Prüfbericht - Produkte
Test Report - Products

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Prüfbericht-Nr.: *Test report no.:*	**NN21PWAL 003**	**Auftrags-Nr.:** *Order no.:*	168320590	Seite 1 von 38 *Page 1 of 38*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2021-05-28	
Auftraggeber: *Client:*	**Sungrow Power Supply Co., Ltd.** No.1699 Xiyou Rd.,New & High Technology Industrial Development Zone, 230088, Hefei, P. R. China			
Prüfgegenstand: *Test item:*	11 kW EV Charger			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	AC011E-01 (Trademark: SUNGROW)			
Auftrags-Inhalt: *Order content:*	RED approval			
Prüfgrundlage: *Test specification:*	EN 301 489-1 V2.2.3 EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-6-1: 2019 EN 61000-6-3: 2007+A1		EN IEC 61000-3-2: 2019 EN 61000-3-3: 2013+A1:2019 IEC 61851-21-2: 2018	
Wareneingangsdatum: *Date of sample receipt:*	2021-06-20			
Prüfmuster-Nr.: *Test sample no.:*	SPO210558-1			
Prüfzeitraum: *Testing period:*	2021-06-20 - 2021-07-12			
Ort der Prüfung: *Place of testing:*	Shenzhen Chengxin Technology Service Co., Ltd.			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			

geprüft von: *tested by:*	Ryan Yang	**genehmigt von:** *authorized by:*	Arthur Liu
Datum: *Date:* 2021-08-02		**Ausstellungsdatum:** *Issue date:* 2021-08-02	
Stellung / Position	Assistant Project Manager	**Stellung** / Position	Technical Certifier

Sonstiges / *Other:*

This report is for Article 3.1b EMC requirements only.

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:* Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged:*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhalt
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	1 = very good	2 = good	3 = satisfactory	4 = sufficient	5 = poor
	P(ass) = passed a.m. test specifications(s)		F(ail) = failed a.m. test specifications(s)	N/A = not applicable	N/T = not tested

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Test Summary

6.1.1 HARMONICS CURRENT EMISSION
RESULT: Pass

6.1.2 VOLTAGE FLUCTUATIONS AND FLICKER
RESULT: Pass

6.1.3 RADIATED EMISSION
RESULT: Pass

6.1.4 RADIATED DISTURBANCE TEST FOR KEYLESS ENTRY
RESULT: Not applicable

6.1.5 CONDUCTED EMISSION
RESULT: Pass

6.2.1 RADIO FREQUENCY ELECTROMAGNETIC FIELD (RS)
RESULT: Pass

6.2.2 ELECTROSTATIC DISCHARGE (ESD)
RESULT: Pass

6.2.3 ELECTRICAL FAST TRANSIENTS (EFT)
RESULT: Pass

6.2.4 RADIO FREQUENCY COMMON MODE (CS)
RESULT: Pass

6.2.5 SURGES
RESULT: Pass

6.2.6 VOLTAGE DIPS AND INTERRUPTIONS
RESULT: Pass

6.2.7 POWER-FREQUENCY MAGNETIC FIELDS
RESULT: Pass

Contents

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:
Appendix A: Test Results of Article 3.1b EMC Requirements.

2 Test Sites

2.1 Test Facilities

Shenzhen Chengxin Technology Service Co., Ltd.

Tongfuyu Industrial Zone, No. 13 North of Aiqun Road, Shiyan Town, Baoan District,

CNAS Registration No.: L12944

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Shenzhen Chengxin Technology Service Co., Ltd.

Harmonics and Flicker				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Harmonic Flicker analyzer	TESEQ	CCN1000-3	TE18080052	2021-08-05
Power Supply	Chroma	61860	TE18080043	2021-07-14
Radiated Disturbance (10m Chamber)				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
10m Chamber	EMC-united	21.1x12.4x8.55M(H)	TE18080063	2022-04-16
Broadband Antenna	SCHWARZBECK	VULB 9162	TE18080009	2022-03-20
Annular Antenna	SCHWARZBECK	FESP 5133-7/41	TE18080082	2021-07-28
Test Receiver	R&S	ESR 3	TE18080088	2021-09-26
Test Receiver	R&S	ESCI 7	TE18080002	2022-02-28
Horn Antenna	SCHWARZBECK	BBHA 9120D	TE18080004	2022-03-04
Conducted Emission				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Test Receiver	R&S	ESCI 7	TE18080002	2022-02-28
LISN	SCHWARZBECK	NNLK8130	TE18080014	2022-03-03
LISN	SCHWARZBECK	NNHV 8123-200	TE18080027	2022-02-28
LISN	SCHWARZBECK	NNHV 8123-200	TE18080028	2022-02-28
ISN	SCHWARZBECK	CAT 5 8158 ISN 8 Wire	TE20020001	2022-03-03

