Shenzhen SOFAR SOLAR Co., Ltd.

TEST REPORT

SCOPE OF WORK
EMC TESTING-SEE PAGE 2

REPORT NUMBER
130918055GZU-002

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Applicant Name & Address	:	Shenzhen SOFAR SOLAR Co., Ltd. 401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen, China
Manufacturing Site	:	Dongguan SOFAR SOLAR Co., Ltd. 1F-6F, Building E, No.1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City
Intertek Report No:		130918055GZU-002 amendment 2

Test standards

EN 61000-6-2:2005
EN 61000-6-4:2007+A1: 2011

Sample Description

Product	:	Solar Inverter
Model No.	:	Sofar 20000TL-Sx Series, Sofar 17000TL-Sx Series , Sofar 15000TL-Sx Series , Sofar 10000TL-Sx Series (x=0-6)
Electrical Rating	:	See page 6
Serial No.		Not Labeled
Date Received	:	26 February 2019
Date Test Conducted	:	28 February 2019

Prepared and Checked By

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Intertek Guangzhou

Approved By:

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Intertek Guangzhou

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1. TEST RESULTS SUMMARY

Test Item	Standard	Result
Continuous conducted disturbance voltage	EN 61000-6-4:2007+A1:2011 Reference: EN 55016-2-1:2009	N/A
Discontinuous conducted disturbance voltage	EN 61000-6-4:2007+A1:2011 Reference: EN 55014-1:2006+A1:2009	N/A
Emission at Telecommunications /network Ports	EN 61000-6-4:2007+A1:2011 Reference: EN 55022:2010	N/A
Radiated emission (30 MHz–1000 MHz)	EN 61000-6-4:2007+A1:2011 Reference: EN 55016-2-3:2010	N/A
Radiated emission (1 GHz–6 GHz)	EN 61000-6-4:2007+A1:2011 Reference: EN 55016-2-3:2010	N/A
ESD immunity	EN 61000-6-2:2005 Reference: EN 61000-4-2:2009	N/A
Inject current immunity	EN 61000-6-2:2005 Reference: EN 61000-4-6:2009	N/A
Surge immunity	EN 61000-6-2:2005 Reference: EN 61000-4-5:2006	N/A
EFT immunity	EN 61000-6-2:2005 Reference: EN 61000-4-4:2012	N/A
Radiated EM filed immunity	EN 61000-6-2:2005 Reference: EN 61000-4-3:2006 +A1:2008+A2:2010	N/A
Voltage dips and interruption immunity	EN 61000-6-2: 2005 Reference: EN 61000-4-11:2004	N/A
Power frequency magnetic field immunity	EN 61000-6-2:2005 Reference: EN 61000-4-8:2010	Pass

Remark:
1. The symbol “N/A” in above table means Not Applicable.
2. When determining the test results, measurement uncertainty of tests has been considered.
3. Harmonics and Flicker are not required.

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2. EMC RESULTS CONCLUSION

Test result:

It is found that the Solar inverter, model Sofar 20000TL-Sx Series, Sofar 17000TL-Sx Series, Sofar 15000TL-Sx Series , Sofar 10000TL-Sx Series (x=0-6) met the requirements of EMC Directive 2014/30/EU and EN 61000-6-4, EN 61000-6-2 standards.

Amendment 1：

Report revision reason:

This report is the revision of the previous test report 130918055GZU-001 dated 24 January 2014 and shall be used together with it.

This report was issued because of the following changes:

1. The EMC Directive has been undated: the EMC Directive has been updated from 2004/108/EC to 2014/30/EU.

2. Change the address of applicant to “5L,Fourth Building,Antongda Industrial Park,Liuxian Avenue No.1,Xinan Street,Baoan District,Shenzhen,China ”

3. Change the model name to “Sofar 20000TL-Sx Series, Sofar 17000TL-Sx Series , Sofar 15000TL-Sx Series , Sofar 10000TL-Sx Series (x=0-6) ”

4. Change the name of factory to “Shenzhen SOFARSOLAR Co., Ltd.”

5. Change the address of factory to “5L,Fourth Building,Antongda Industrial Park,Liuxian Avenue No.1,Xinan Street,Baoan District,Shenzhen,China.”

6. Updated the marking correspond to model.

Amendment 2:

This report is the revision of the previous test report 130918055GZU-001 amendment 1 dated on 08 November 2016 and shall be used together with it.

