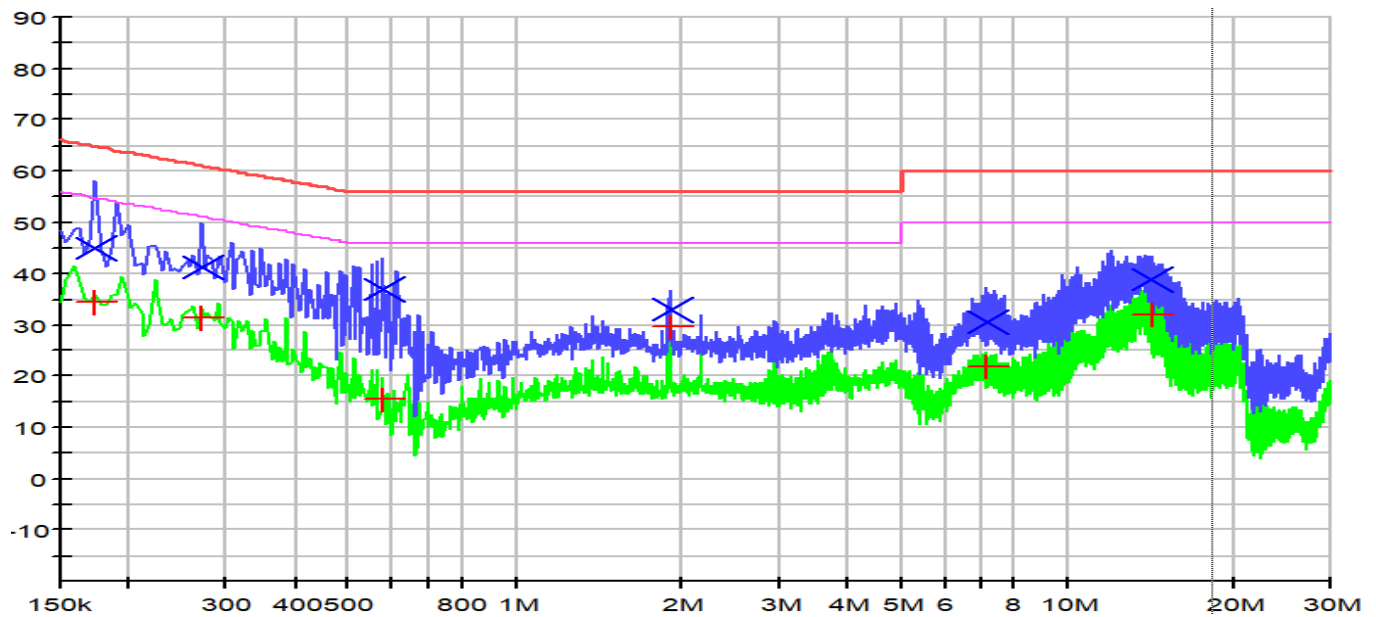
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 16,5
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 2
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz
Note: PV 12kW to Grid (High Voltage)	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,174000	44,9	34,4	19,9	64,8	20,3	54,8	9,9	L2
2		0,270000	41,3	31,4	19,8	61,1	19,7	51,1	9,9	L2
3		0,574000	37,0	15,4	19,0	56,0	30,6	46,0	9,9	L2
4	*	1,906000	33,1	29,5	23,0	56,0	16,5	46,0	10,0	L2
5		7,102000	30,6	21,9	29,4	60,0	28,1	50,0	10,1	L2
6		14,258000	38,8	32,1	21,2	60,0	17,9	50,0	10,4	L2

Note:

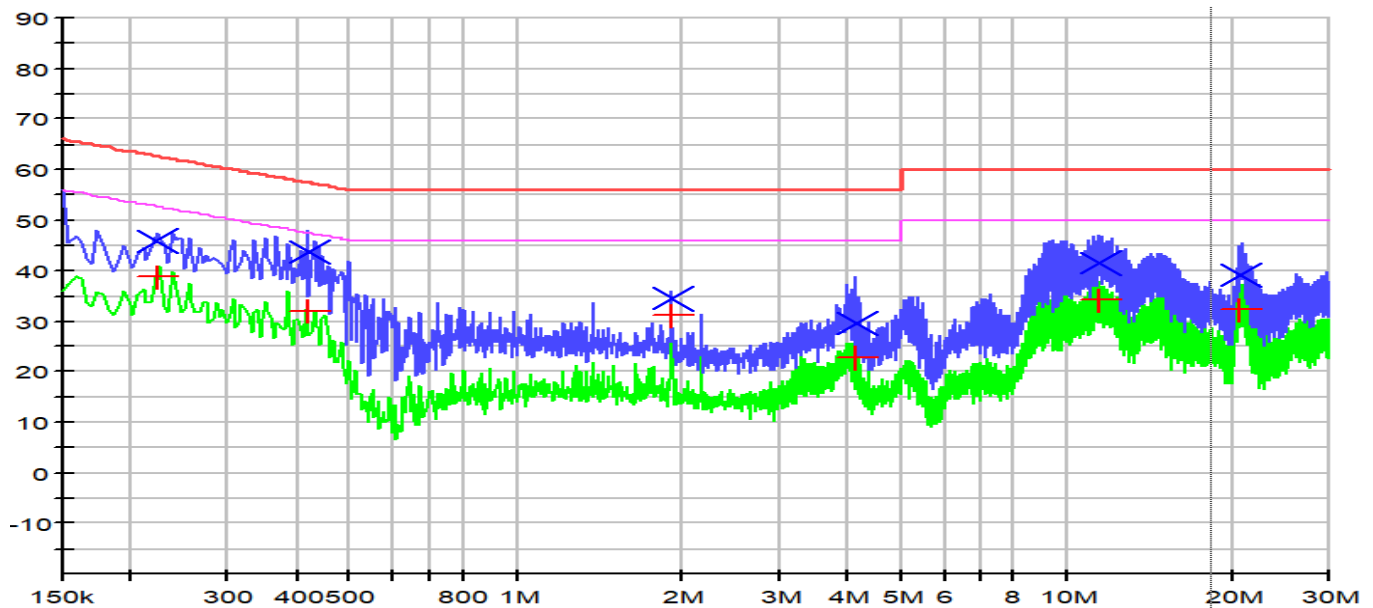
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 13,8
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 3
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz
Note: PV 12kW to Grid (High Voltage)	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1	*	0,222000	46,0	38,9	16,7	62,7	13,8	52,7	9,9	L3
2	*	0,418000	43,7	32,2	13,8	57,5	15,3	47,5	9,9	L3
3		1,914000	34,6	31,2	21,4	56,0	14,8	46,0	10,0	L3
4		4,114000	29,8	22,9	26,2	56,0	23,1	46,0	10,0	L3
5		11,474000	41,5	34,3	18,5	60,0	15,7	50,0	10,3	L3
6		20,762000	39,1	32,3	20,9	60,0	17,7	50,0	10,6	L3

**Note:**

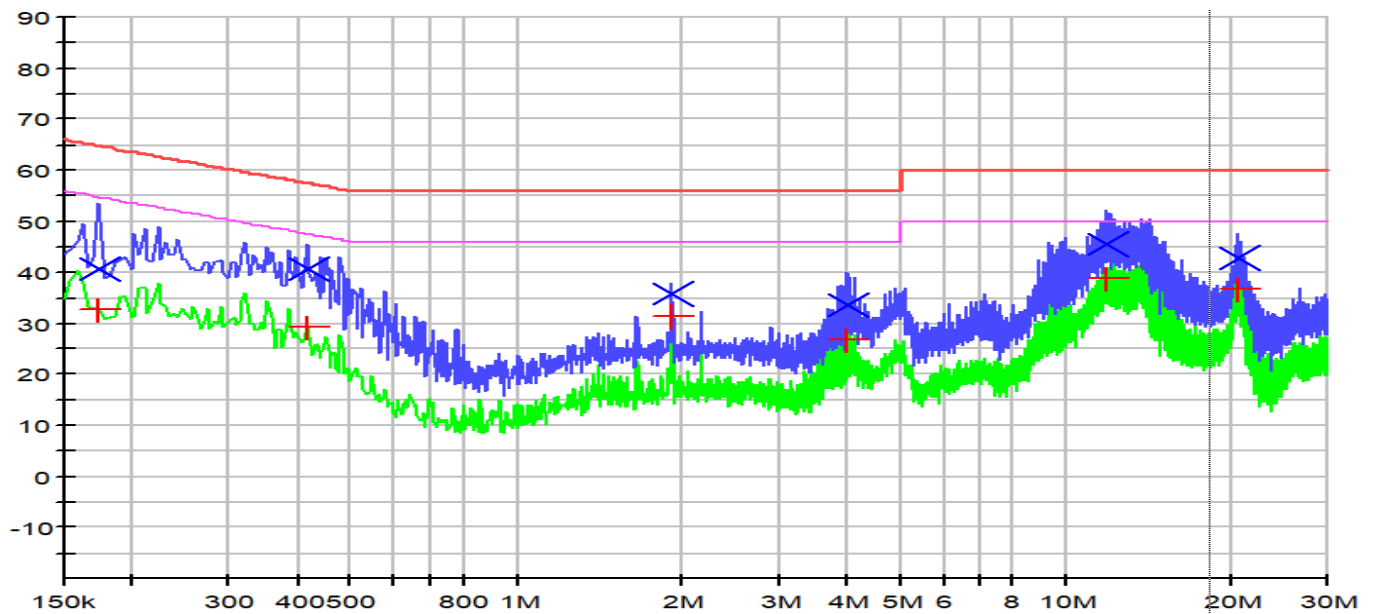
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 11,2
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Neutral
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz
Note: PV 12kW to Grid (High Voltage)	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,174000	40,6	32,7	24,2	64,8	22,1	54,8	9,9	N
2		0,414000	40,7	29,4	16,9	57,6	18,2	47,6	9,9	N
3		1,918000	35,7	31,6	20,3	56,0	14,4	46,0	10,0	N
4		4,018000	33,6	26,9	22,4	56,0	19,1	46,0	10,0	N
5	*	11,890000	45,7	38,8	14,3	60,0	11,2	50,0	10,3	N
6		20,734000	42,7	36,7	17,3	60,0	13,3	50,0	10,6	N

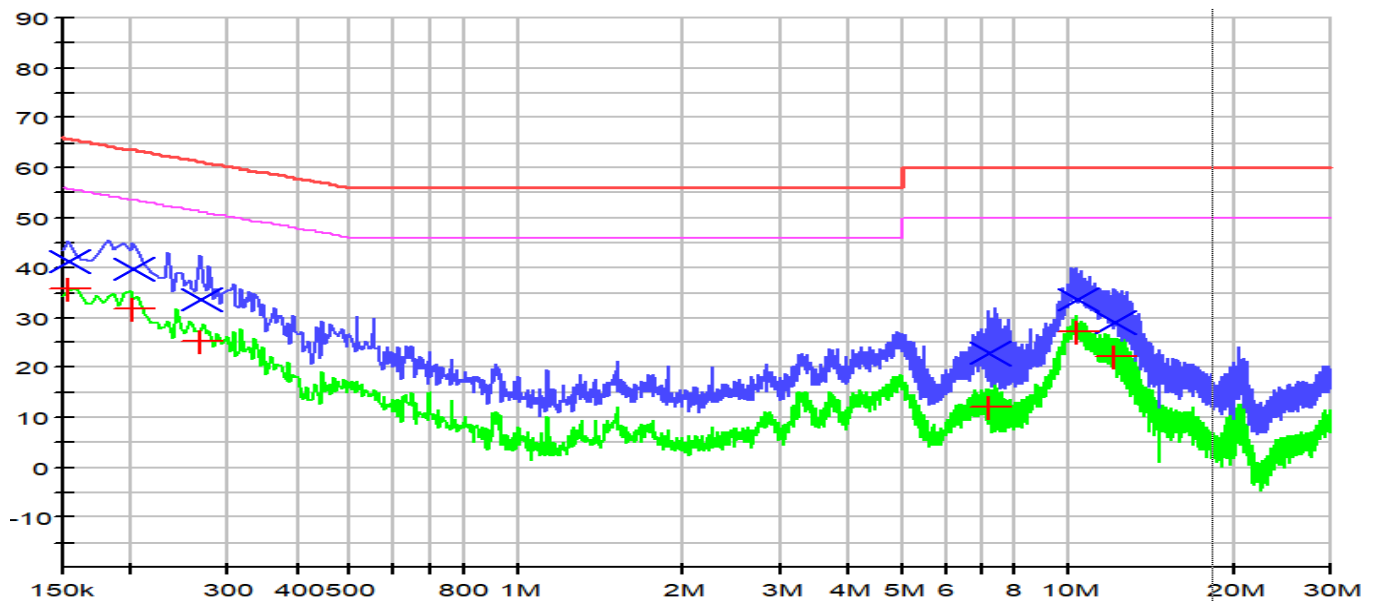
Note:  
 1. " \* ", means this data is the worst emission level.  
 2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 4 / Input: 614 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/06
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 21,7
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 1
EUT: Energy storage systems	Power: Input: 614 Vdc, Output: 380 Vac, 50 Hz
Note: Battery 12kW to Grid	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,154000	41,2	35,8	24,6	65,8	20,0	55,8	9,9	L1
2	*	0,202000	39,9	31,8	23,6	63,5	21,7	53,5	9,9	L1
3		0,266000	33,5	25,3	27,7	61,2	25,9	51,2	9,9	L1
4		7,170000	22,8	12,2	37,2	60,0	37,8	50,0	10,0	L1
5		10,294000	33,6	27,0	26,4	60,0	23,0	50,0	10,2	L1
6		12,194000	29,0	22,1	31,0	60,0	27,9	50,0	10,4	L1

Note:

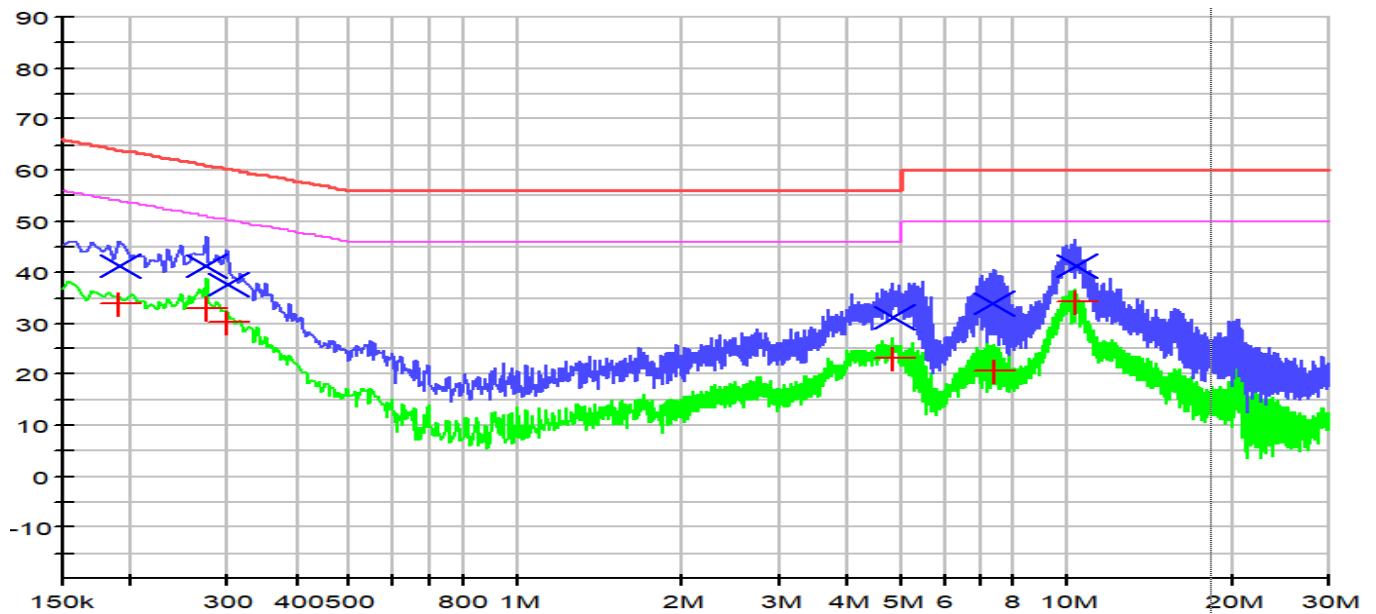
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 4 / Input: 614 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/06
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 15,8
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 2
EUT: Energy storage systems	Power: Input: 614 Vdc, Output: 380 Vac, 50 Hz
Note: Battery 12kW to Grid	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,190000	41,4	34,0	22,7	64,0	20,1	54,0	9,9	L2
2		0,274000	41,2	33,1	19,8	61,0	17,9	51,0	9,9	L2
3		0,298000	37,7	30,3	22,6	60,3	20,0	50,3	9,9	L2
4		4,830000	31,1	23,2	24,9	56,0	22,8	46,0	10,0	L2
5		7,330000	33,9	20,8	26,1	60,0	29,2	50,0	10,0	L2
6	*	10,310000	41,4	34,2	18,6	60,0	15,8	50,0	10,2	L2