Radio Frequency Electromagnetic Fields (RS)				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Signal Generator	Agilent	N5181A	TE18080045	2021-07-14
Power Meter	Agilent	N1914A	TE18080058	2021-07-14
EMS Antenna	SCHWARZBECK	STLP 9128 E	TE18080007	2022-02-03
EMS Antenna	SCHWARZBECK	BBHA 9120 J	TE18080005	2022-02-03
Power Amplifier	TESEQ	CBA 1G-1200B	TE18080055	2021-07-14
Power Amplifier	MILMEGA	AS0104-200/200	TE18080063	2021-07-14
Power Amplifier	MILMEGA	CBA 6G-080D	TE18080012	2021-07-14
Electrostatic Discharge (ESD)				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
ESD Test System	TESEQ	NSG 437	TE18080035	2022-03-08
Electrical Fast Transients (EFT)				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
EFT/Surge Test System	EM TEST	UCS500N7.2	TE18080036	2022-02-28
	EM TEST	CNI503B9.4/100A	TE18080037	2022-02-28
Capacitive clamp	EM TEST	CCI	TE18080034	2021-07-14
Radio Frequency Common Mode (CS)				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Signal Generator	R&S	SML01	TE18080048	2021-11-10
Power Meter	Agilent	N1914A	TE18080058	2021-07-14
Power Amplifier	AMETEK	SCDX150	TE18080013	2021-07-14
Injection probe	TESEQ	CIP 9136A	TE18080029	2022-06-16
CDN	SCHWARZBECK	T8 RJ45	TE18080023	2022-02-28
Surges				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
EFT/Surge Test System	EM TEST	UCS500N7.2	TE18080036	2022-02-28
	EM TEST	CNI503B9.4/100A	TE18080037	2022-02-28
Voltage Dips and Interruptions				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Power Supply	Chroma	61860	TE18080043	2021-07-14
Voltage Dip Switch	TESEQ	NSG 2200-3	TE18080054	2021-08-05
Power-frequency Magnetic Fields				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Magnetic Field Tester	3C TEST	MFS 1200	TE18080040	2021-07-14
Magnetic Field Test Coil	3C TEST	TCXS 113	TE18080041	2021-07-14

2.3 Uncertainty of Measurement

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

Table 2: Measurement Uncertainty

Test	Parameters	Uncertainty
Conducted Emission	9kHz to 150kHz	3.7 dB
	150kHz to 30MHz	3.3 dB
Radiated Emission	30MHz to 1000MHz	4.5 dB
	above 1000MHz	5.0 dB

3 General Product Information

3.1 Product Function and Intended Use

The product is a three-phase AC charger is used for electric vehicle's AC charging, which supports Wi-Fi 802.11 b/g/n and RFID (13.56MHz) function.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	11 kW EV Charger
Type Designation	AC011E-01
Trademark	SUNGROW
Operating Voltage	AC 400V ± 10%, 50/60Hz (three phases)
Testing Voltage	AC 400V

3.3 Independent Operation Modes

The basic operation modes are:

A. On, Wi-Fi b/g/n operating mode
B. On, RFID operating mode
C. On, Charging mode (20% & 80% of max. rated power)
D. Standby mode (Waiting mode)
E. Off

3.4 Noise Generating and Noise Suppressing Parts

For details refer to the Circuit Diagram.

3.5 Submitted Documents

- User Manual

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

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

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

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5 and chapter 6.

According to clause 3.1, all tests were performed on model *AC011E-01* in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Oscilloscope	YOKOGAWA	DLM 2024	TS18070014	N/A
Multimeter	Fluke	Fluke 15B+	TE18080131	N/A
Load ark	SIKES	SKS-RDC-160KW-750/1000V	TE18080102	N/A
Load ark	SIKES	SKS-RDC-160KW-750	TE18080103	N/A
Laptop computer	Dell	Inspiron 5488	OA18070014	N/A
Loading Cabinet	SIKES	SKS-RAC-20kW/0.38	TE18080099	N/A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

5 Immunity Performance Criteria

The "pass/fail" performance criterion to be used during test is detailed below:

5.1 Performance Criteria of EN 301 489-3 & 17

In the table below:
Performance criterion A applies for immunity tests with phenomena of a continuous nature;
Performance criterion B applies for immunity tests with phenomena of a transient nature.

Table 5: Performance Criteria of EN 301 489-3 & 17

Criterion	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions

5.2 Performance Criteria of EN 61000-6-1

Performance criteria A
The apparatus 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 apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. 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 apparatus if used as intended.

Performance criteria B
Performance 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 specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. 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 an documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criteria C

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

5.3 Performance Criteria of IEC 61851-21-2

Performance criteria A

The EUT shall continue to operate as intended within the tolerances defined by the EUT manufacturer during and after the application of the appropriate tests. It shall not change the state in which it is operating (i.e. charging shall continue if in charge mode and shall remain idle if in waiting mode).
NOTE: A change of state includes the control/communication lines of the CPT port and any change in charging current for DC charging (beyond the tolerance defined by the manufacturer).

Performance criteria B

The EUT shall continue to operate as intended within the tolerances defined by the EUT manufacturer at the completion of the applicable tests. Additionally, during the application of the appropriate tests the primary functions of the charger shall be maintained (within the tolerances defined by the EUT manufacturer). Secondary functions (for example displays, etc.) may degrade in performance during the test but shall resume to the original condition subsequent to testing.

Subsequent to the application of the applicable test, the EUT shall not have changed the state in which it is operating (i.e. charging shall continue if in charge mode and shall remain idle if in waiting mode).
NOTE: A change of state includes the control/communication lines of the CPT port and any change in charging current for DC charging (beyond the tolerance defined by the charging equipment manufacturer).