This report was issued because of the following changes:

1. Added an alternative frequency 60Hz which adjusted by software for all models.

2. Changed the address of applicant from “5/F, Building 4, Antongda Industrial Park, No.1 Liuxian Avenue. Xin’an Street , Bao’an District, Shenzhen, P.R, China ” to “401, Building 4, AnTongDa In-dustrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen, China”

3. Changed the name of factory from“Shenzhen SOFAR SOLAR Co., Ltd.” to “Dongguan SOFAR SOLAR Co., Ltd. ”

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4. Chnaged the address of factory from “5/F, Building 4, Antongda Industrial Park, No.1 Liuxian Avenue. Xin’an Street , Bao’an District, Shenzhen, P.R, China” to “1F-6F, Building E, No.1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City

Based on above changes and engineering judgement, additional test which shown in the summary table were performed on representative model Sofar 20000TL-Sx Series(x=0-6).

The production units are required to conform to the initial sample as received when the units are placed on the market.

Electrical Rating:

Maximum d.c. input voltage: 1000 V

Input voltage rang: 250-960 V

Max. input current: 2×24 A (for Sofar 20000TL-Sx Series); 2×21 A (for Sofar 17000TL-Sx Series, Sofar 15000TL-Sx Series); 2×15 A (for Sofar 10000TL-Sx Series)

Max. PV Isc: 2×30 A (for Sofar 20000TL-Sx Series); 2×27 A (for Sofar 17000TL-Sx Series, Sofar 15000TL-Sx Series); 2×20 A (for Sofar 10000TL-Sx Series)

Nominal output voltage: 3/N/PE230V/400V

Max. output current: 3×29 A (for Sofar 20000TL-Sx Series); 3×25 A (for Sofar 17000TL-Sx Series); 3×22 A (for Sofar 15000TL-Sx Series); 3×15 A (for Sofar 10000TL-Sx Series)

Nominal frequency: 50/60 Hz

Max. output power: 20000 VA (for Sofar 20000TL-Sx Series); 17000 VA (for Sofar 17000TL-Sx Series); 15000 VA (for Sofar 15000TL-Sx Series); 10000 VA (for Sofar 10000TL-Sx Series)

Ingress protection: IP65

Operating temperature range: -25～60℃

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3. LABORATORY MEASUREMENTS

Configuration Information

Support Equipment: N/A

Rated Voltage and frequency under test: See page 6
Condition of Environment: Temperature: 22~28°C
Relative Humidity:35~60%
Atmosphere Pressure:86~106kPa

Notes:
1. The EMS measurements had been made in the frequency bands being investigated, with the EUT in the most susceptible operating mode consistent with normal applications. The configuration of the test sample had been varied to achieve maximum susceptibility.

2. Test Location:
All tests were performed at:
Shenzhen EMTEK Co.,Ltd.
Bldg. 69, Majialong Industry Zone, Nanshan District, Shenzhen,Guangdong,China.

3.Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission (9 kHz-150 kHz)	2.96 dB
2	Conduction Emission (150 kHz-30 MHz)	2.74dB
3	Disturbance Power (30 MHz-300 MHz)	2.53dB
4	Radiated Emission (30 MHz-1 GHz)	H：3.96dB; V：4.04dB
5	Radiated Emission (1 GHz-6 GHz)	4.46dB
6	Radiated Emission (6 GHz-18 GHz)	4.96dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty is calculated in accordance with CISPR16-4-2:2011
The measurement uncertainty is given with a confidence of 95%, k=2.

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4. EQUIPMENT USED DURING TEST

Power Frequency Magnetic Field Immunity				
Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EE006	Magnetic Field Tester	MAG100	HAEFELY	1Y

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5. EMS TEST

Performance Criteria:

Criterion A:	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permission loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and from what the user may reasonably expect from the apparatus if used as intended.
Criterion B:	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permission loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, 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, then either of these may be derived from the product description, and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
Criterion C:	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instruction for use.

Note: "N/A" means Not Applicable in below text.