**Note:**

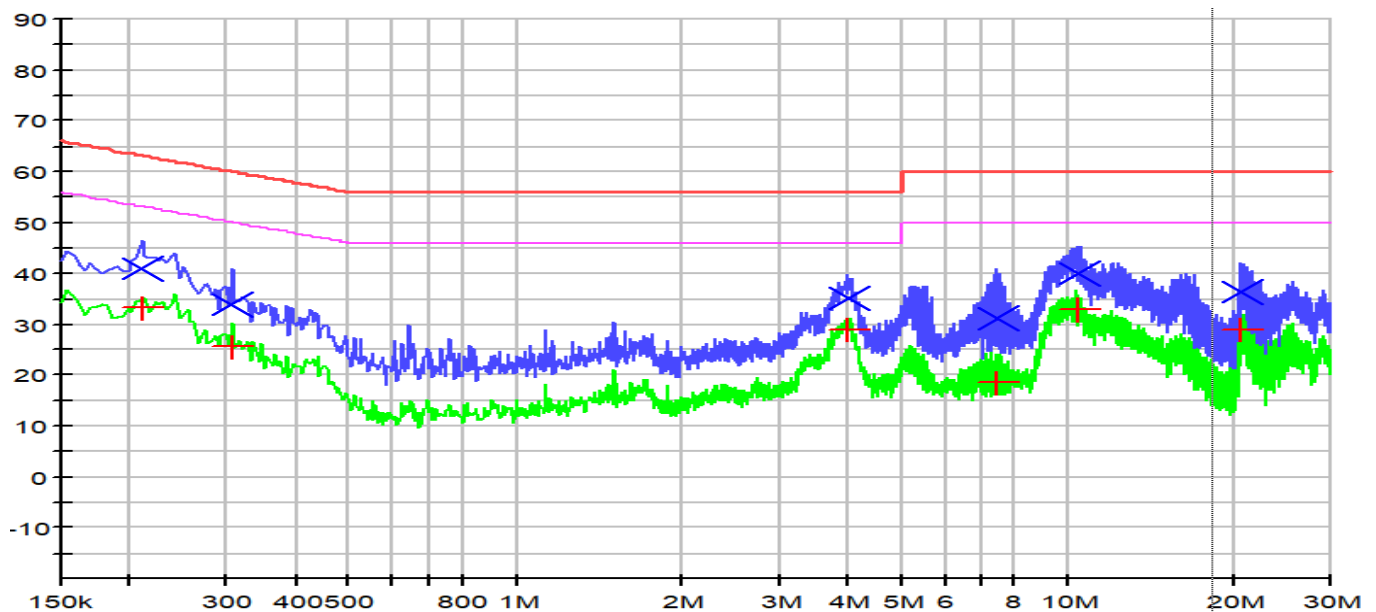
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 4 / Input: 614 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/06
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 16,9
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 3
EUT: Energy storage systems	Power: Input: 614 Vdc, Output: 380 Vac, 50 Hz
Note: Battery 12kW to Grid	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,210000	41,1	33,2	22,1	63,2	20,0	53,2	9,9	L3
2		0,306000	33,9	25,8	26,2	60,1	24,3	50,1	9,9	L3
3		3,986000	35,2	28,9	20,8	56,0	17,1	46,0	10,0	L3
4		7,442000	31,1	18,7	28,9	60,0	31,3	50,0	10,1	L3
5	*	10,410000	40,1	33,1	19,9	60,0	16,9	50,0	10,2	L3
6		20,738000	36,3	29,1	23,7	60,0	20,9	50,0	10,9	L3

**Note:**

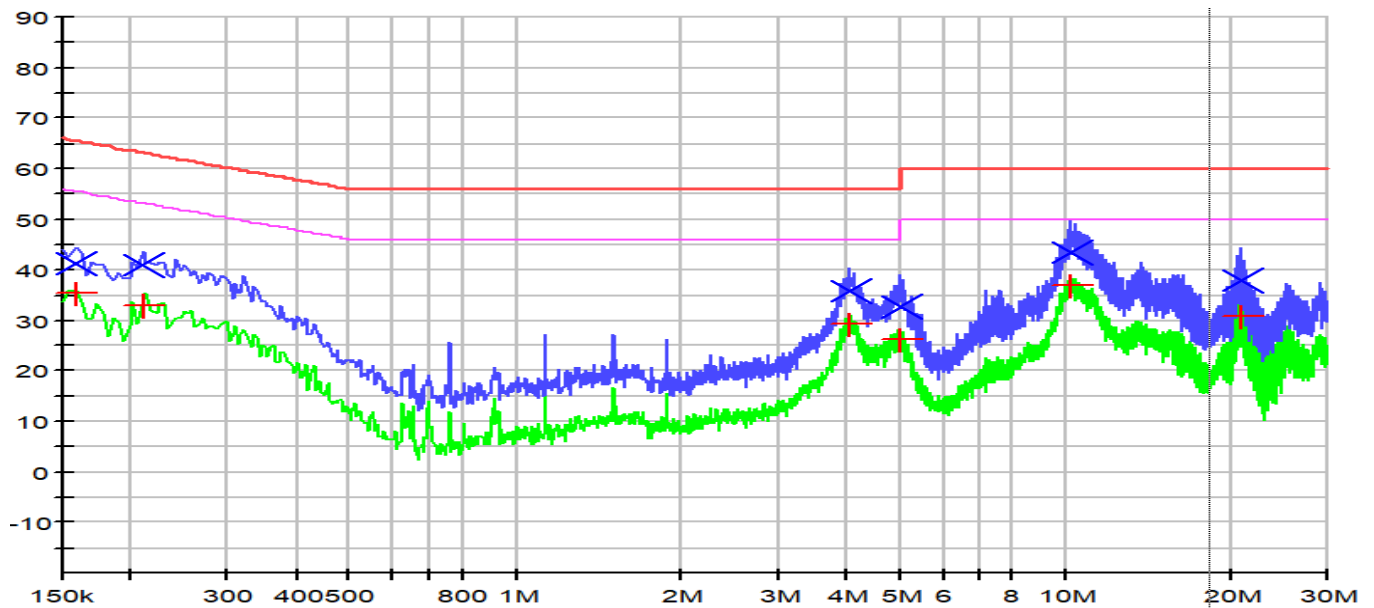
- " \* ", means this data is the worst emission level.
- Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 4 / Input: 614 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/06
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 13,1
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Neutral
EUT: Energy storage systems	Power: Input: 614 Vdc, Output: 380 Vac, 50 Hz
Note: Battery 12kW to Grid	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,158000	41,3	35,6	24,3	65,6	20,0	55,6	9,9	N
2		0,210000	41,0	33,0	22,2	63,2	20,2	53,2	9,9	N
3		4,034000	35,8	29,5	20,2	56,0	16,5	46,0	10,0	N
4		4,994000	32,7	26,2	23,3	56,0	19,8	46,0	10,0	N
5	*	10,214000	43,5	36,9	16,5	60,0	13,1	50,0	10,2	N
6		20,814000	37,8	30,8	22,2	60,0	19,2	50,0	10,7	N

**Note:**

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

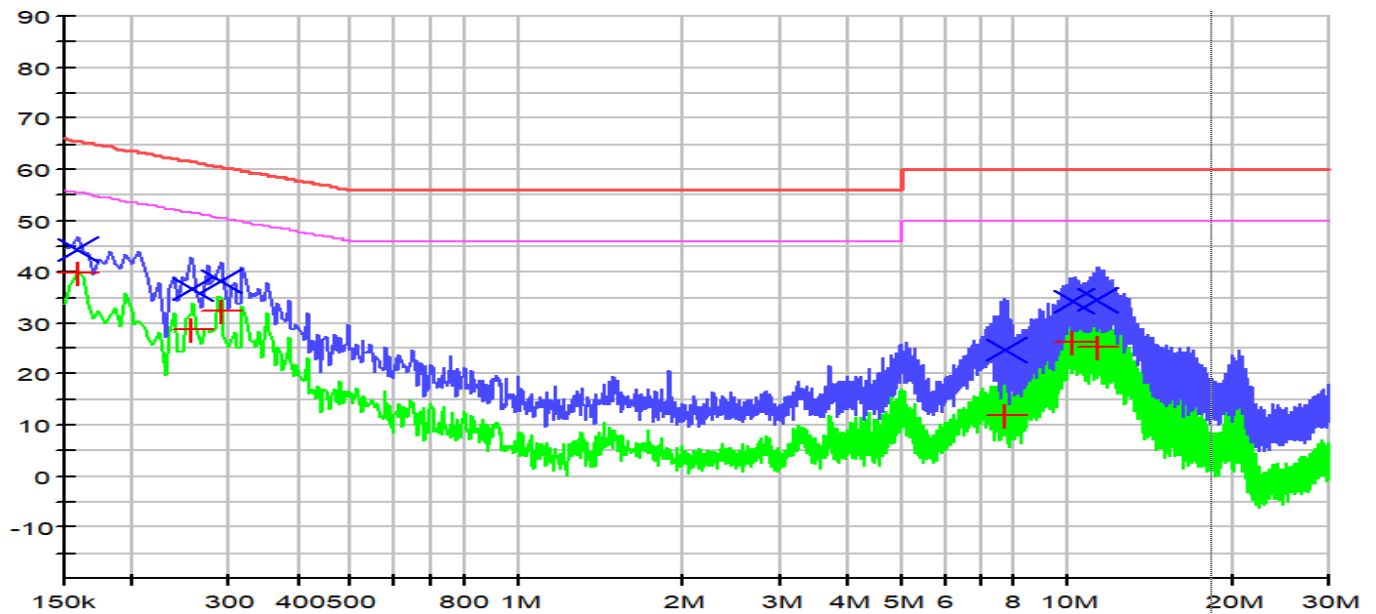
Remark	
--------	--



<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 6 / Output: 380 Vac, 50 Hz, Input: 614 Vdc
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/06
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 15,8
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 1
EUT: Energy storage systems	Power: Output: 380 Vac, 50 Hz, Input: 614 Vdc
Note: AC Charge Battery 12kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1	*	0,158000	44,5	39,8	21,1	65,6	15,8	55,6	9,9	L1
2		0,254000	36,6	28,8	25,1	61,6	22,8	51,6	9,9	L1
3		0,290000	38,3	32,5	22,2	60,5	18,0	50,5	9,9	L1
4		7,702000	24,6	11,8	35,4	60,0	38,2	50,0	10,1	L1
5		10,202000	34,4	26,1	25,6	60,0	23,9	50,0	10,2	L1
6		11,370000	34,7	25,4	25,3	60,0	24,7	50,0	10,3	L1

Note:

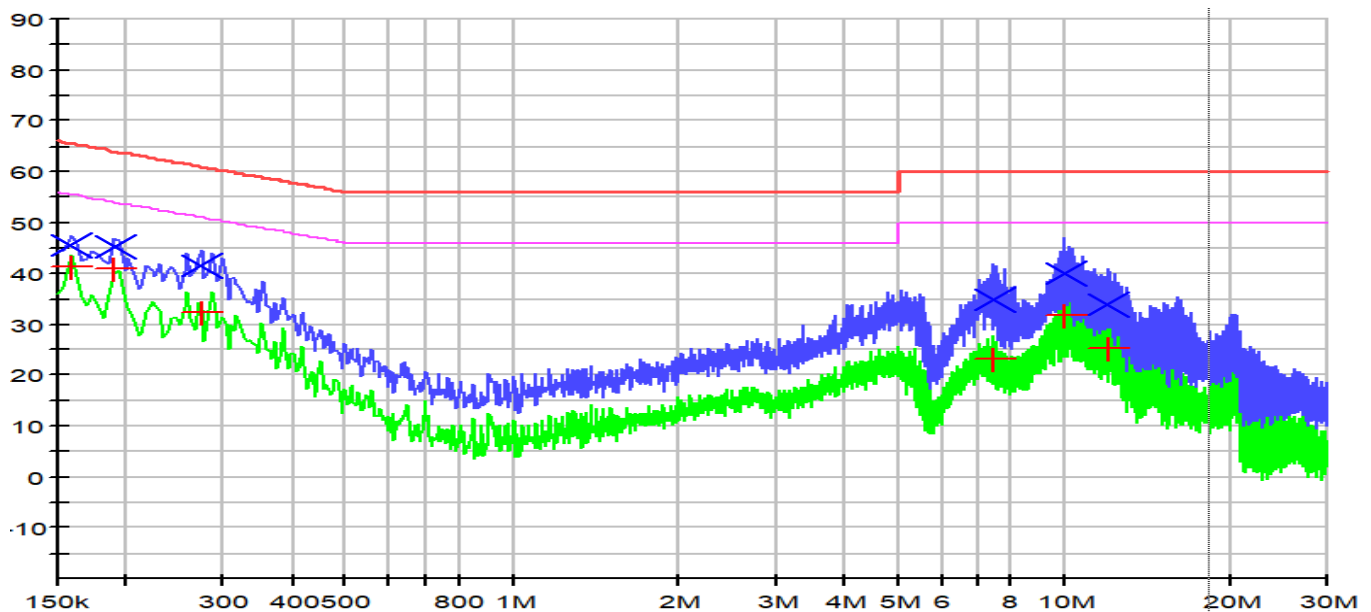
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 6 / Output: 380 Vac, 50 Hz, Input: 614 Vdc
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/06
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 13,1
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 2
EUT: Energy storage systems	Power: Output: 380 Vac, 50 Hz, Input: 614 Vdc
Note: AC Charge Battery 12kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,158000	45,7	41,3	19,9	65,6	14,3	55,6	9,9	L2
2	*	0,190000	45,4	41,0	18,7	64,0	13,1	54,0	9,9	L2
3		0,274000	41,5	32,4	19,5	61,0	18,6	51,0	9,9	L2
4		7,490000	34,8	23,2	25,2	60,0	26,8	50,0	10,1	L2
5		10,018000	40,2	31,9	19,8	60,0	18,1	50,0	10,2	L2
6		12,030000	34,1	25,3	25,9	60,0	24,7	50,0	10,3	L2

**Note:**

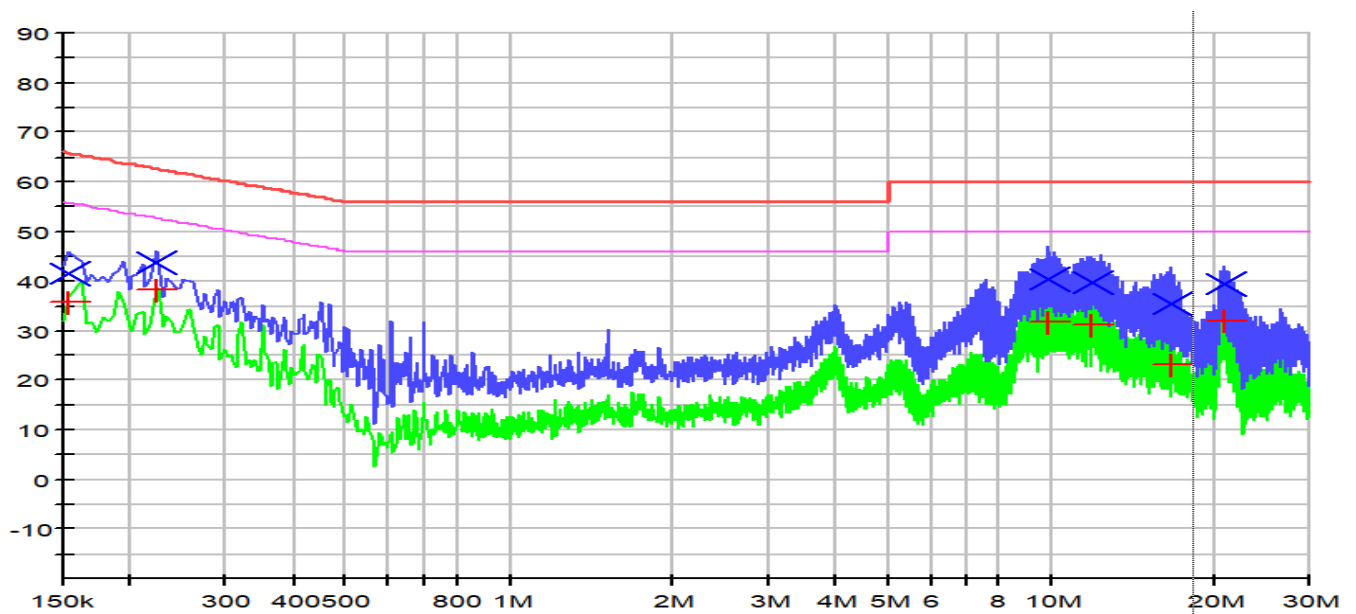
- " \* ", means this data is the worst emission level.
- Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 6 / Output: 380 Vac, 50 Hz, Input: 614 Vdc
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/06
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 14,5
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 3
EUT: Energy storage systems	Power: Output: 380 Vac, 50 Hz, Input: 614 Vdc
Note: AC Charge Battery 12kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,154000	41,4	35,8	24,3	65,8	20,0	55,8	9,9	L3
2	*	0,222000	43,7	38,2	19,0	62,7	14,5	52,7	9,9	L3
3		9,946000	40,3	31,7	19,7	60,0	18,3	50,0	10,2	L3
4		11,858000	39,8	31,2	20,2	60,0	18,8	50,0	10,3	L3
5		16,630000	35,4	23,2	24,6	60,0	26,8	50,0	10,6	L3
6		20,862000	39,5	32,0	20,5	60,0	18,0	50,0	10,9	L3

Note:

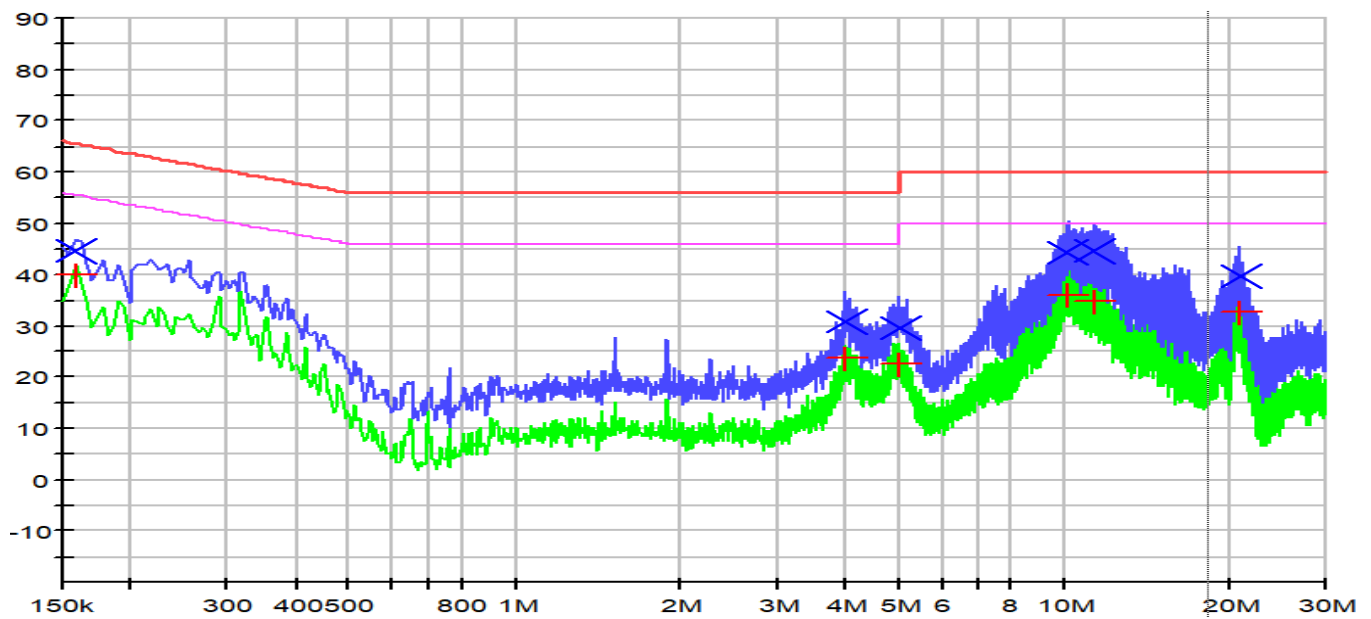
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 6 / Output: 380 Vac, 50 Hz, input: 614 Vdc
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/05/11
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 14,0
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Neutral
EUT: Energy storage systems	Power: Output: 380 Vac, 50 Hz, Input: 614 Vdc
Note: AC Charge Battery 12kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,158000	44,7	40,2	20,9	65,6	15,4	55,6	9,9	N
2		4,002000	30,9	23,9	25,1	56,0	22,1	46,0	10,0	N
3		4,998000	29,7	22,5	26,3	56,0	23,5	46,0	10,0	N
4	*	10,066000	44,5	36,0	15,5	60,0	14,0	50,0	10,2	N
5		11,366000	44,7	34,9	15,3	60,0	15,1	50,0	10,3	N
6		20,834000	39,7	32,6	20,3	60,0	17,4	50,0	10,7	N