Performance criteria C

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

6 Test Results of EMC Requirement

6.1 Test Results of EMISSION

6.1.1 Harmonics Current Emission

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-3-2: 2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN IEC 61000-3-2: 2019 IEC 61000-3-2: 2014
Measured harmonics	:	2 – 40
Class	:	A
Limit	:	EN IEC 61000-3-2: 2019, Table 3

Test Setup

Date of testing	:	2021-06-23
Test voltage	:	AC 400V
Operation mode	:	C
Test ports	:	☒ AC mains ports
Earthing	:	Connected
Test configuration	:	Table-top
Ambient temperature	:	25 ℃
Relative humidity	:	61 %
Atmospheric pressure	:	101 kPa

This testing was carried out on all different operation modes, but only the worst case was presented in this report.

For the measurement records, refer to the appendix A.

6.1.2 Voltage Fluctuations and Flicker

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN 61000-3-3: 2013+A1:2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 61000-3-3: 2013+A1:2019 IEC 61000-3-3: 2013
Frequency range	:	0 - 2 KHz
Limit	:	EN 61000-3-3: 2013+A1:2019, Clause 5

Test Setup

Date of testing	:	2021-06-23
Test voltage	:	AC 400V
Operation mode	:	C
Test ports	:	☒ AC mains ports
Earthing	:	Connected
Test configuration	:	Table-top
Ambient temperature	:	25 ℃
Relative humidity	:	61 %
Atmospheric pressure	:	101 kPa

This testing was carried out on all different operation modes, but only the worst case was presented in this report.

For the measurement records, refer to the appendix A.

6.1.3 Radiated Emission

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN 61000-6-3: 2007+A1 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 55032: 2015
Test requirement	:	EN 301 489-1 V2.2.3, Clause 8.2 EN 61000-6-3: 2007+A1, Clause 11 IEC 61851-21-2: 2018, Clause 6.3.5
Classification	:	Class B
Frequency range	:	30 MHz – 6 GHz
Kind of test site	:	10m Semi-anechoic Chamber for 30MHz – 1GHz 3m Semi-anechoic Chamber for 1GHz – 6GHz
Limit	:	EN 301 489-1 V2.2.3, Clause 8.2.3 EN 61000-6-3: 2007+A1, Table 1 IEC 61851-21-2: 2018 Table 18 & 19

Test Setup

Date of testing	:	2021-07-02
Test voltage	:	AC 400V
Operation mode	:	C
Test Ports	:	Enclosure
Earthing	:	Connected
Ambient temperature	:	25 ºC
Relative humidity	:	55%
Atmospheric pressure	:	101.0 kPa

For the measurement records, refer to the appendix A.

6.1.4 Radiated Disturbance Test for Keyless Entry

RESULT: **Not applicable**

Test Specification

Test standard	:	IEC 61851-21-2: 2018
Test requirement	:	IEC 61851-21-2: 2018, Annex B.3
Frequency range	:	2 KHz – 185 KHz

Exemption Condition(s):
According to Annex B.4 of IEC 61851-21-2, this requirement is applicable only to DC charging equipment.

6.1.5 Conducted Emission

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN 61000-6-3: 2007+A1 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 55032: 2015
Test requirement	:	EN 301 489-1 V2.2.3, Clause 8.4 & 8.7 EN 61000-6-3: 2007+A1, Clause 11 IEC 61851-21-2: 2018, Clause 6.3.2 & 6.3.4
Classification	:	Class B
Frequency range	:	150 KHz - 30 MHz
Kind of test site	:	Shielded Room
Limit	:	EN 301 489-1 V2.2.3, Clause 8.4.3 & 8.7.3 EN 61000-6-3: 2007+A1, Table 2 & 4 IEC 61851-21-2: 2018, Table 8 & 14

Test Setup

Date of testing	:	2021-07-02
Test voltage	:	AC 400V
Operation mode	:	A, B, C
Test ports	:	☒ AC mains ports ☐ CPT ports ☒ Signal port
Earthing	:	Connected
Test configuration	:	Table-top
Ambient temperature	:	20 ℃
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

Note: Since the AC charging EUT does not contain any electronic power converters or the like, but only switches and safety disconnectors, then it is sufficient to measure the disturbance voltage at its LV AC power input port only (see 6.3.2 of IEC 61851-21-2: 2018).

For the measurement records, refer to the appendix A.