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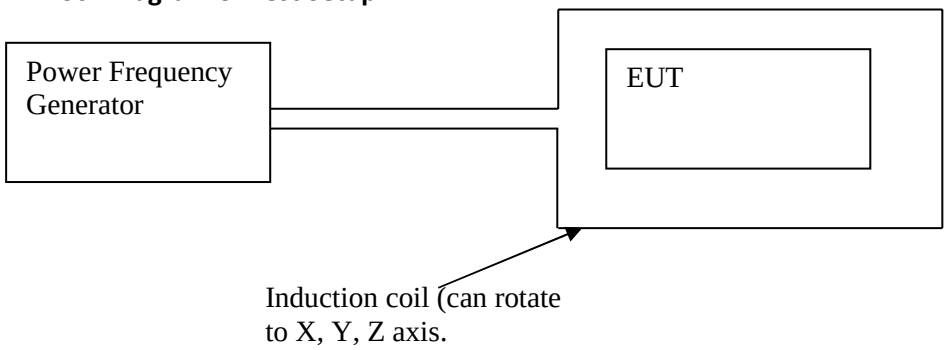
5.1 EN 61000-4-8(Pursuant to EN 61000-6-2) Power Frequency Magnetic Field Immunity

Tested Port: Enclosure
Performance criterion: A
Test Result: Pass

5.1.1 Block Diagram of Test Setup



5.1.2 Test Setup and Procedure

Put EUT into center of induction coil (with suitable dimensions) in the testing.

For tabletop equipment:
The EUT was placed on a big enough wooden desk with height of 0.8m and operating as intended.
The equipment shall be subjected to the test magnetic field by using the induction coil of standards (1m*1m).
The induction coil shall be rotated by 90^0 in order to expose the EUT to the test field with different orientations.

For Floor-standing equipment:
The EUT was placed on big enough wooden desk with height of 0.1m and operating as intended.

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions; the test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different position along the side of the EUT, in steps corresponding to 50% of the shortest side of the coil.

The induction coil shall then be rotated by 90^0 in order to expose the EUT to the test field with different orientations and the same procedure followed.

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5.1.3 Test Result

Mains frequency: ☒ 50 Hz ☒ 60 Hz

Orientations of induction coil	Magnetic Field Strength (A/m)	Result
X	30 A/m	Pass
Y	30 A/m	Pass
Z	30 A/m	Pass

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6. APPENDIX I - PHOTOS OF TEST SETUP

Power frequency magnetic field immunity

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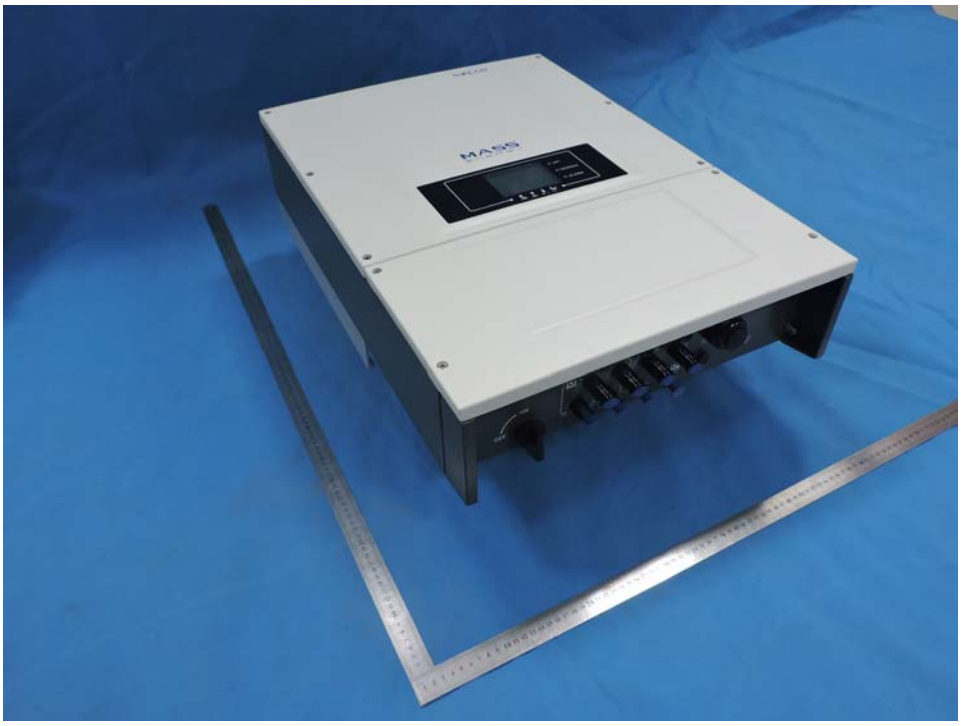
7. APPENDIX II – PHOTOS OF EUT

Over view



**********End of Report**********