**Note:**

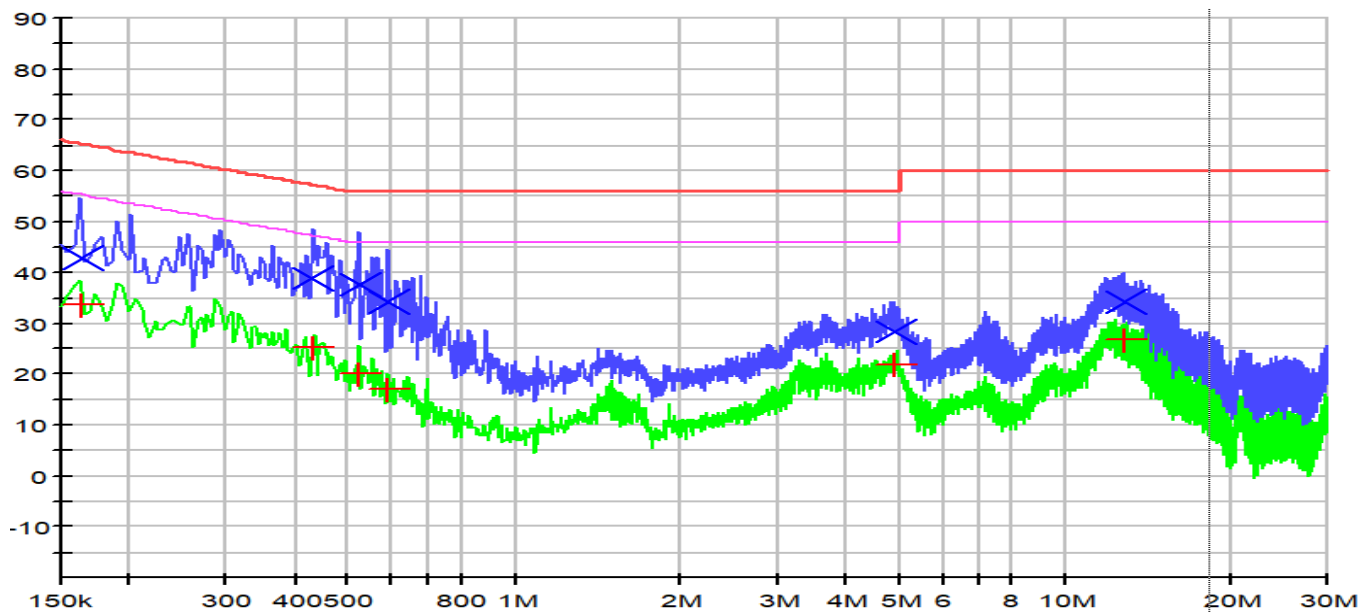
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 7 / Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
--------------------------	--

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 18,3
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 1
EUT: Energy storage systems	Power: Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
Note: PV 12kW to Grid 6kW + Battery 6kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,164000	42,9	33,7	22,4	65,3	21,5	55,3	9,9	L1
2	*	0,430000	38,9	25,5	18,3	57,3	21,8	47,3	9,9	L1
3	*	0,522000	37,7	20,2	18,3	56,0	25,8	46,0	9,9	L1
4		0,590000	34,1	17,2	21,9	56,0	28,8	46,0	9,9	L1
5		4,914000	28,5	21,9	27,5	56,0	24,1	46,0	10,0	L1
6		12,866000	34,1	27,0	25,9	60,0	23,0	50,0	10,3	L1

**Note:**

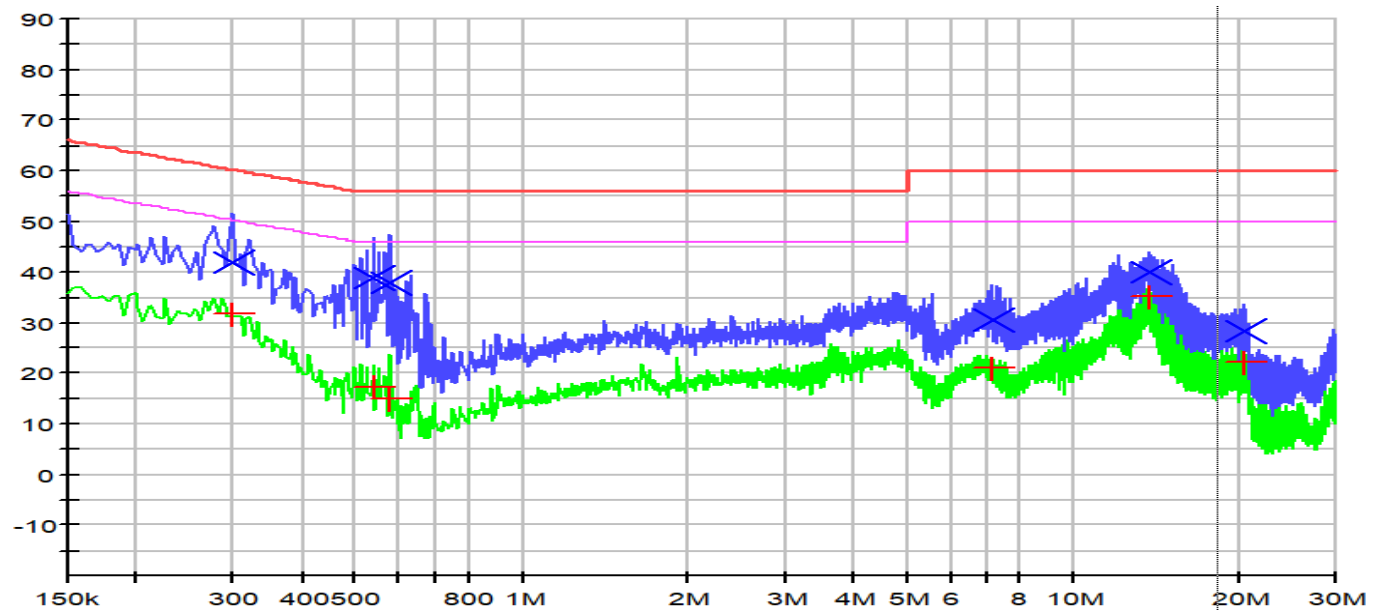
- " \* ", means this data is the worst emission level.
- Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 7 / Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
--------------------------	--

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 14,7
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 2
EUT: Energy storage systems	Power: Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
Note: PV 12kW to Grid 6kW + Battery 6kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,298000	41,8	31,8	18,5	60,3	18,5	50,3	9,9	L2
2		0,538000	38,7	17,4	17,3	56,0	28,6	46,0	9,9	L2
3		0,578000	37,8	15,0	18,2	56,0	31,0	46,0	9,9	L2
4		7,106000	30,5	21,0	29,5	60,0	29,0	50,0	10,1	L2
5	*	13,710000	40,2	35,3	19,8	60,0	14,7	50,0	10,4	L2
6		20,494000	28,4	22,2	31,6	60,0	27,8	50,0	10,6	L2

**Note:**

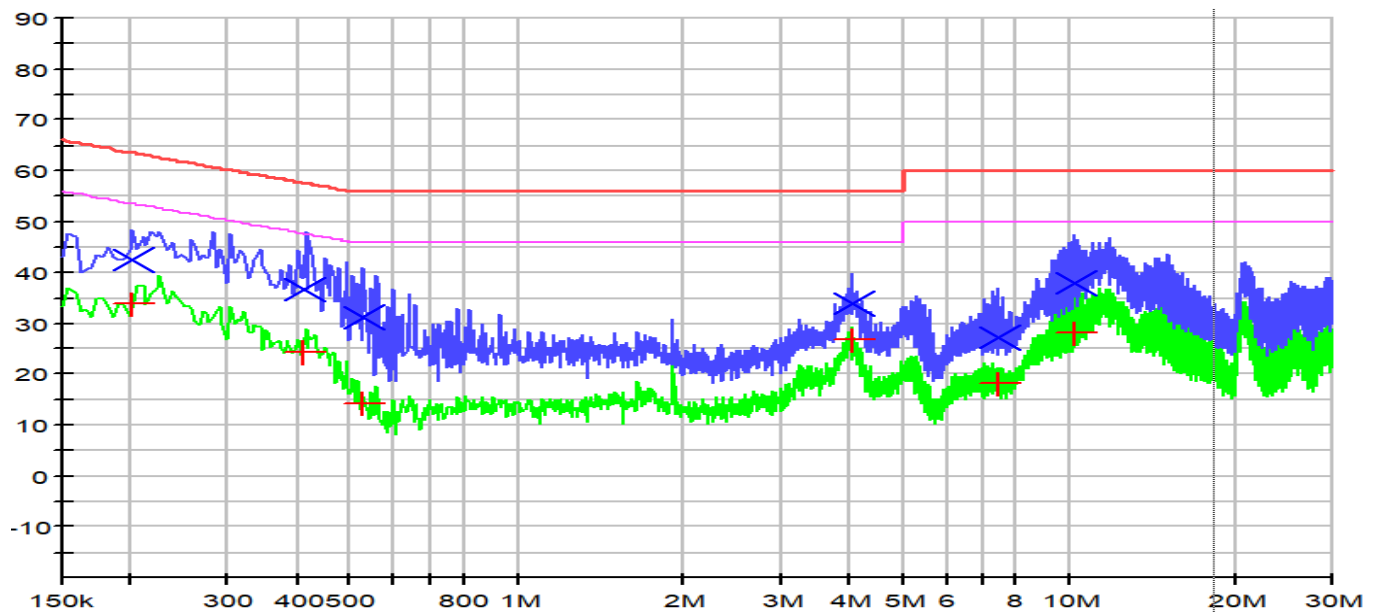
- " \* ", means this data is the worst emission level.
- Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 7 / Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
--------------------------	--

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 19,2
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Line 3
EUT: Energy storage systems	Power: Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
Note: PV 12kW to Grid 6kW + Battery 6kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,202000	42,6	33,9	20,9	63,5	19,6	53,5	9,9	L3
2		0,409000	36,8	24,3	20,9	57,7	23,4	47,7	9,9	L3
3		0,530000	31,3	14,3	24,7	56,0	31,7	46,0	9,9	L3
4	*	4,050000	34,0	26,8	22,0	56,0	19,2	46,0	10,0	L3
5		7,486000	27,2	18,4	32,8	60,0	31,6	50,0	10,2	L3
6		10,186000	38,0	28,1	22,0	60,0	21,9	50,0	10,3	L3

**Note:**

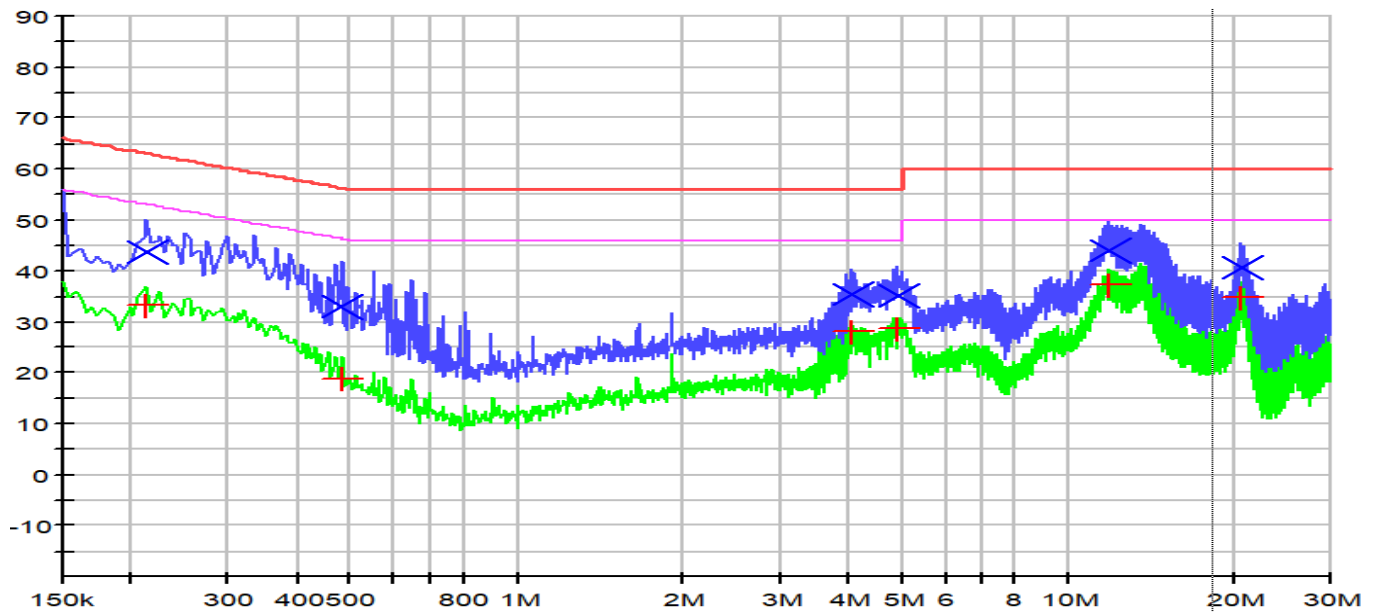
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	AC grid
-------------------------	-----------------	---------

Operating mode / voltage	Mode 7 / Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
--------------------------	--

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/07
Limit: EN IEC 61000-6-3_CE_AC Mains port	Margin: 12,7
Probe: NNLK 8129 (0.009-30MHz)	Polarity: Neutral
EUT: Energy storage systems	Power: Input: 600Vdc, Output: 380 Vac, 50 Hz/614 Vdc
Note: PV 12kW to Grid 6kW + Battery 6kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,214000	43,6	33,4	19,5	63,0	19,6	53,0	9,9	N
2		0,482000	33,0	19,0	23,3	56,3	27,3	46,3	9,9	N
3		4,046000	35,4	28,2	20,6	56,0	17,8	46,0	10,0	N
4		4,922000	35,2	28,6	20,8	56,0	17,4	46,0	10,1	N
5	*	11,854000	44,2	37,3	15,8	60,0	12,7	50,0	10,3	N
6		20,686000	40,7	34,8	19,3	60,0	15,2	50,0	10,6	N

Note:

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--



<b>4.2 Conducted disturbance voltage – DC power port(s)</b>	<b>VERDICT: PASS</b>
---	----------------------

Standard	EN IEC 61000-6-3
Basic standard(s)	EN 55016-2-1

### Limits

Frequency range [MHz]	Limit: QP [dB( $\mu$ V) <sup>1)</sup>	Limit: AV [dB( $\mu$ V) <sup>1)</sup>	IF BW	Detector(s)
0,15 - 0,50	84-74 <sup>3)</sup>	74-64 <sup>3)</sup>	9 kHz	QP, CAV
0,50 - 30	74	64	9 kHz	QP, CAV

<sup>1)</sup> At the transition frequency, the lower limit applies.

<sup>2)</sup> Applicable only to ports intended for connection to a local DC power network, or a local battery by a connecting cable exceeding a length of 30 m.

<sup>3)</sup> The limit decreases linearly with the logarithm of the frequency.

### Performed measurements

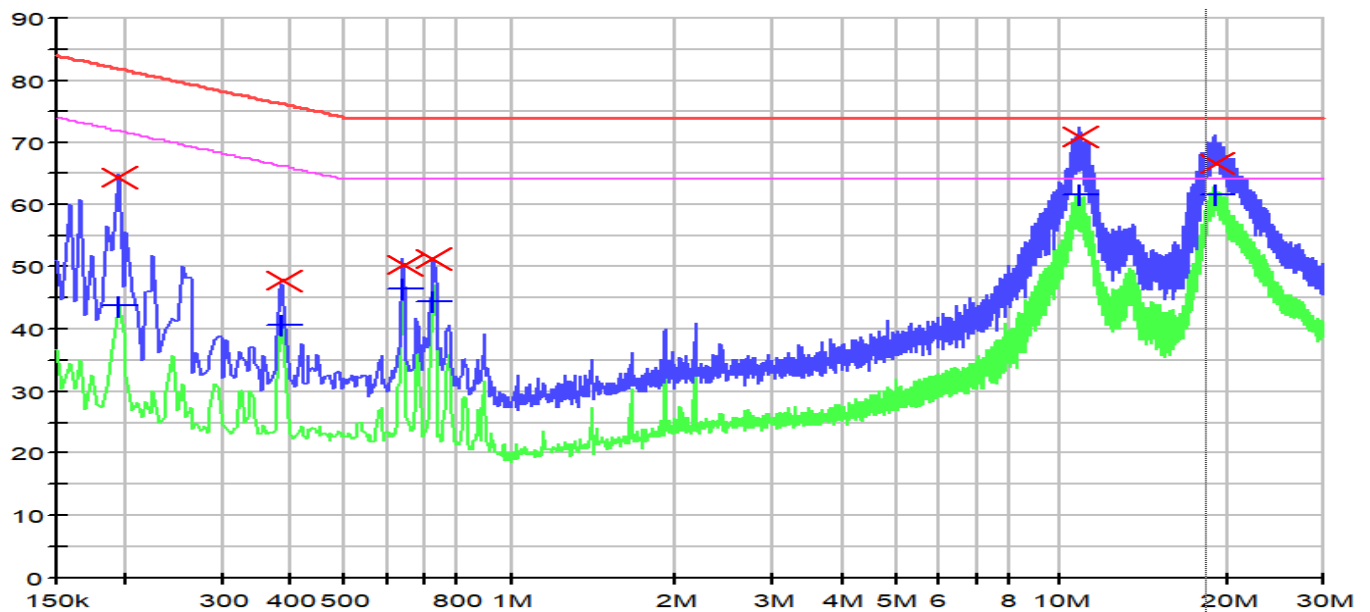
Port under test		Terminal			
<input checked="" type="checkbox"/>	DC power input port	<input checked="" type="checkbox"/>	Positive (+)	<input checked="" type="checkbox"/>	Negative (-)
<input type="checkbox"/>	Other:	<input type="checkbox"/>	Positive (+)	<input type="checkbox"/>	Negative (-)
Voltage – Input [VDC]	600 Vdc/614Vdc				
Voltage – Output [V <sub>DC</sub> ]					
Test method applied	<input checked="" type="checkbox"/>	Artificial mains network			
	<input type="checkbox"/>	Voltage probe			
Test setup	<input type="checkbox"/>	Table top	<input type="checkbox"/>	Artificial hand applied	
	<input checked="" type="checkbox"/>	Floor standing	<input type="checkbox"/>	Other:	
	Refer to the Annex 2 for test setup photo(s).				
Operating mode(s) used	Mode 1, 7				
Remark	---				

See next page.