6.2 Test Results of IMMUNITY

6.2.1 Radio Frequency Electromagnetic Field (RS)

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-6-1: 2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 61000-4-3:2006+A1+A2 IEC 61000-4-3:2006+A1+A2
Test requirement	:	EN 301 489-1 V2.2.3, Clause 9.2 EN IEC 61000-6-1: 2019, Table 1 IEC 61851-21-2: 2018, Table 2
Frequency range	:	80 - 6000 MHz 80 - 1000 MHz, 1400 - 2000 MHz, 2000 - 6000 MHz
Test level	:	3 V/m, (unmodulated, r.m.s)
Modulation	:	80% AM by a sinusoidal signal of 1KHz
Kind of test site	:	10m Semi-anechoic Chamber
Performance criteria	:	Criterion A in section 5.1 of the present report Criterion A in section 5.2 of the present report Criterion A in section 5.3 of the present report

Test Setup

Date of testing	:	2021-06-29
Test voltage	:	AC 400V
Operation mode	:	A, B, C, D
Test Ports	:	Enclosure
Earthing	:	Connected
Ambient temperature	:	20 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Table 6: Test Result of Radio Frequency Electromagnetic Field (RS)

Mode	Frequency Range	Test port / Test Level	Polarity	Location	Result	Performance criterion
A, B	80 - 1000 MHz	Enclosure 3 V/m	Vertical / Horizontal	Front	Pass	A
				Rear	Pass	A
				Left	Pass	A
				Right	Pass	A
	1000 - 6000 MHz	Enclosure 3 V/m	Vertical / Horizontal	Front	Pass	A
				Rear	Pass	A
				Left	Pass	A
				Right	Pass	A
Mode	**Frequency Range**	**Test port / Test Level**	**Polarity**	**Location**	**Result**	**Performance criterion**
C, D	80 - 1000 MHz	Enclosure 3 V/m	Vertical / Horizontal	Front	Pass	A
				Rear	Pass	A
				Left	Pass	A
				Right	Pass	A
	1400 - 2000 MHz	Enclosure 3 V/m	Vertical / Horizontal	Front	Pass	A
				Rear	Pass	A
				Left	Pass	A
				Right	Pass	A
	2000 - 6000 MHz	Enclosure 3 V/m	Vertical / Horizontal	Front	Pass	A
				Rear	Pass	A
				Left	Pass	A
				Right	Pass	A

*Remark: No degradation was observed during and after the tests.

6.2.2 Electrostatic Discharge (ESD)

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-6-1: 2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 61000-4-2:2009
Test requirement	:	EN 301 489-1 V2.2.3, Clause 9.3 EN IEC 61000-6-1: 2019, Table 1 IEC 61851-21-2: 2018, Table 2
Discharge impedance	:	330 Ω / 150 pF
Test level	:	Air discharge: ± 2 kV, ± 4 kV, ± 8 kV Contact discharge: ± 4 kV HCP & VCP: ± 4 kV
Position	:	All exposed surfaces
Performance criteria	:	Criterion B in section 5.1 of the present report Criterion B in section 5.2 of the present report Criterion B in section 5.3 of the present report

Test Setup

Date of testing	:	2021-06-29
Test voltage	:	AC 400V
Operation mode	:	A, B, C, D
Test Ports	:	Enclosure
Earthing	:	Connected
Ambient temperature	:	20 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Table 7: Test Result of Electrostatic Discharge (ESD)

Test Mode	Test Level	Location	Actual Performance
A, B, C, D	± 4 kV / Contact	HCP	A*
		VCP	A*
		Conducted Enclosure	A*
	± 2.0kV, ± 4.0kV, ± 8.0kV / Air	Non-conducted Enclosure	A*
		Button	A*
		Slot	A*

*Remark: No degradation was observed during and after the tests.

6.2.3 Electrical Fast Transients (EFT)

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-6-1: 2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 61000-4-4: 2012 IEC 61000-4-4: 2012
Test requirement	:	EN 301 489-1 V2.2.3, Clause 9.4 EN IEC 61000-6-1: 2019, Table 2 & 4 IEC 61851-21-2: 2018, Table 2
Test level	:	±0.5kV, ±1kV, ±2kV
Test duration	:	1 minute per level & polarity
Rise time	:	5/50ns
Repetition frequency	:	5 KHz
Performance criteria	:	Criterion B in section 5.1 of the present report Criterion B in section 5.2 of the present report Criterion B in section 5.3 of the present report

Test Setup

Date of testing	:	2021-06-29
Test voltage	:	AC 400V
Operation mode	:	A, B, C, D
Test Ports	:	☒ AC mains ports ☒ CPT ports ☒ Signal port
Earthing	:	Connected
Ambient temperature	:	20 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Table 8: Test Result of Electrical Fast Transients (EFT), AC mains port

Coupling Method: Direct Injection			
Test Mode	**Coupling Port**	**Test Voltage / Result**	**Remark / Performance Criterion**
A, B	AC mains: L1, L2, L3, N **PE**	±1 kV Passed	EUT operated as intended, no degradation of function. / Performance criterion A
C, D	AC mains: L1, L2, L3, N **PE**	±2 kV Passed	EUT operated as intended, no degradation of function. / Performance criterion A

Table 9: Test Result of Electrical Fast Transients (EFT), Signal port

Coupling Method: Capacitive Clamp			
Test Mode	**Coupling Port**	**Test Voltage / Result**	**Remark / Performance Criterion**
A, B	Signal port: Line – Ground **--**	±0.5 kV Pass	EUT operated as intended, no degradation of function. / Performance criterion A
C, D	Signal port: Line – Ground **--**	±1 kV Pass	EUT operated as intended, no degradation of function. / Performance criterion A

Table 10: Test Result of Electrical Fast Transients (EFT), CPT ports

Coupling Method: Capacitive Clamp			
Test Mode	**Coupling Port**	**Test Voltage / Result**	**Remark / Performance Criterion**
C, D	CPT port: Positive, Negative, Ground **--**	±0.5 kV, ±2 kV Pass	EUT operated as intended, no degradation of function. / Performance criterion A

6.2.4 Radio Frequency Common Mode (CS)

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-6-1: 2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 61000-4-6: 2009 IEC 61000-4-6: 2009
Test requirement	:	EN 301 489-1 V2.2.3, Clause 9.5 EN IEC 61000-6-1: 2019, Table 2 & 4 IEC 61851-21-2: 2018, Table 2
Frequency range	:	0.15 - 80 MHz
Source impedance	:	150 Ω
Test level	:	3V (unmodulated, r.m.s.)
Modulation	:	AM 80%, 1 KHz sine-wave
Sweep mode	:	Automatic
Sweep rate	:	$< 1.5 \times 10^{-3}$ decade / sec.
Performance criteria	:	Criterion A in section 5.1 of the present report Criterion A in section 5.2 of the present report Criterion A in section 5.3 of the present report

Test Setup

Date of testing	:	2021-06-29
Test voltage	:	AC 400V
Operation mode	:	A, B, C
Test Ports	:	☒ AC mains ports ☒ CPT ports ☒ Signal port
Earthing	:	Connected
Ambient temperature	:	20 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Table 11: Test Result of Radio-Frequency Common Mode (CS), AC mains ports

Test Mode	Test port	Test level	Coupling method	Result	Performance Criterion
A, B	AC mains port	3V	Direct injection	Pass	EUT operated as intended, no degradation of function. / Performance criterion A
C, D	AC mains port	3V	Direct injection	Pass	EUT operated as intended, no degradation of function. / Performance criterion A

Table 12: Test Result of Radio-Frequency Common Mode (CS), Signal port

Test Mode	Test port	Test level	Coupling method	Result	Performance Criterion
A, B	Signal port	3V	EM coupling clamp	Pass	EUT operated as intended, no degradation of function. / Performance criterion A
C, D	Signal port	3V	EM coupling clamp	Pass	EUT operated as intended, no degradation of function. / Performance criterion A

Table 13: Test Result of Radio-Frequency Common Mode (CS), CPT ports

Test Mode	Test port	Test level	Coupling method	Result	Performance Criterion
C, D	CPT	3V	EM coupling clamp	Pass	EUT operated as intended, no degradation of function. / Performance criterion A

6.2.5 Surges

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-6-1: 2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 61000-4-5: 2006 IEC 61000-4-5: 2014
Test requirement	:	EN 301 489-1 V2.2.3, Clause 9.8 EN IEC 61000-6-1: 2019, Table 2 & 4 IEC 61851-21-2: 2018, Table 2
Test level	:	±0.5kV, ±1 kV, ±2 kV
Number of surges	:	5 (for each combination of parameters)
Repetition rate	:	Max. 1/min
Performance criteria	:	Criterion B in section 5.1 of the present report Criterion B in section 5.2 of the present report Criterion B in section 5.3 of the present report

Test Setup

Date of testing	:	2021-06-29
Test voltage	:	AC 400V
Operation mode	:	A, B
Test Ports	:	☒ AC mains ports ☐ CPT ports ☒ Signal port
T_r / T_h	:	1,2 / 50 µs
Earthing	:	Connected
Ambient temperature	:	20 °C
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Note:
According to table 1 of IEC 61851-21-2, this requirement is not required for CPT port if the power input and output are directly connected in charge mode using a mechanical switching device.

Table 14: Test Result of Surges, AC mains port

Test Mode	Coupling Port	Test Voltage	Coupling Phase	Result	Remark / Performance Criterion
A, B	AC mains: L1, L2, L3, N **PE**	±0.5 kV / line – line ±1 kV / line – ground	0, π/2, π, 3π/2	Pass	EUT operated as intended, no degradation of function. / Performance criterion A
Test Mode	**Coupling Port**	**Test Voltage**	**Coupling Phase**	**Result**	**Remark / Performance Criterion**
C, D	AC mains: L1, L2, L3, N **PE**	±1 kV / line – line ±2 kV / line – ground	0, π/2, π, 3π/2	Pass	EUT operated as intended, no degradation of function. / Performance criterion A

Table 15: Test Result of Surges, Signal port

Test Mode	Coupling Port	Test Voltage	Coupling Phase	Result	Remark / Performance Criterion
A, B	Signal port:	±0.5 kV / line – line	N/A	Pass	EUT operated as intended, no degradation of function. / Performance criterion B
Test Mode	**Coupling Port**	**Test Voltage**	**Coupling Phase**	**Result**	**Remark / Performance Criterion**
C, D	Signal port:	±1 kV / line – line	N/A	Pass	EUT operated as intended, no degradation of function. / Performance criterion B

6.2.6 Voltage Dips and Interruptions

RESULT: **Pass**

Test Specification

Test standard	:	EN 301 489-3 V2.1.2 (Draft) EN 301 489-17 V3.2.4 EN IEC 61000-6-1: 2019 IEC 61851-21-2: 2018
Basic standard	:	EN 301 489-1 V2.2.3 EN 61000-4-11: 2004 IEC 61000-4-11: 2004
Test requirement	:	EN 301 489-1 V2.2.3, Clause 9.7 EN IEC 61000-6-1: 2019, Table 4 IEC 61851-21-2: 2018, Table 2
Performance criteria	:	Criterion B in section 5.1 of the present report Criterion B&C in section 5.2 of the present report Criterion B&C in section 5.3 of the present report