<b>Measurement data</b>	Port under test	DC power port (Positive)
-------------------------	-----------------	--------------------------

Operating mode / voltage	Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/14
Limit: EN IEC 61000-6-3_CE_DC power port	Margin: 2,4
Probe: PVDC 8300 (0.009-30MHz)	Polarity: Positive
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz
Note: PV 12kW to Grid (High Voltage)	

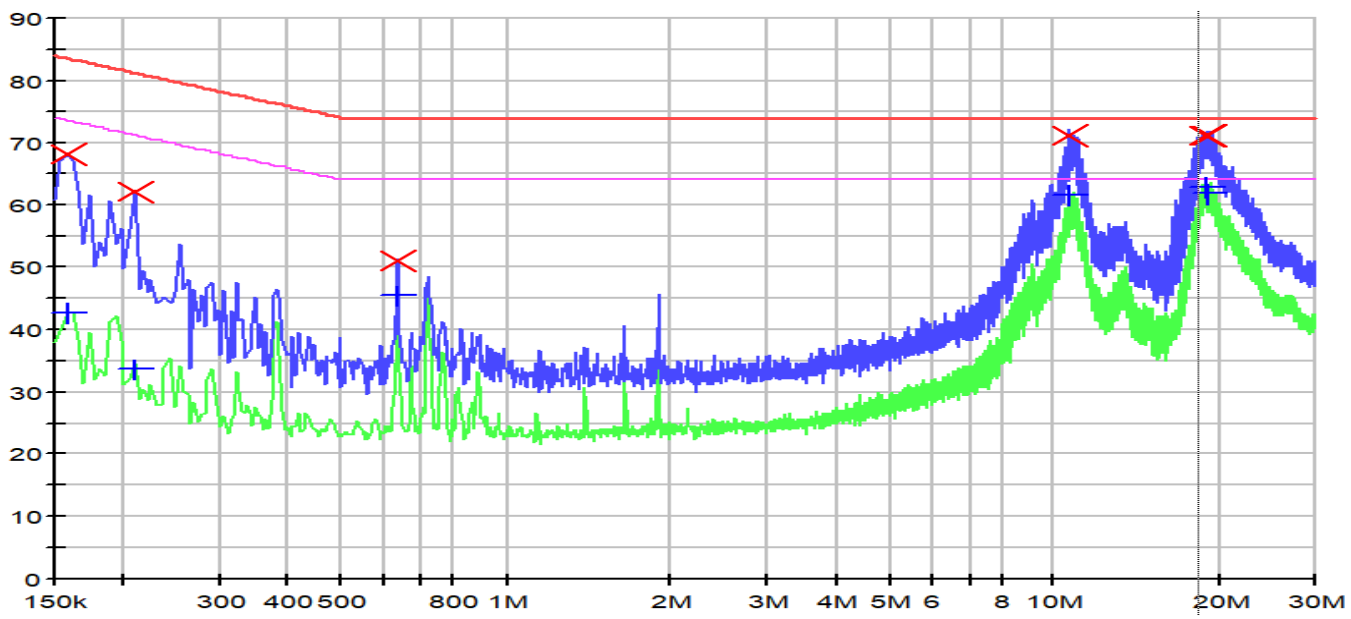


No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,194000	64,5	43,8	17,4	81,9	28,1	71,9	30,4	+
2		0,386000	47,6	40,7	28,5	76,1	25,4	66,1	29,7	+
3		0,638000	50,3	46,6	23,7	74,0	17,4	64,0	29,6	+
4		0,726000	51,4	44,6	22,6	74,0	19,4	64,0	29,6	+
5	*	10,738000	71,0	61,6	3,0	74,0	2,4	64,0	29,8	+
6		19,106000	66,5	61,5	7,5	74,0	2,5	64,0	30,1	+

**Note:**

- " \* ", means this data is the worst emission level.
- Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

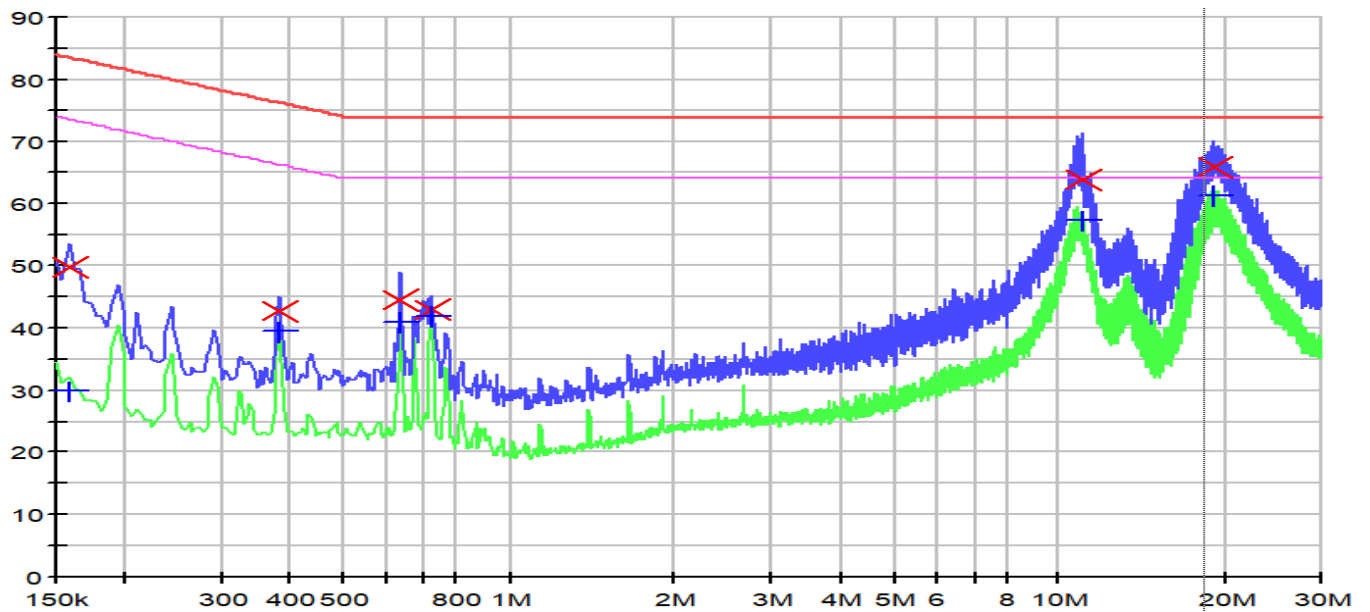
Remark	
--------	--

Measurement data		Port under test	DC power port (Negative)							
Operating mode / voltage		Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz								
Engineer: Vincent Gao										
Site: AC1					Time: 2023/06/14					
Limit: EN IEC 61000-6-3_CE_DC power port					Margin: 1,2					
Probe: PVDC 8300 (0.009-30MHz)					Polarity: Negative					
EUT: Energy storage systems					Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz					
Note: PV 12kW to Grid (High Voltage)										
										
No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,158000	68,0	42,6	15,5	83,6	30,9	73,6	29,8	-
2		0,210000	62,2	33,7	19,0	81,2	37,5	71,2	30,3	-
3		0,634000	51,2	45,5	22,8	74,0	18,5	64,0	29,6	-
4		10,702000	71,1	61,5	2,9	74,0	2,5	64,0	29,8	-
5	*	18,962000	71,2	62,8	2,8	74,0	1,2	64,0	30,0	-
6		19,182000	71,2	61,8	2,8	74,0	2,2	64,0	30,0	-
<p>Note:</p> <p>1. " * ", means this data is the worst emission level.</p> <p>2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).</p>										
Remark										

<b>Measurement data</b>	Port under test	DC power port (Positive)
-------------------------	-----------------	--------------------------

Operating mode / voltage	Mode 7 / Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/14
Limit: EN IEC 61000-6-3_CE_DC power port	Margin: 2,6
Probe: PVDC 8300 (0.009-30MHz)	Polarity: Positive
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc
Note: PV 12kW to Grid 6kW + Battery 6kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,158000	49,7	30,0	33,9	83,6	43,6	73,6	31,1	+
2		0,382000	42,6	39,4	33,6	76,2	26,8	66,2	29,7	+
3		0,634000	44,4	41,0	29,6	74,0	23,0	64,0	29,6	+
4		0,722000	43,0	41,9	31,0	74,0	22,1	64,0	29,3	+
5		10,994000	63,8	57,2	10,2	74,0	6,8	64,0	29,9	+
6	*	19,186000	66,0	61,4	8,0	74,0	2,6	64,0	30,1	+

Note:

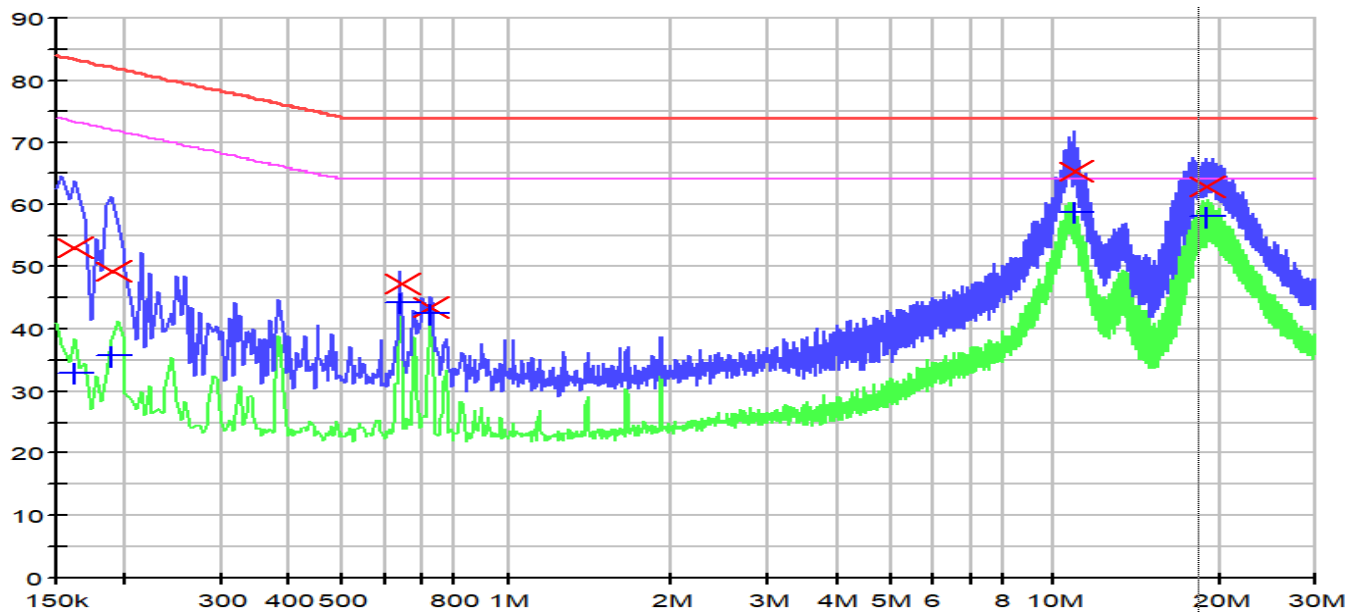
1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>Measurement data</b>	Port under test	DC power port (Negative)
-------------------------	-----------------	--------------------------

Operating mode / voltage	Mode 7 / Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc
--------------------------	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/14
Limit: EN IEC 61000-6-3_CE_DC power port	Margin: 5,2
Probe: PVDC 8300 (0.009-30MHz)	Polarity: Negative
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc
Note: PV 12kW to Grid 6kW + Battery 6kW	



No	Mark	Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Margin - QPK (dB)	Limit - QPK (dBuV)	Margin - CAV (dB)	Limit - CAV (dBuV)	Corr. (dB)	Line
1		0,162000	52,9	33,1	30,4	83,4	40,3	73,4	31,0	-
2		0,190000	49,3	35,8	32,7	82,0	36,2	72,0	30,5	-
3		0,638000	47,3	44,2	26,7	74,0	19,8	64,0	29,6	-
4		0,726000	43,4	42,4	30,6	74,0	21,6	64,0	29,6	-
5	*	10,846000	65,5	58,8	8,5	74,0	5,2	64,0	29,8	-
6		18,974000	62,8	58,0	11,2	74,0	6,0	64,0	30,0	-

**Note:**

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

<b>4.3 Conducted disturbance voltage – Telecommunications network port</b>	<b>VERDICT: N/A</b>
--	---------------------

Standard	EN IEC 61000-6-3
Basic standard(s)	EN 55032, EN 55016-2-1

### Limits

Frequency range [MHz]	Limit: QP [dB( $\mu$ V) <sup>1)</sup>	Limit: AV [dB( $\mu$ V) <sup>1)</sup>	IF BW	Detector(s)
0,15 - 0,50	84 – 74 <sup>2)</sup>	74 – 64 <sup>2)</sup>	9 kHz	QP, CAV
0,50 - 30	74	64	9 kHz	QP, CAV

<sup>1)</sup> At the transition frequency, the lower limit applies.

<sup>2)</sup> The limit decreases linearly with the logarithm of the frequency.

### Performed measurements

Port under test				
<input type="checkbox"/>	LAN / Ethernet	<input type="checkbox"/>	Other:	
<input type="checkbox"/>	Other:	<input type="checkbox"/>	Other:	
Voltage – Mains [V]				
Frequency – Mains [Hz]				
Test method applied	<input type="checkbox"/>	ISN – Impedance Stabilisation Network		
	<input type="checkbox"/>	Voltage probe		
	<input type="checkbox"/>	Current probe		
	<input type="checkbox"/>	Artificial mains network		
	<input type="checkbox"/>	Other:		
Test setup	<input type="checkbox"/>	Table top	<input type="checkbox"/>	Artificial hand applied
	<input type="checkbox"/>	Floor standing	<input type="checkbox"/>	Other:
	Refer to the Annex 2 for test setup photo(s).			
Operating mode(s) used		---		
Remark		---		

See next page.

Measurement data	Port under test	
Operating mode / voltage / frequency used during the test		
<p>The EUT does not contain the wired network port, so it needs not to perform the test item.</p>		
Remark		

<b>4.4 Radiated electromagnetic disturbances (30 – 1000 MHz)</b>	<b>VERDICT: PASS</b>
--	----------------------

Standard	EN IEC 61000-6-3
Basic standard(s)	EN 55016-2-3
Test method	Antenna method according to EN 55016-2-3 standard.
Supplementary information:	

#### Limits

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

<sup>1)</sup> At the transition frequency, the lower limit applies.

#### Performed measurements

Port under test	Enclosure		
Voltage – Mains [V]	Input: 600 Vdc/614 Vdc, Output: 380 Vac, 50 Hz		
Frequency – Mains [Hz]	50 Hz		
Test method applied	<input checked="" type="checkbox"/>	OATS or SAC with measurement distance [m]: 3 m.	
	<input type="checkbox"/>	OATS or SAC with measurement distance [m]: 10 m.	
Test setup	<input type="checkbox"/>	Equipment on a table of 80 cm height	
	<input checked="" type="checkbox"/>	Equipment on the floor (insulated from ground plane)	
	<input type="checkbox"/>	Other:	
Refer to the Annex 2 for test setup photo(s).			
Operating mode(s) used	Mode 1,4,6,7		
Remark	---		

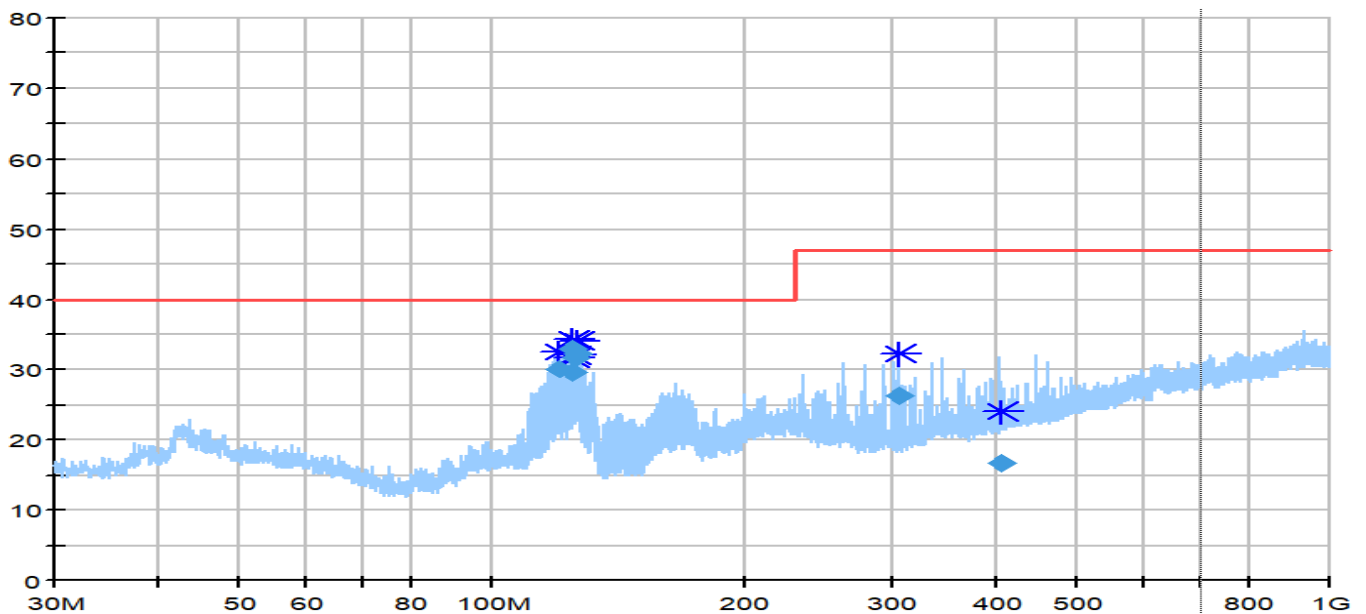
See next page.