Test Setup

Date of testing	:	2021-06-29
Test voltage	:	AC 400V
Operation mode	:	A, B, C, D
Test Ports	:	☒ AC mains ports ☐ CPT ports ☐ Signal port
Earthing	:	Connected
Ambient temperature	:	20 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Table 16: Test Result of Voltage Dips and Interruptions, AC mains ports

Test Mode	Coupling port	Voltage reduction (%)	Reduction time (ms)	Result	Remark / Performance Criterion
A, B, C, D	AC mains ports	100%	10	Pass	EUT operated as intended, no degradation of function. / Performance criterion A
		100%	20	Pass	EUT operated as intended, no degradation of function. / Performance criterion A
		60%	200	Pass	EUT operated as intended, no degradation of function. / Performance criterion A
		30%	500	Pass	EUT operated as intended, no degradation of function. / Performance criterion A
		100%	5000	Pass	EUT operated as intended, no degradation of function. / Performance criterion B

6.2.7 Power-frequency Magnetic Fields

RESULT: **Pass**

Test Specification

Test standard	:	EN IEC 61000-6-1: 2019
		IEC 61851-21-2: 2018
Basic standard	:	IEC 61000-4-8: 2009
Test requirement	:	EN IEC 61000-6-1: 2019, Table 4
		IEC 61851-21-2: 2018, Table 2
Test level	:	30A/m
Performance criteria	:	Criterion A in section 5.2 of the present report
		Criterion A in section 5.3 of the present report

Test Setup

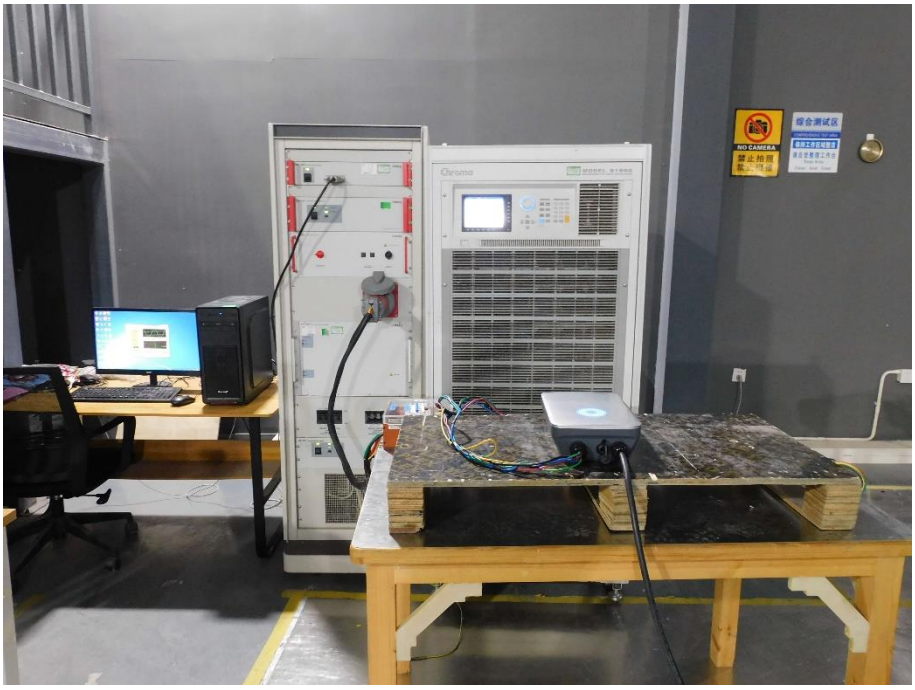
Date of testing	:	2021-06-29
Test voltage	:	AC 400V
Operation mode	:	C, D
Test Ports	:	Enclosure
Earthing	:	Connected
Ambient temperature	:	20 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Table 17: Test Result of Magnetic Fields

Mode	Coupling Port	Test Level	Result	Remark / Performance Criterion
C, D	Enclosure	30 A/m	Pass	EUT operated as intended, no degradation of function. / Performance criterion A

7 Photographs of the Test Set-Up

Photograph 1: Set-up for Harmonics Current Emission & Voltage Fluctuations and Flicker

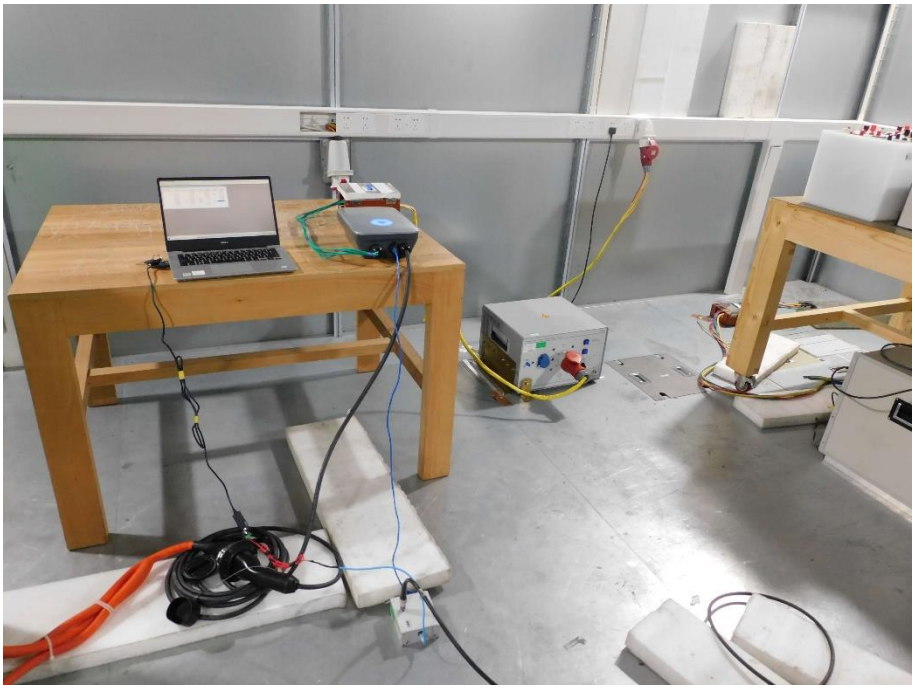


Photograph 2: Set-up for Radiated Emission, Below 1GHz

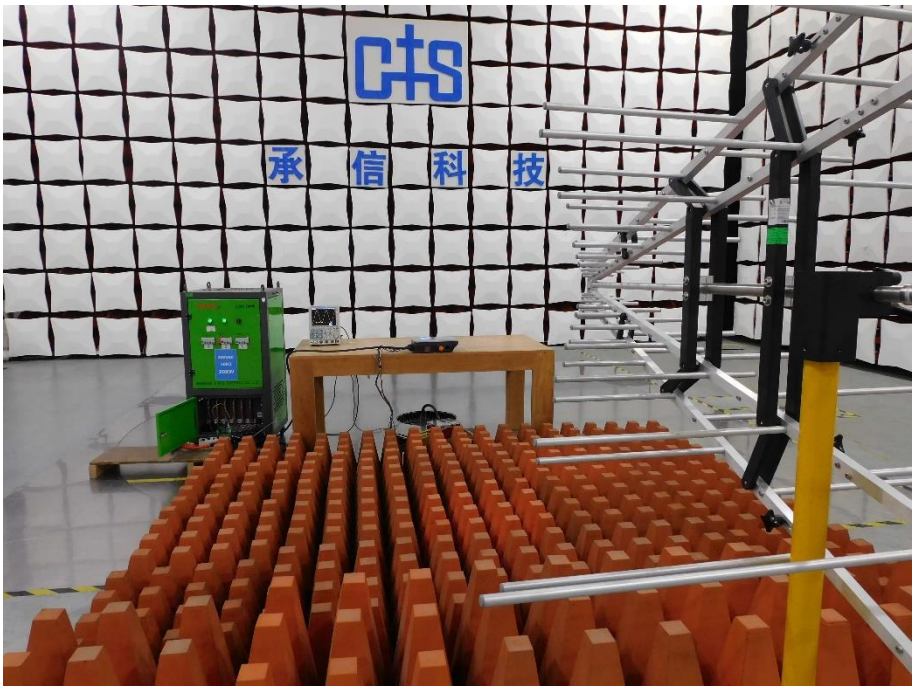
Photograph 3: Set-up for Radiated Emission, Above 1GHz