Measurement data	<input checked="" type="checkbox"/>	Horizontal	<input type="checkbox"/>	Vertical
------------------	-------------------------------------	------------	--------------------------	----------

Operating mode / voltage / frequency used during the test	Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz
---	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/06/05
Limit: EN IEC 61000-6-3_RE(3m)	Margin: 7,09
Probe: CBL6112D_55543(30-1000MHz)	Polarity: Horizontal
EUT: Energy storage systems	Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz
Note: PV 12kW to Grid (High Voltage)	

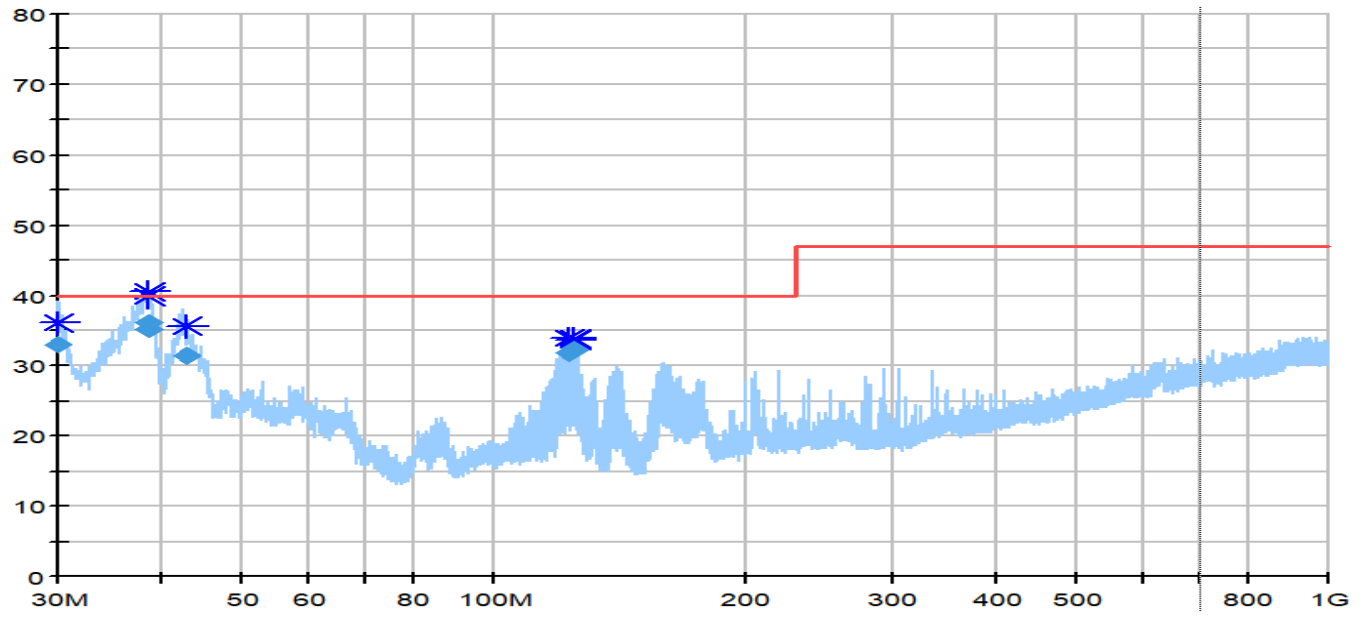


No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1		120,560000	30,19	40,00	9,81	156,0	H	179,0	9,9	QP
2	*	124,600000	32,91	40,00	7,09	136,0	H	186,0	9,3	QP
3		125,120000	29,68	40,00	10,32	295,0	H	3,0	9,3	QP
4		125,720000	31,62	40,00	8,38	265,0	H	25,0	9,2	QP
5		126,280000	32,41	40,00	7,59	268,0	H	347,0	9,1	QP
6		306,840000	26,38	47,00	20,62	242,0	H	194,0	14,4	QP
7		405,520000	16,78	47,00	30,22	124,0	H	222,0	17,0	QP

Note:

- " \* ", means this data is the worst emission level.
- Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

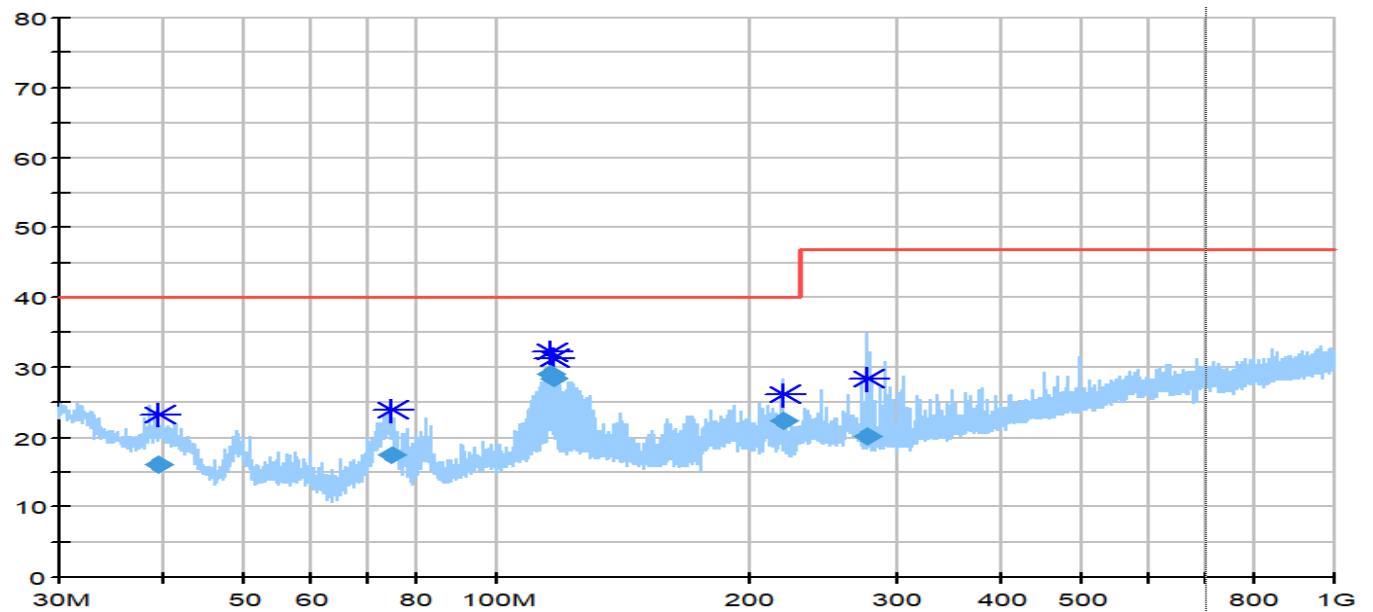
Remark	
--------	--

Measurement data		<input type="checkbox"/>	Horizontal	<input checked="" type="checkbox"/>	Vertical					
Operating mode / voltage / frequency used during the test			Mode 1 / Input: 600 Vdc, Output: 380 Vac, 50 Hz							
Engineer: Vincent Gao										
Site: AC1			Time: 2023/06/05							
Limit: EN IEC 61000-6-3_RE(3m)			Margin: 3,88							
Probe: CBL6112D_55543(30-1000MHz)			Polarity: Vertical							
EUT: Energy storage systems			Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz							
Note: PV 12kW to Grid (High Voltage)										
										
No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1		30,000000	32,87	40,00	7,13	103,0	V	16,0	10,4	QP
2		38,480000	35,16	40,00	4,84	104,0	V	77,0	11,8	QP
3	*	38,600000	36,12	40,00	3,88	124,0	V	112,0	11,9	QP
4		42,880000	31,39	40,00	8,61	106,0	V	124,0	12,8	QP
5		123,240000	31,89	40,00	8,11	128,0	V	299,0	9,5	QP
6		124,440000	32,37	40,00	7,63	100,0	V	305,0	9,3	QP
7		125,000000	32,21	40,00	7,79	111,0	V	248,0	9,3	QP
<p>Note:</p> <ol style="list-style-type: none"> <li>" * ", means this data is the worst emission level.</li> <li>Measurement Level = Reading Level + Factor (Probe+Cable-Amp).</li> </ol>										
Remark										

<b>Measurement data</b>	<input checked="" type="checkbox"/>	<b>Horizontal</b>	<input type="checkbox"/>	<b>Vertical</b>
-------------------------	-------------------------------------	-------------------	--------------------------	-----------------

Operating mode / voltage / frequency used during the test	Mode 4 / Input: 614 Vdc, Output: 380 Vac, 50 Hz
---	---

Engineer: Vincent Gao	
Site: AC1	Time: 2023/05/22
Limit: EN IEC 61000-6-3_RE(3m)	Margin: 10,86
Probe: CBL6112D_55543(30-1000MHz)	Polarity: Horizontal
EUT: Energy storage systems	Power: Input: 614 Vdc, Output: 380 Vac, 50 Hz
Note: Battery 12kW to Gird	

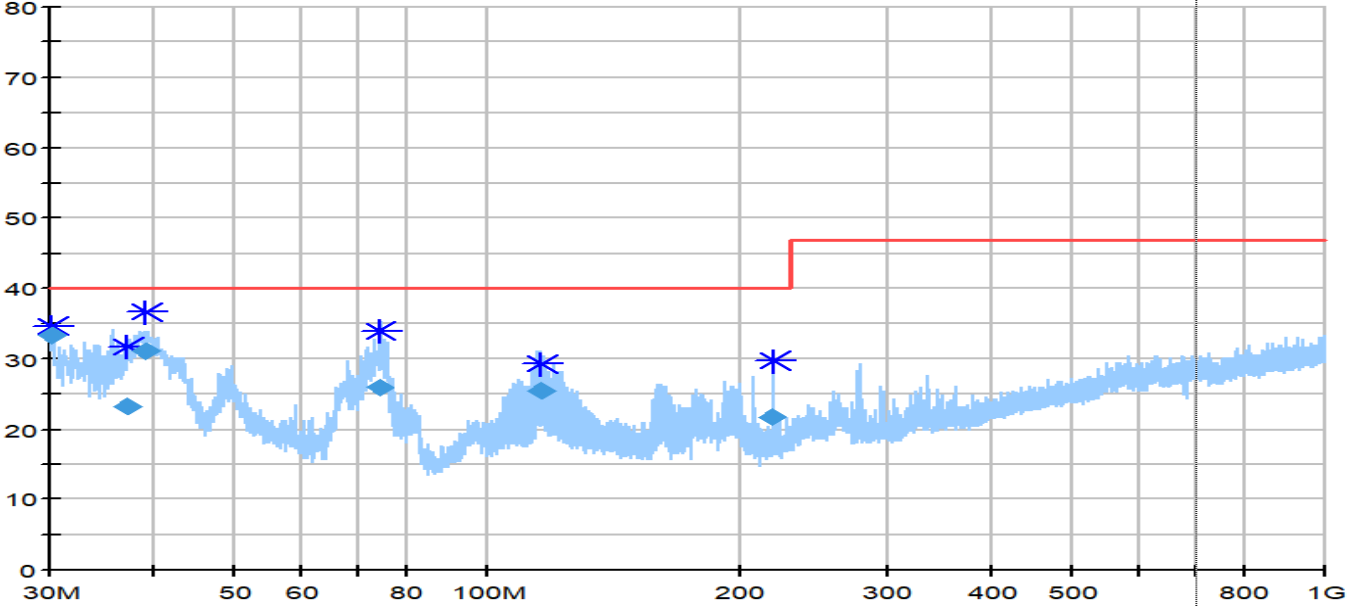


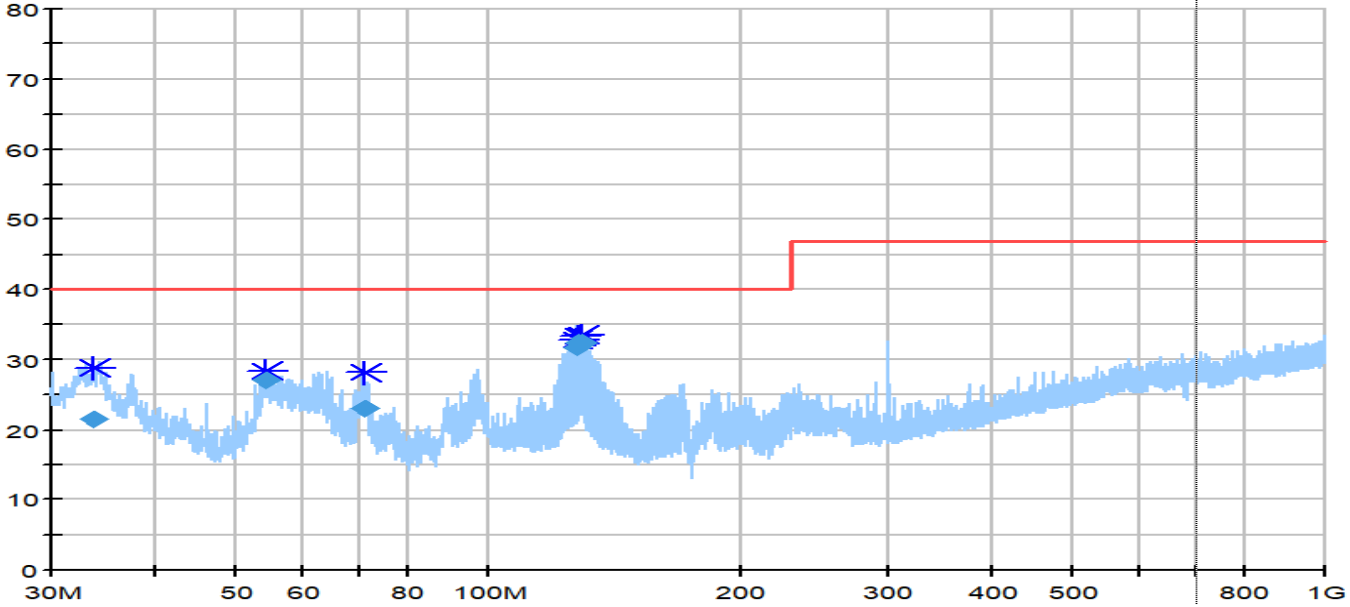
No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1		39,360000	16,10	40,00	23,90	343,0	H	167,0	12,9	QP
2		74,720000	17,44	40,00	22,56	183,0	H	153,0	6,4	QP
3	*	116,000000	29,14	40,00	10,86	161,0	H	222,0	12,5	QP
4		116,600000	28,41	40,00	11,59	150,0	H	243,0	12,5	QP
5		219,960000	22,35	40,00	17,65	207,0	H	79,0	10,0	QP
6		277,400000	20,20	47,00	26,80	123,0	H	81,0	13,7	QP

**Note:**

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

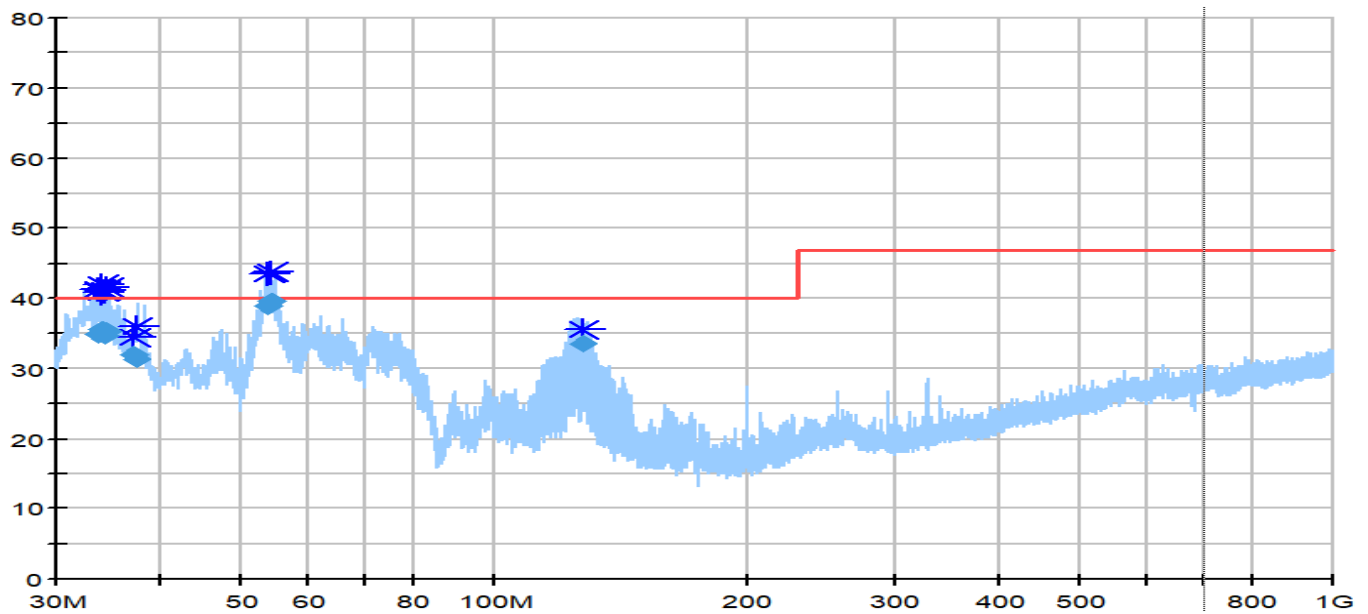
Remark	
--------	--

Measurement data		<input type="checkbox"/>	Horizontal	<input checked="" type="checkbox"/>	Vertical					
Operating mode / voltage / frequency used during the test			Mode 4 / Input: 614 Vdc, Output: 380 Vac, 50 Hz							
Engineer: Vincent Gao										
Site: AC1			Time: 2023/05/22							
Limit: EN IEC 61000-6-3_RE(3m)			Margin: 6,80							
Probe: CBL6112D_55543(30-1000MHz)			Polarity: Vertical							
EUT: Energy storage systems			Power: Input: 614 Vdc, Output: 380 Vac, 50 Hz							
Note: Battery 12kW to Gird										
										
No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1	*	30,240000	33,20	40,00	6,80	131,0	V	83,0	17,4	QP
2		37,160000	23,26	40,00	16,74	150,0	V	271,0	14,1	QP
3		39,200000	30,97	40,00	9,03	111,0	V	95,0	12,9	QP
4		74,600000	25,97	40,00	14,03	206,0	V	90,0	6,4	QP
5		116,000000	25,58	40,00	14,42	118,0	V	174,0	12,5	QP
6		218,760000	21,63	40,00	18,37	150,0	V	211,0	9,9	QP
<p>Note:</p> <ol style="list-style-type: none"> <li>" * ", means this data is the worst emission level.</li> <li>Measurement Level = Reading Level + Factor (Probe+Cable-Amp).</li> </ol>										
Remark										

Measurement data		<input checked="" type="checkbox"/>	Horizontal	<input type="checkbox"/>	Vertical					
Operating mode / voltage / frequency used during the test			Mode 6 / Input: 380 Vac, 50 Hz, Output: 614 Vdc							
Engineer: Vincent Gao										
Site: AC1			Time: 2023/05/17							
Limit: EN IEC 61000-6-3_RE(3m)			Margin: 7,58							
Probe: CBL6112D_55543(30-1000MHz)			Polarity: Horizontal							
EUT: Energy storage systems			Power: Input: 380 Vac, 50 Hz, Output: 614 Vdc							
Note: AC Charge Battery 12kW										
										
No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1		33,840000	21,50	40,00	18,50	350,0	H	14,0	16,0	QP
2		54,160000	26,93	40,00	13,07	112,0	H	176,0	6,9	QP
3		71,200000	22,96	40,00	17,04	275,0	H	0,0	6,1	QP
4		127,360000	31,72	40,00	8,28	350,0	H	111,0	12,4	QP
5		128,440000	32,35	40,00	7,65	327,0	H	193,0	12,3	QP
6	*	129,040000	32,42	40,00	7,58	323,0	H	182,0	12,3	QP
<p>Note:</p> <p>1. " * ", means this data is the worst emission level.</p> <p>2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).</p>										
Remark										

<b>Measurement data</b>	<input type="checkbox"/>	<b>Horizontal</b>	<input checked="" type="checkbox"/>	<b>Vertical</b>
Operating mode / voltage / frequency used during the test		Mode 6 / Input: 380 Vac, 50 Hz, Output: 614 Vdc		

Engineer: Vincent Gao	
Site: AC1	Time: 2023/05/17
Limit: EN IEC 61000-6-3_RE(3m)	Margin: 0,42
Probe: CBL6112D_55543(30-1000MHz)	Polarity: Vertical
EUT: Energy storage systems	Power: Input: 380 Vac, 50 Hz, Output: 614 Vdc
Note: AC Charge Battery 12kW	

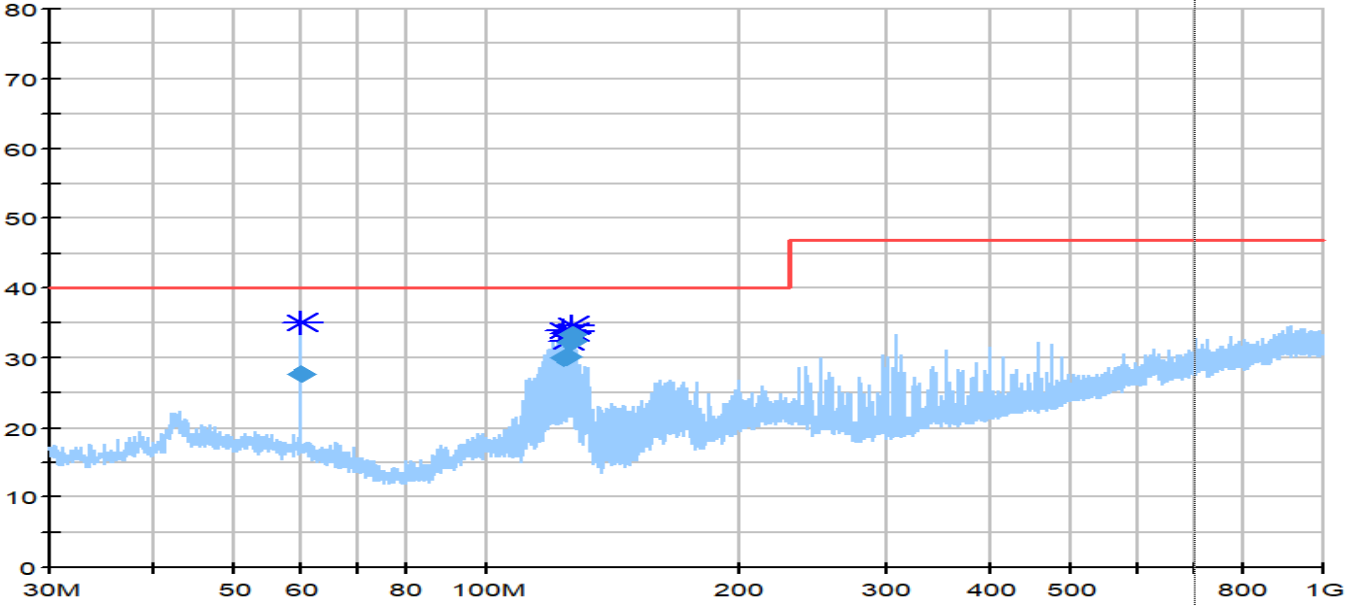


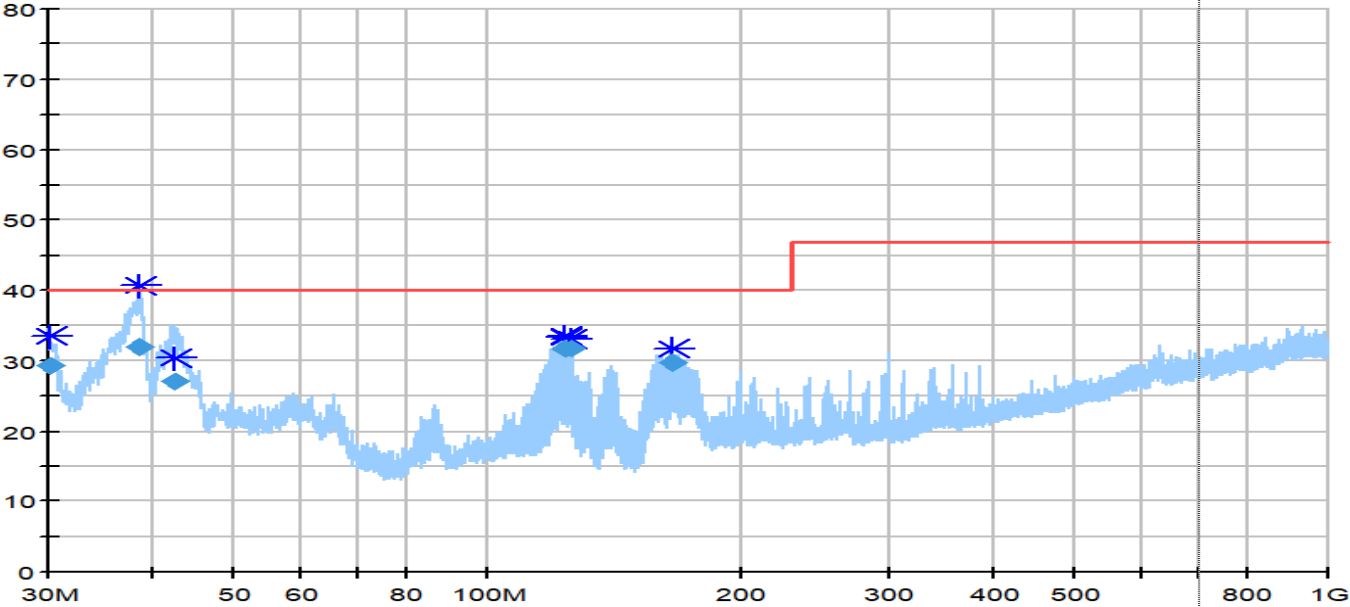
No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1		33,800000	34,88	40,00	5,12	150,0	V	88,0	16,0	QP
2		34,080000	35,52	40,00	4,48	102,0	V	96,0	15,9	QP
3		34,120000	35,03	40,00	4,97	141,0	V	93,0	15,8	QP
4		34,200000	34,66	40,00	5,34	150,0	V	87,0	15,8	QP
5		34,400000	35,39	40,00	4,61	105,0	V	96,0	15,7	QP
6		37,280000	31,96	40,00	8,04	100,0	V	91,0	14,0	QP
7		37,480000	31,37	40,00	8,63	102,0	V	18,0	13,9	QP
8		53,920000	38,86	40,00	1,14	124,0	V	111,0	6,9	QP
9	*	54,160000	39,58	40,00	0,42	103,0	V	116,0	6,9	QP
10		127,800000	33,43	40,00	6,57	100,0	V	118,0	12,3	QP

Note:

1. " \* ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).

Remark	
--------	--

Measurement data		<input checked="" type="checkbox"/>	Horizontal	<input type="checkbox"/>	Vertical					
Operating mode / voltage / frequency used during the test			Mode 7 / Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc							
Engineer: Vincent Gao										
Site: AC1			Time: 2023/06/05							
Limit: EN IEC 61000-6-3_RE(3m)			Margin: 6,62							
Probe: CBL6112D_55543(30-1000MHz)			Polarity: Horizontal							
EUT: Energy storage systems			Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc							
Note: PV 12kW to Grid 6kW + Battery 6kW										
										
No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1		59,920000	27,79	40,00	12,21	350,0	H	346,0	12,5	QP
2		123,480000	29,86	40,00	10,14	150,0	H	181,0	9,5	QP
3		124,680000	30,23	40,00	9,77	128,0	H	189,0	9,3	QP
4		125,800000	32,16	40,00	7,84	278,0	H	19,0	9,2	QP
5	*	126,360000	33,38	40,00	6,62	151,0	H	22,0	9,1	QP
6		126,400000	32,35	40,00	7,65	150,0	H	156,0	9,1	QP
<p>Note:</p> <p>1. " * ", means this data is the worst emission level.</p> <p>2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).</p>										
Remark										

Measurement data		<input type="checkbox"/>	Horizontal	<input checked="" type="checkbox"/>	Vertical					
Operating mode / voltage / frequency used during the test			Mode 7 / Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc							
Engineer: Vincent Gao										
Site: AC1			Time: 2023/06/05							
Limit: EN IEC 61000-6-3_RE(3m)			Margin: 8,07							
Probe: CBL6112D_55543(30-1000MHz)			Polarity: Vertical							
EUT: Energy storage systems			Power: Input: 600 Vdc, Output: 380 Vac, 50 Hz/614 Vdc							
Note: PV 12kW to Grid 6kW + Battery 6kW										
										
No	Mark	Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Type
1		30,200000	29,22	40,00	10,78	112,0	V	87,0	10,3	QP
2	*	38,040000	31,93	40,00	8,07	150,0	V	99,0	11,8	QP
3		42,360000	27,15	40,00	12,85	106,0	V	113,0	12,7	QP
4		124,080000	31,84	40,00	8,16	113,0	V	256,0	9,4	QP
5		124,120000	31,72	40,00	8,28	116,0	V	243,0	9,4	QP
6		125,240000	31,74	40,00	8,26	100,0	V	312,0	9,2	QP
7		166,240000	29,77	40,00	10,23	190,0	V	74,0	9,2	QP
<p>Note:</p> <p>1. " * ", means this data is the worst emission level.</p> <p>2. Measurement Level = Reading Level + Factor (Probe+Cable-Amp).</p>										
Remark										



<b>4.5</b>	<b>Radiated electromagnetic disturbances (above 1 GHz)</b>	<b>VERDICT:</b>	<b>N/A</b>
------------	--	-----------------	------------

Standard	EN IEC 61000-6-3		
Basic standard(s)	EN 55016-2-3		
Test method	Antenna method according to EN 55016-2-3 standard.		
Required highest frequency for radiated measurement			
	Highest internal frequency [f <sub>x</sub> ]	Highest measured frequency	
<input checked="" type="checkbox"/>	f <sub>x</sub> ≤ 108 MHz	1 GHz	
<input type="checkbox"/>	108 MHz < f <sub>x</sub> ≤ 500 MHz	2 GHz	
<input type="checkbox"/>	500 MHz < f <sub>x</sub> ≤ 1 GHz	5 GHz	
<input type="checkbox"/>	f <sub>x</sub> ≥ 1 GHz	5x f <sub>x</sub> or up to 6 GHz	

### Limits

Frequency [GHz]	Limit: PK@3m.[dB(μV/m) <sup>1)</sup>	Limit: AV@3m.[dB(μV/m) <sup>1)</sup>	IF BW	Detector
1 - 3	70	50	1 MHz	PK, CAV
3 - 6	74	54	1 MHz	PK, CAV

<sup>1)</sup> At the transition frequency, the lower limit applies.

### Performed measurements

Port under test	Enclosure		
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 2 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				
<p>The highest internal frequency[f<sub>x</sub>] of EUT ≤ 108 MHz, so it needs not to perform the test item.</p>				
Remark				

4.6 Discontinuous disturbance (clicks) on AC power leads	VERDICT: N/A
--	--------------

Standard	EN 55014-1		
Frequency [MHz]	Limit: QP [dB(μV)]	IF BW	Detector
0,15	66	9 KHz	QP
0,50	56	9 KHz	QP
1,40	56	9 KHz	QP
30,0	60	9 KHz	QP

#### Performed measurements

Scan range (0,9 - 1,1 $U_N$ )	<input type="checkbox"/>	198 – 264 V <sub>AC</sub>	<input type="checkbox"/>	207 – 253 V <sub>AC</sub>	<input type="checkbox"/>	V <sub>AC</sub>
Voltage – Mains [V]						
Frequency – Mains [Hz]						
Test method applied	<input type="checkbox"/>	Artificial mains network				
	<input type="checkbox"/>	Voltage probe				
Test setup	<input type="checkbox"/>	Table top	<input type="checkbox"/>	Floor standing		
	<input type="checkbox"/>	Other:				
	Refer to the Annex 2 for test setup photo(s).					
Operating mode(s) used	Exemptions from click measurements applicable (clause 4.2.3).					
Remark	---					

Reason for not performing the test	<input type="checkbox"/>	The amplitudes of the observed disturbances were all below the limit for continuous disturbance, these are not considered to be clicks.						
Measurement results	<input type="checkbox"/>	Neutral	<input type="checkbox"/>	Line 1	<input type="checkbox"/>	Line 2	<input type="checkbox"/>	Line 3
Frequency (MHz)	First Measurement: Determination of the limit $L_q$ – Quasi-peak							
	Limit $L$ (dBμV)	Number of short clicks	Number of long clicks	Number of clicks – $N_1$	Time of meas. (min.)	Click rate $N$	Increased limit (dB)	Increased Limit $L_q$
0,15	66							
0,5	56							
1,4	56							
30	60							
<input type="checkbox"/>	The calculated click rate $N$ is not more than 5 times per minute and all the clicks are classified as short ( $t \leq 10$ ms). Thus, the EUT is deemed to comply with the limits without any further measurement at an increased limit.							
Frequency (MHz)	Second measurement with Limit = $L_q$ (Upper quartile method):							
	Limit $L_q$ (dBμV)	Number of clicks – $N_2$	Number of authorized clicks $N_2 \leq N_1/4$		Verdict			
0,15								
0,5								
1,4								
30								
Supplementary information:								

<b>4.7 Harmonic current emissions</b>	<b>VERDICT: PASS</b>
---------------------------------------	----------------------

Standard	EN IEC 61000-6-3	
Basic standard	EN IEC 61000-3-2 & EN 61000-3-12	
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 <sub>AC</sub> (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 ( $I_{input} \leq 16 \text{ A}$ )		
<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 ( $16 \text{ A} \leq I_{input} < 75 \text{ A}$ )		
<input checked="" type="checkbox"/>	Table 2	other than balanced three-phase equipment
<input type="checkbox"/>	Table 3	balanced three-phase equipment
<input type="checkbox"/>	Table 4	balanced three-phase equipment under specified conditions
<input type="checkbox"/>	Table 5	balanced three-phase equipment under specified conditions

#### Performed measurements

Port under test	AC grid					
Voltage – Mains [V]	380 Vac					
Frequency – Mains [Hz]	50 Hz					
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 6.2 (EN / IEC 61000-3-2).				
	<input checked="" type="checkbox"/>	Comply with the requirements of the Clause 5.1 (EN / IEC 61000-3-12).				
	<input type="checkbox"/>	Not comply with the requirements of the Clause 6.2 (EN / IEC 61000-3-2).				
	<input type="checkbox"/>	Not comply with the requirements of the Clause 5.1 (EN / IEC 61000-3-12).				
Operating mode(s) used	Mode 6					
Remark	---					



Measurement data		Port under test	AC input power- Line 2	
Operating mode / voltage / frequency used during the test		Mode 6: AC supply to Battery Input: 380 Vac, 50 Hz		
<p><b>Test Result: Pass</b>                      <b>Source qualification: Pass</b>  <b>Product Classification: Class A; Test voltage: AC 220.44V; 50 Hz</b>  <b>Fundamental current I1: 14.871A; Power factor: 0.994; Active input power: 3.276KW.</b>  <b>THC/I<sub>ref</sub>(%): &lt; 13.0 Limit(%): 13.0 PWHC/I<sub>ref</sub>(%): &lt; 23.0 PWHC Limit(%):23.0</b></p>				
Harm#	I <sub>eff</sub> [A]	I <sub>eff</sub> [%]	Limit [%]	Result
2	421.575E-3	2.835	8.00	PASS
3	552.405E-3	3.715	N/A	PASS
4	354.446E-3	2.383	4.00	PASS
5	642.285E-3	4.319	10.7	PASS
6	215.062E-3	1.446	2.67	PASS
7	374.166E-3	2.516	7.2	PASS
8	102.501E-3	0.689	2.00	PASS
9	56.023E-3	0.377	N/A	PASS
10	94.441E-3	0.635	1.60	PASS
11	222.456E-3	1.496	3.1	PASS
12	58.222E-3	0.392	1.33	PASS
13	260.678E-3	1.753	2.0	PASS
14	69.540E-3	0.468	N/A	PASS
15	56.609E-3	0.381	N/A	PASS
16	40.463E-3	0.272	N/A	PASS
17	172.519E-3	1.160	N/A	PASS
18	56.437E-3	0.380	N/A	PASS
19	217.318E-3	1.461	N/A	PASS
20	59.969E-3	0.403	N/A	PASS
21	50.982E-3	0.343	N/A	PASS
22	91.200E-3	0.613	N/A	PASS
23	73.999E-3	0.498	N/A	PASS
24	123.493E-3	0.830	N/A	PASS
25	87.742E-3	0.590	N/A	PASS
26	95.434E-3	0.642	N/A	PASS
27	78.102E-3	0.525	N/A	PASS
28	86.787E-3	0.584	N/A	PASS
29	133.084E-3	0.895	N/A	PASS
30	73.385E-3	0.493	N/A	PASS
31	91.546E-3	0.616	N/A	PASS
32	70.566E-3	0.475	N/A	PASS
33	57.078E-3	0.384	N/A	PASS
34	54.075E-3	0.364	N/A	PASS
35	49.076E-3	0.330	N/A	PASS
36	44.153E-3	0.297	N/A	PASS
37	50.360E-3	0.339	N/A	PASS
38	32.119E-3	0.216	N/A	PASS
39	27.924E-3	0.188	N/A	PASS
40	27.305E-3	0.184	N/A	PASS
<p>1. Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.  2. According to EN61000-3-2 paragraph 7 the note 1 and 2 are valid for all applications having an active input power &gt;75W. Others the result should be pass.</p>				
Remark				

Measurement data		Port under test	AC input power- Line 3	
Operating mode / voltage / frequency used during the test		Mode 6: AC supply to Battery Input: 380 Vac, 50 Hz		
<p><b>Test Result: Pass</b>                      <b>Source qualification: Pass</b>  <b>Product Classification: Class A; Test voltage: AC 219.85V; 50 Hz</b>  <b>Fundamental current I1: 16.238A; Power factor: 0.994; Active input power: 3.568KW.</b>  <b>THC/I<sub>ref</sub>(%): &lt; 13.0 Limit(%):13.0 PWHC/I<sub>ref</sub>(%): &lt; 23.0 PWHC Limit(%):23.0</b></p>				
Harm#	I <sub>eff</sub> [A]	I <sub>eff</sub> [%]	Limit [%]	Result
1	16.238	100.000	8.00	PASS
2	808.869E-3	4.981	N/A	PASS
3	264.641E-3	1.630	4.00	PASS
4	241.529E-3	1.487	10.7	PASS
5	764.470E-3	4.708	2.67	PASS
6	99.243E-3	0.611	7.2	PASS
7	330.594E-3	2.036	2.00	PASS
8	173.634E-3	1.069	N/A	PASS
9	57.869E-3	0.356	1.60	PASS
10	26.222E-3	0.161	3.1	PASS
11	170.068E-3	1.047	1.33	PASS
12	37.163E-3	0.229	2.0	PASS
13	308.421E-3	1.899	N/A	PASS
14	56.268E-3	0.347	N/A	PASS
15	27.649E-3	0.170	N/A	PASS
16	32.746E-3	0.202	N/A	PASS
17	142.892E-3	0.880	N/A	PASS
18	33.756E-3	0.208	N/A	PASS
19	186.871E-3	1.151	N/A	PASS
20	46.866E-3	0.289	N/A	PASS
21	29.262E-3	0.180	N/A	PASS
22	92.032E-3	0.567	N/A	PASS
23	80.726E-3	0.497	N/A	PASS
24	52.106E-3	0.321	N/A	PASS
25	54.356E-3	0.335	N/A	PASS
26	44.537E-3	0.274	N/A	PASS
27	44.822E-3	0.276	N/A	PASS
28	55.653E-3	0.343	N/A	PASS
29	128.544E-3	0.792	N/A	PASS
30	47.125E-3	0.290	N/A	PASS
31	53.197E-3	0.328	N/A	PASS
32	38.228E-3	0.235	N/A	PASS
33	42.123E-3	0.259	N/A	PASS
34	52.601E-3	0.324	N/A	PASS
35	66.921E-3	0.412	N/A	PASS
36	29.233E-3	0.180	N/A	PASS
37	38.539E-3	0.237	N/A	PASS
38	23.626E-3	0.145	N/A	PASS
39	20.669E-3	0.127	N/A	PASS
<p>1. Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.  2. According to EN61000-3-2 paragraph 7 the note 1 and 2 are valid for all applications having an active input power &gt;75W. Others the result should be pass.</p>				
Remark				

<b>4.8 Voltage changes, voltage fluctuations and flicker</b>	<b>VERDICT: PASS</b>
--	----------------------

Standard	EN IEC 61000-6-3
Basic standard	EN 61000-3-3 & EN IEC 61000-3-11

#### Limits

$P_{ST}$ (Short term flicker)	<input checked="" type="checkbox"/>	$\leq 1$	<input type="checkbox"/>	Not Applicable
$P_{LT}$ (Long term flicker)	<input checked="" type="checkbox"/>	$\leq 0,65$	<input type="checkbox"/>	Not Applicable
$d_c$ (Relative Voltage change)	<input checked="" type="checkbox"/>	$\leq 3,3\%$	<input type="checkbox"/>	Not Applicable
$T_{max}$ (Maximum time duration)	<input checked="" type="checkbox"/>	$\leq 500ms$	<input type="checkbox"/>	Not Applicable
$d_{MAX}$ (Max. voltage change)	<input checked="" type="checkbox"/>	$\leq 4\%$	<input type="checkbox"/>	6%
	<input type="checkbox"/>	7%	<input type="checkbox"/>	Not Applicable
Supplemental information:				

#### 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 grid					
Voltage – Mains [V]	380 Vac					
Frequency – Mains [Hz]	50 Hz					
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 type="checkbox"/>	10 min.	<input checked="" type="checkbox"/>	120 min.	<input type="checkbox"/>	Other:
	<input type="checkbox"/>	24 times switching according to Annex B				
Operating mode(s) used	Mode 6					
Remark	---					

See next page.



<b>Measurement data</b>	Port under test	AC input power – Line 1																										
Operating mode used during the test	Mode 6: AC supply to Battery Input: 380 Vac, 50 Hz, Output: 614 Vdc																											
<p data-bbox="164 398 391 427"><b>Test Result: Pass</b></p> <p data-bbox="1054 398 1339 427"><b>Status: Test Complete</b></p> <p data-bbox="164 510 715 539"><b>Parameter values recorded during the test:</b></p> <table data-bbox="164 539 1267 678"> <tr> <td>T-max (mS):</td> <td>0.0</td> <td>Test limit (mS):</td> <td>500.0</td> <td>Pass</td> </tr> <tr> <td>Highest dc (%):</td> <td>0.007</td> <td>Test limit (%):</td> <td>3.30</td> <td>Pass</td> </tr> <tr> <td>Highest dmax (%):</td> <td>0.375</td> <td>Test limit (%):</td> <td>4.00</td> <td>Pass</td> </tr> <tr> <td>Highest Pst (10 min. period):</td> <td>0.039</td> <td>Test limit:</td> <td>1.000</td> <td>Pass</td> </tr> <tr> <td>Highest Plt (2 hr. period):</td> <td>0.036</td> <td>Test limit:</td> <td>0.650</td> <td>Pass</td> </tr> </table>				T-max (mS):	0.0	Test limit (mS):	500.0	Pass	Highest dc (%):	0.007	Test limit (%):	3.30	Pass	Highest dmax (%):	0.375	Test limit (%):	4.00	Pass	Highest Pst (10 min. period):	0.039	Test limit:	1.000	Pass	Highest Plt (2 hr. period):	0.036	Test limit:	0.650	Pass
T-max (mS):	0.0	Test limit (mS):	500.0	Pass																								
Highest dc (%):	0.007	Test limit (%):	3.30	Pass																								
Highest dmax (%):	0.375	Test limit (%):	4.00	Pass																								
Highest Pst (10 min. period):	0.039	Test limit:	1.000	Pass																								
Highest Plt (2 hr. period):	0.036	Test limit:	0.650	Pass																								
Remark	The product meets the technical requirements of EN 61000-3-3																											

<b>Measurement data</b>	Port under test	AC input power – Line 2																										
Operating mode used during the test	Mode 6: AC supply to Battery Input: 380 Vac, 50 Hz, Output: 614 Vdc																											
<p data-bbox="164 398 391 427"><b>Test Result: Pass</b></p> <p data-bbox="1054 398 1339 427"><b>Status: Test Complete</b></p> <p data-bbox="164 510 715 539"><b>Parameter values recorded during the test:</b></p> <table data-bbox="164 539 1267 678"> <tr> <td>T-max (mS):</td> <td>0.0</td> <td>Test limit (mS):</td> <td>500.0</td> <td>Pass</td> </tr> <tr> <td>Highest dc (%):</td> <td>0.007</td> <td>Test limit (%):</td> <td>3.30</td> <td>Pass</td> </tr> <tr> <td>Highest dmax (%):</td> <td>0.367</td> <td>Test limit (%):</td> <td>4.00</td> <td>Pass</td> </tr> <tr> <td>Highest Pst (10 min. period):</td> <td>0.063</td> <td>Test limit:</td> <td>1.000</td> <td>Pass</td> </tr> <tr> <td>Highest Plt (2 hr. period):</td> <td>0.052</td> <td>Test limit:</td> <td>0.650</td> <td>Pass</td> </tr> </table>				T-max (mS):	0.0	Test limit (mS):	500.0	Pass	Highest dc (%):	0.007	Test limit (%):	3.30	Pass	Highest dmax (%):	0.367	Test limit (%):	4.00	Pass	Highest Pst (10 min. period):	0.063	Test limit:	1.000	Pass	Highest Plt (2 hr. period):	0.052	Test limit:	0.650	Pass
T-max (mS):	0.0	Test limit (mS):	500.0	Pass																								
Highest dc (%):	0.007	Test limit (%):	3.30	Pass																								
Highest dmax (%):	0.367	Test limit (%):	4.00	Pass																								
Highest Pst (10 min. period):	0.063	Test limit:	1.000	Pass																								
Highest Plt (2 hr. period):	0.052	Test limit:	0.650	Pass																								
Remark	The product meets the technical requirements of EN 61000-3-3																											

<b>Measurement data</b>	Port under test	AC input power – Line 3	
Operating mode used during the test	Mode 6: AC supply to Battery Input: 380 Vac, 50 Hz, Output: 614 Vdc		
<b>Test Result: Pass</b>		<b>Status: Test Complete</b>	
<b>Parameter values recorded during the test:</b>			
T-max (mS):	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.014	Test limit (%):	3.30 Pass
Highest dmax (%):	0.562	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.119	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.117	Test limit:	0.650 Pass
Remark	The product meets the technical requirements of EN 61000-3-3		

## 5 IMMUNITY TEST RESULTS

### 5.1 Performance (Compliance) criteria

[Source: EN IEC 61000-6-1]

Performance criterion A: The EUT shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion B: The EUT shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Performance criterion C: Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.

#### 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 : Output Voltage
<input type="checkbox"/>	AC mains input current	<input checked="" type="checkbox"/>	Others : Screen
<input type="checkbox"/>	Timing	<input checked="" type="checkbox"/>	Others : Output 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	Camera
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>		

<b>5.3 Electrostatic discharge immunity</b>	<b>VERDICT: PASS</b>
---	----------------------

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	EN IEC 61000-6-1							
Basic standard	EN 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 type="checkbox"/>	Table-top	<input checked="" type="checkbox"/>	Floor standing
Ambient temperature [°C]	24°C		Relative Humidity air [%]	59%
Voltage – Mains [V]	Input: 600 Vdc/614 Vdc, Output: 380 Vac, 50 Hz			
Frequency – Mains [Hz]	50 Hz			
Operating mode(s) used	Mode 6,7			

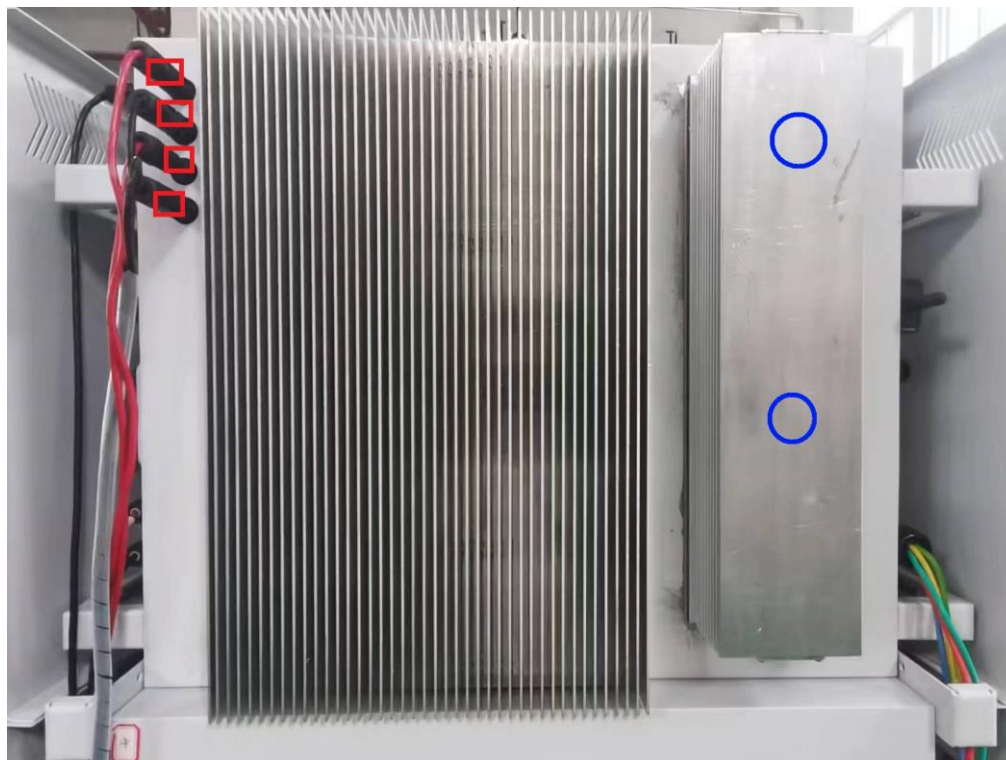
Test Point (Location of discharge, see also photo)	Test Voltage [kV] & Polarity	Coupling type	# of applied discharges / polarity	Discharge interval [s]
<input checked="" type="checkbox"/> Points on conductive surface as indicated in the picture below.	±4	Contact	10	1
<input checked="" type="checkbox"/> Points on non-conductive surface as indicated in the picture below.	±2 / ±4 / ±8	Air	10	1
<input type="checkbox"/> HCP top side.	±4	Contact	10	1
<input 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:				

Photo of selected test points

Test Dot:



Test Dot:



Supplementary information:

Red: Air Discharge, Blue: Contact Discharge

Photo of selected test points

Test Dot:



Test Dot:



Supplementary information:

**Red: Air Discharge, Blue: Contact Discharge**



<b>5.4</b>	<b>Radio-frequency electromagnetic fields immunity</b>	<b>VERDICT: PASS</b>
------------	--	----------------------

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	EN IEC 61000-6-1			
Basic standard	EN 61000-4-3			
Port under test	Enclosure			
Frequency range	Test level	Modulation	Dwell time	Step size
80 – 1000 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
1400 – 6000 MHz	3 V/m	80% AM (1kHz)	≥ 0,5 s	≤ 1%
<u>Supplementary information:</u>				

#### Performed tests

Test method	<input checked="" type="checkbox"/>	IEC 61000-4-3				
Test set-up	<input type="checkbox"/>	Equipment on the table (0,8 m height)				
(see annex 2 for photo)	<input checked="" type="checkbox"/>	Equipment standing on floor (0,05 – 0,15 m height)				
Voltage – Mains [V]	Input: 600 Vdc/614 Vdc, Output: 380 Vac, 50 Hz		Frequency – Mains [Hz]	50 Hz		
Operating mode(s) used	Mode 6,7					
Frequency range (applied)	Antenna Polarization	Test level (applied)	Modulation (applied)	Dwell time (applied)	Remark	
80 – 1000 MHz (step size 1%)	H	3 V/m	80% AM (1kHz)	3 s	---	
	V	3 V/m	80% AM (1kHz)	3 s	---	
1400 – 6000 MHz (step size 1%)	H	3 V/m	80% AM (1kHz)	3 s	---	
	V	3 V/m	80% AM (1kHz)	3 s	---	
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>						

<b>5.5</b>	<b>Electrical Fast Transients immunity</b>	<b>VERDICT: PASS</b>
------------	--	----------------------

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	EN IEC 61000-6-1		
Basic standard	EN 61000-4-4		
Pulse characteristics	5/50 ns		
Port	Test level	Repetition frequency	Duration
AC input-output power	± 1000 V	5 kHz	≥1 min. / polarity
DC input-output power <sup>2)</sup>	± 500 V	5 kHz	≥1 min. / polarity
Signal ports <sup>1)</sup>	± 500 V	5 kHz	≥1 min. / polarity
<sup>1)</sup> Only applicable to ports interfacing with cables whose total length may exceed 3 m. <sup>2)</sup> 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.			

### Performed tests

Voltage – Mains [V]	Input: 600 Vdc/614 Vdc, Output: 380 Vac, 50 Hz		
Frequency – Mains [Hz]	50 Hz		
Operating mode(s) used	Mode 6,7		
Test Set-up (see annex 2 for photo)	<input checked="" type="checkbox"/>	Equipment standing on floor at (0,1 ± 0,01) m above ground plane	
	<input type="checkbox"/>	Equipment on the table (0,1 ± 0,01) m above ground plane	
	<input type="checkbox"/>	Artificial hand applied. Location refer to chapter 8.	
Coupling	<input checked="" type="checkbox"/>	Common mode	<input type="checkbox"/> Other:

Port under test	Test Voltage & Polarity	Repetition Frequency	Test duration / polarity	Injection method		
DC input port	± 0.5 kV	5 kHz	60 s	<input checked="" type="checkbox"/>	CDN	<input type="checkbox"/> Clamp
AC grid port	± 1 kV	5 kHz	60 s	<input checked="" type="checkbox"/>	CDN	<input 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.					
Supplementary information:						

<b>5.6</b>	<b>Surge transient immunity</b>	<b>VERDICT: PASS</b>
------------	---------------------------------	----------------------

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	EN IEC 61000-6-1		
Basic standard	EN 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)		
Port	Test level & Polarity & Coupling		Phase angle [°]
	Line to Line <sup>1)</sup>	Line to Earth <sup>1)</sup>	
AC input-output power	± 1 kV	± 2 kV	0, 90, 180, 270
DC input-output power <sup>2)</sup>	± 0,5 kV	± 1 kV	---
<sup>1)</sup> In addition to the specified test level, all lower test levels as detailed in EN 61000-4-5 should also be satisfied. <sup>2)</sup> 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. DC ports, which are not intended to be connected to a DC distribution network are treated as signal ports.			

#### Performed tests

Voltage – Mains [V]	Input: 600 Vdc/614 Vdc, Output: 380 Vac, 50 Hz
Frequency – Mains [Hz]	50 Hz
Operating mode(s) used	Mode 6,7
Repetition rate	60 secs. (for each test level and phase angle)
Number of pulses	5 pulses (at each polarity and phase angle)

Port under test	Coupling	Test level & Polarity	Phase angle [°]	Remark
<input checked="" type="checkbox"/> DC input port	Line to Line	± 0,5 kV	---	---
<input checked="" type="checkbox"/> DC input port	Line to Earth	± 1 kV	---	---
<input checked="" type="checkbox"/> AC grid port	Line to Line	± 1 kV	0, 90, 180, 270	---
<input checked="" type="checkbox"/> AC grid port	Line to Earth	± 2 kV	0, 90, 180, 270	---
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>				

<b>5.7</b>	<b>Injected currents (RF common mode) immunity</b>	<b>VERDICT: PASS</b>
------------	--	----------------------

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	EN IEC 61000-6-1				
Basic standard	EN 61000-4-6				
Frequency range	0,15 – 80 MHz				
Port	Test level, $U_0$	Modulation	Step size	Dwell time	
AC input-output power	3 V	80% AM (1kHz)	$\leq 1\%$	$\geq 0,5$ s	
DC input-output power <sup>1)</sup>	3 V	80% AM (1kHz)	$\leq 1\%$	$\geq 0,5$ s	
Signal port <sup>1)</sup>	3 V	80% AM (1kHz)	$\leq 1\%$	$\geq 0,5$ s	
<sup>1)</sup> Only applicable to ports interfacing with cables whose total length, may exceed 3 m.					

#### 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]	Input: 600 Vdc/614 Vdc, Output: 380 Vac, 50 Hz	Frequency – Mains [Hz]	50 Hz		
Operating mode(s) used	Mode 6,7				
Test set-up (see annex 2 for photo)	<input checked="" type="checkbox"/>	Equipment standing on floor at $(0,1 \pm 0,01)$ m above ground plane.			
	<input type="checkbox"/>	Equipment on the table $(0,1 \pm 0,01)$ m above ground plane.			
	<input type="checkbox"/>	Artificial hand applied. Location refer to Annex 2.			
Port under test	Test Level (applied)	Injection method	Dwell time (applied)	Remark	
DC input port	3 V	Clamp	3 s	---	
AC power port	3 V	CDN	3 s	---	
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:					

<b>5.8</b>	<b>Power frequency magnetic field immunity</b>	<b>VERDICT: PASS</b>
------------	--	----------------------

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	EN IEC 61000-6-1
Basic standard	IEC 61000-4-8
Port under test	Enclosure
Field strength	3 A/m
Test Frequency	50 / 60 Hz
Notes: Applicable only to apparatus containing devices susceptible to magnetic fields.	

### 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]	Input: 600 Vdc/614 Vdc, Output: 380 Vac, 50 Hz	
Frequency – Mains [Hz]	50 Hz	
Operating mode(s) used	Mode 6,7	
Test set-up (see annex 2 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	Remark
<input checked="" type="checkbox"/>	X-axis	3 A/m	50, 60 Hz	60 s	---
<input checked="" type="checkbox"/>	Y-axis	3 A/m	50, 60 Hz	60 s	---
<input checked="" type="checkbox"/>	Z-axis	3 A/m	50, 60 Hz	60 s	---
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>					

<b>5.9</b>	<b>Power supply interruptions and dips immunity</b>	<b>VERDICT: PASS</b>
------------	---	----------------------

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	EN IEC 61000-6-1			
Basic standard	EN IEC 61000-4-11			
# of dips & interruptions	3 dips / interruptions for each test level and phase angle			
Interval between events	≥ 10 seconds			
Port under test	Test level <sup>1)</sup>	Period (Cycles)		Performance Criterion
		50 Hz	60 Hz	
AC input power port	U <sub>NOM</sub> –100%	0.5	0.5	B; Refer to the chapter 5.1 for details.
AC input power port	U <sub>NOM</sub> – 100%	1	1	B; Refer to the chapter 5.1 for details.
AC input power port	U <sub>NOM</sub> – 30%	25	30	C; Refer to the chapter 5.1 for details.
AC input power port	U <sub>NOM</sub> –100%	250	300	C; Refer to the chapter 5.1 for details.
<sup>1)</sup> Changes to the voltage level shall occur at a zero crossing point in the a.c. voltage waveform. <b>NOTE:</b> Where the equipment has a rated voltage range the following shall apply: <ul style="list-style-type: none"> <li>- 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.</li> <li>- In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.</li> </ul>				

#### Performed tests

U <sub>NOM</sub> [V <sub>AC</sub> ]	Terminal	Test level [% U <sub>NOM</sub> ]	Duration [cycles]		Repetition rate [s]	Number of dips per test	Phase angle [°]
			50 Hz	60 Hz			
380V	0%	U <sub>NOM</sub> –100%	0.5	0.5	10s	3	0
380V	0%	U <sub>NOM</sub> – 100%	1	1	10s	3	0
380V	70%	U <sub>NOM</sub> – 30%	25	30	10s	3	0
380V	0%	U <sub>NOM</sub> –100%	250	300	10s	3	0
1) Applicable only to input ports. 2) Not applicable because no test requirements have been specified for DC/battery powered apparatus.							
Operating mode(s) used		Mode 6					
Observation(s)		During the testing period, the EUT stopped charging. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.					
Supplementary information:							

## 6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

### Conducted disturbance voltage

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
EMI Test Receiver	R&S	ESR3	102355	2022-11-14	2023-11-13
Artificial Mains Network	SCHWARZBECK	NNLK 8129	8129-00541	2022-11-14	2023-11-13
DC Artificial Mains Network	SCHWARZBECK	PVDC 8300	8300-00090	2022-11-14	2023-11-13
Pulse limiter	R&S	ESH3-Z2	102849	2022-11-14	2023-11-13
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03
EMC test software	R&S	EMC 32	V.10.50.40	-	-

### Radiated Emission (30MHz - 1GHz)

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
EMI Test Receiver	R&S	ESR7	102262	2022-11-14	2023-11-13
Broadband Antenna	TESEQ	CBL6112D	55543	2022-01-21	2024-01-20
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03
EMC test software	R&S	EMC 32	V.10.50.40	-	-

### Harmonic current and flicker emissions (16 A < I ≤ 75 A)

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Three-phase harmonic scintillation analyzer	AMETEK	DPA 503	SIPAI/T-J07076	2023-04-21	2025-04-20
3-Phase Multifunctional AC/DC Power Source	AMETEK	NETWAVE 20	P2039244065	2023-04-21	2025-04-20
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03

### ESD

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
ESD Generator	EM TEST	ditto	P1912227709	2022-11-18	2023-11-17
Barometer	Kuanjian	DYM3	32365	2022-08-13	2024-08-12
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03

### Radio-frequency electromagnetic field

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
RF Generator	R&S	SMB100B	104010	2024-02-17	2024-02-16
Power Sensor	R&S	NRP8S	111298	2024-02-17	2024-02-16
Power Sensor	R&S	NRP8S	111350	2024-02-17	2024-02-16
RF amplifier	Rflight	NTWPA-00810200	23013006	2024-02-17	2024-02-16
RF amplifier	Rflight	NTWPA-1060100P	21123258	2024-02-17	2024-02-16
Antenna	Schwarzbeck	STLP 9129 Special	015	N/A	N/A
Field strength probe	Radited	RSS2010E	RS10E-2201006	2024-02-07	2024-02-06
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03

### Electrical fast transients

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
------------	--------------	-----------	------------	------------	----------------

EFT Generator	Shanghai Lioncel	LEG-433C	LEG-433C-0230202	2023-03-29	2024-03-28
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03

#### Surges

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Surge Generator	Shanghai Lioncel	LSG-512H-06CB	512H06CB-0230301	2023-03-29	2024-03-28
decoupling network	Shanghai Lioncel	DN-533P	CN533P-0230303	2023-03-29	2024-03-28
Coupling network	Shanghai Lioncel	CN-533P	DN533P-0210703	2023-03-29	2024-03-28
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03

#### Radio-frequency continuous conducted

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Cs integrated machine	TESEQ	NSG 4070C	53900	2022-11-14	2023-11-13
CDN	TESEQ	CDN M532	53829	2022-11-14	2023-11-13
Current injection probe	TESEQ	CIP 9136A	540038	2022-11-14	2023-11-13
Attenuator	HUAXIANG	WDTS80-6-2.5	211009123	2022-11-14	2023-11-13
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03

#### Power-frequency magnetic field

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Sine wave source	EM TEST	MFG 40-100	P2227265291	2022-11-14	2023-11-13
magnetic field test antenna	EM TEST	MFC 30	P2225264813	2022-11-14	2023-11-13
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03

#### Voltage dips and interruptions

Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Power fail simulator	Shanghai Lioncel	VDS-1132A/TGL-332	0201001/0200901/0200902/0200903	2022-11-14	2023-11-13
Temperature/Humidity Meter	Anymetre	TH604F	1964-1	2022-08-04	2023-08-03



## 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%.

<b>Conducted Emission</b>
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 2.46 dB 150kHz~30MHz: 2.90 dB
<b>Radiated Emission (30MHz-1GHz)</b>
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~200MHz: 4.70 dB 200MHz~1GHz: 4.70 dB Vertical: 30MHz~200MHz: 4.70 dB 200MHz~1GHz: 4.70 dB
<b>Radiated Emission (Above 1GHz)</b>
The maximum measurement uncertainty is evaluated as: Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB
<b>Harmonic current emissions</b>
The maximum measurement uncertainty is evaluated as: 6.1 %.
<b>Voltage fluctuations and flicker</b>
The maximum measurement uncertainty is evaluated as: 6.1 %.
<b>Electrostatic discharge</b>
The maximum measurement uncertainty is evaluated as Rise Time: 6.4 %, Peak Current: 6 %, Current at 30 ns: 6 %, Current at 60 ns: 6 %.
<b>Radio-frequency electromagnetic field</b>
The maximum measurement uncertainty is evaluated as 1.48 dB.
<b>Electrical fast transients</b>
The maximum measurement uncertainty is evaluated as Voltage: 4%, Time: 2 %.
<b>Surges</b>
The maximum measurement uncertainty is evaluated as Voltage: 4%, Time: 2 %.
<b>Radio-frequency continuous conducted</b>
The maximum measurement uncertainty is evaluated as CDN: 1.52 dB, CIP: 1.92 dB.
<b>Power-frequency magnetic field</b>
The maximum measurement uncertainty is evaluated as 10 %.
<b>Voltage dips and interruptions</b>
The maximum measurement uncertainty is evaluated as Voltage: 4 %, Time: 2 %.

8 ANNEX 2 - TEST PHOTOS

Conducted disturbance voltage at AC mains terminals



Conducted disturbance voltage at DC power port



Radiated electromagnetic disturbances (30 MHz to 1000 MHz):Front View



Radiated electromagnetic disturbances (30 MHz to 1000 MHz):Back View



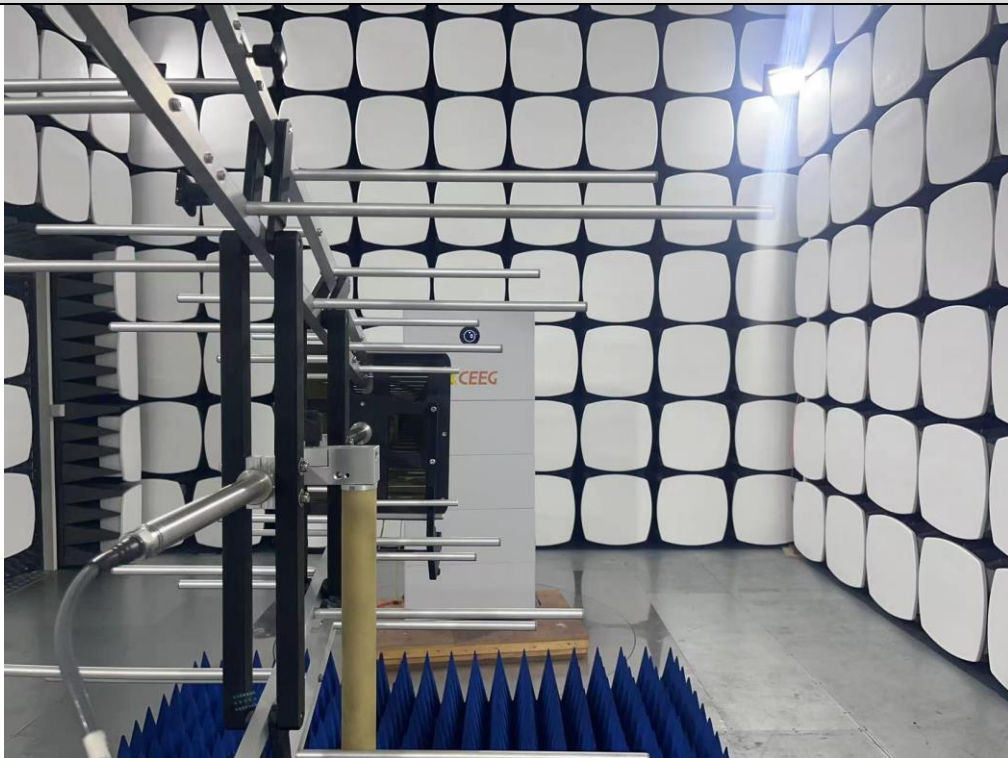
### Harmonic current & flicker emissions



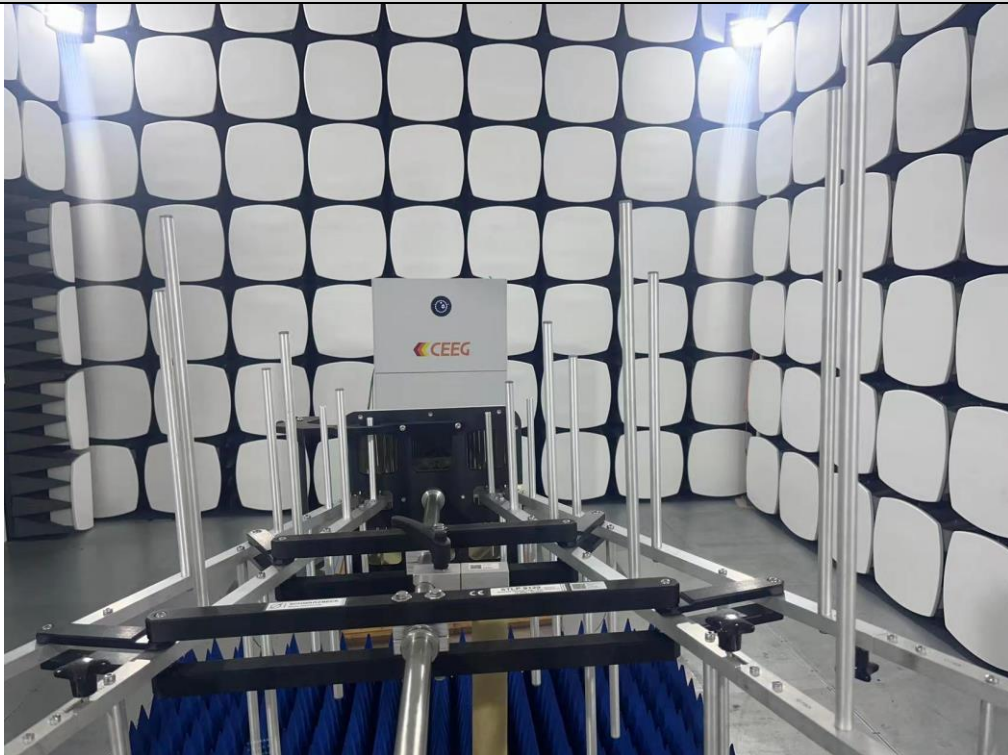
### Electrostatic discharge immunity



**Radiated EM Field Immunity (Below 1GHz)**



**Radiated EM Field Immunity (Above 1GHz)**



**Electrical fast transient (EFT) / Burst transients immunity**



**Surge transients immunity**



**Conducted RF disturbances immunity**



**Power-frequency magnetic field immunity**



**Power supply interruptions and dips immunity**





9 ANNEX 3 - EUT PHOTOS

EUT PHOTOS (1)



EUT PHOTOS (2)



**EUT PHOTOS (3)**



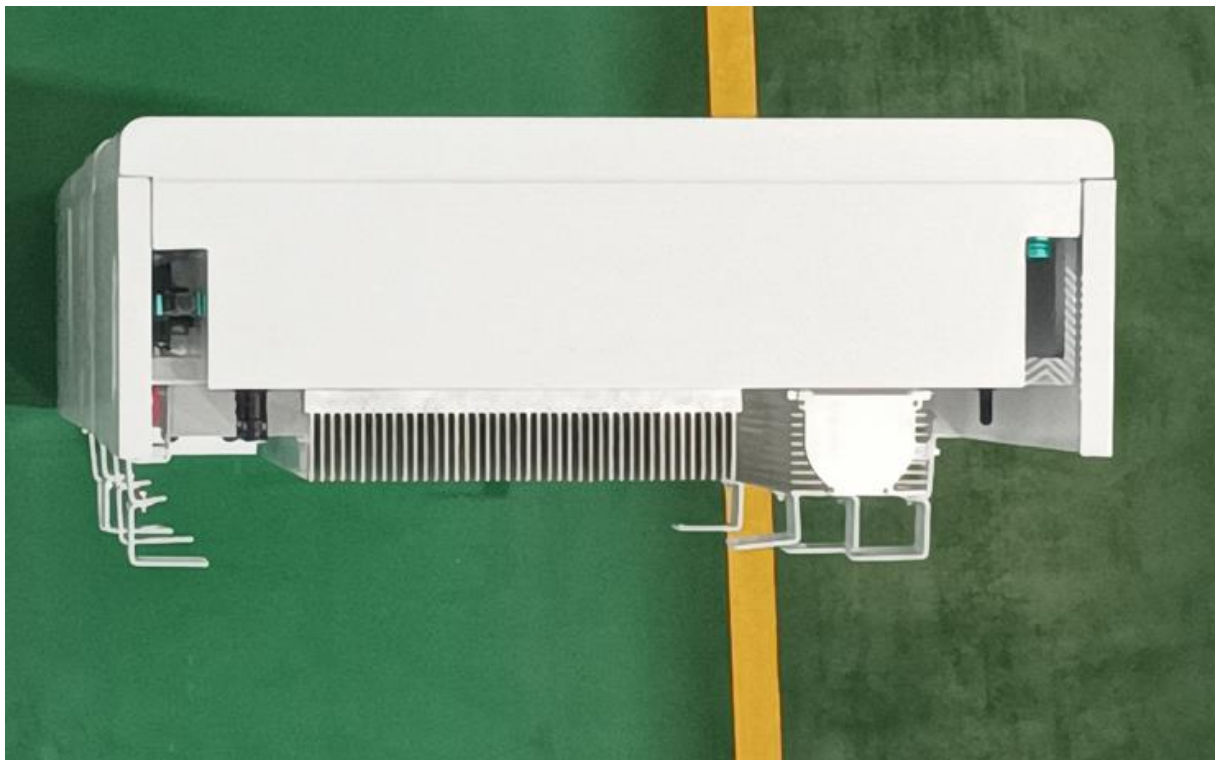
**EUT PHOTOS (4)**



EUT PHOTOS (5)



EUT PHOTOS (6)



End of the report