Photograph 4: Set-up for Conducted Emission, AC Mains Port

Photograph 5: Set-up for Conducted Emission, Signal Port

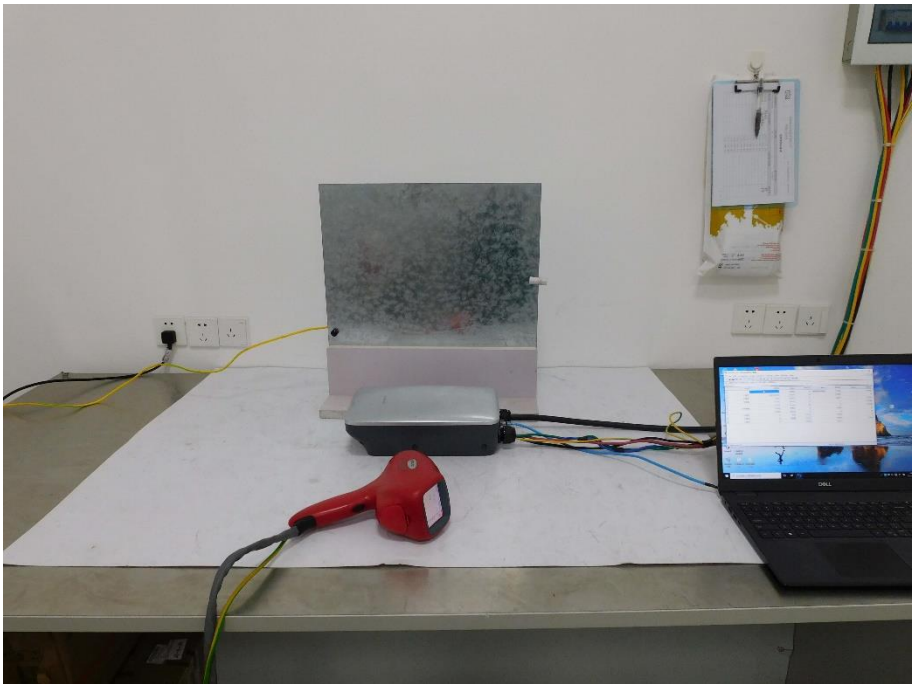


Photograph 6: Set-up for Radio Frequency Electromagnetic Field (RS), Below 1GHz



Photograph 7: Set-up for Radio Frequency Electromagnetic Field (RS), Above 1GHz

Photograph 8: Set-up for Electrostatic Discharge (ESD)

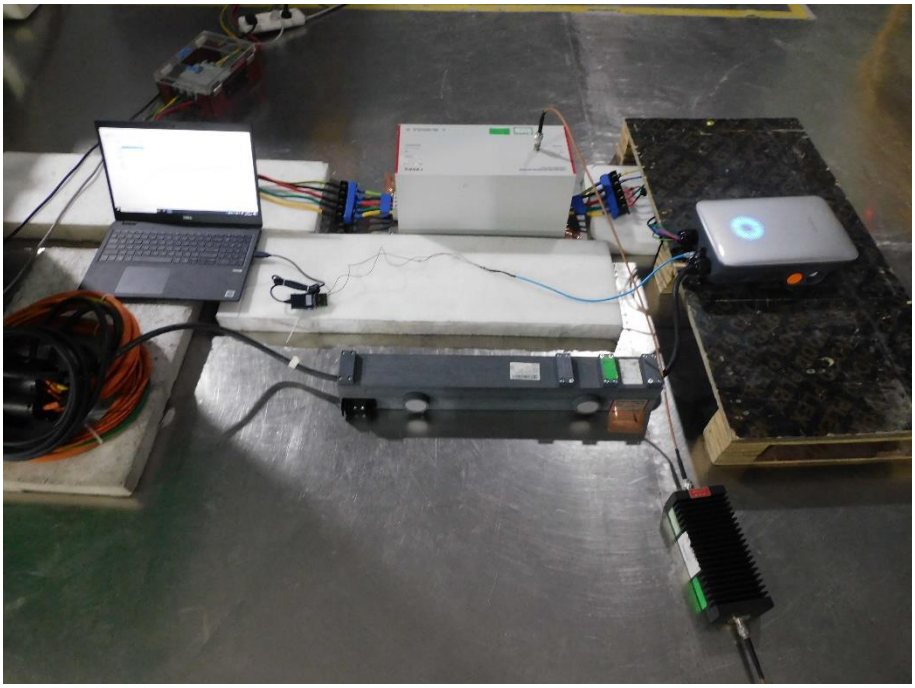


Photograph 9: Set-up for Electrical Fast Transients (EFT), AC Mains Port

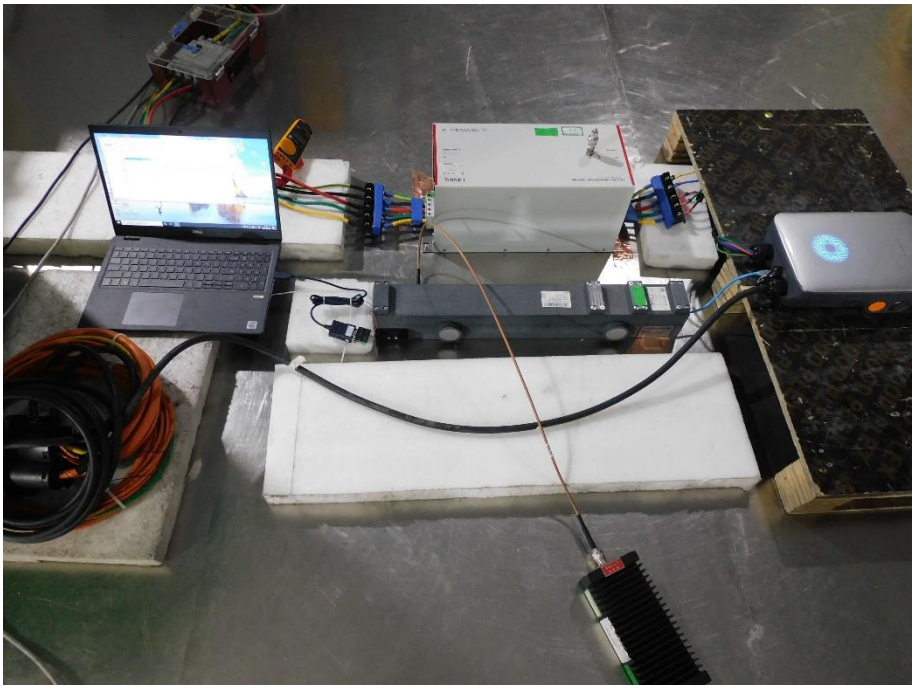
Photograph 10: Set-up for Electrical Fast Transients (EFT), Signal Port

Photograph 11: Set-up for Electrical Fast Transients (EFT), CPT Ports

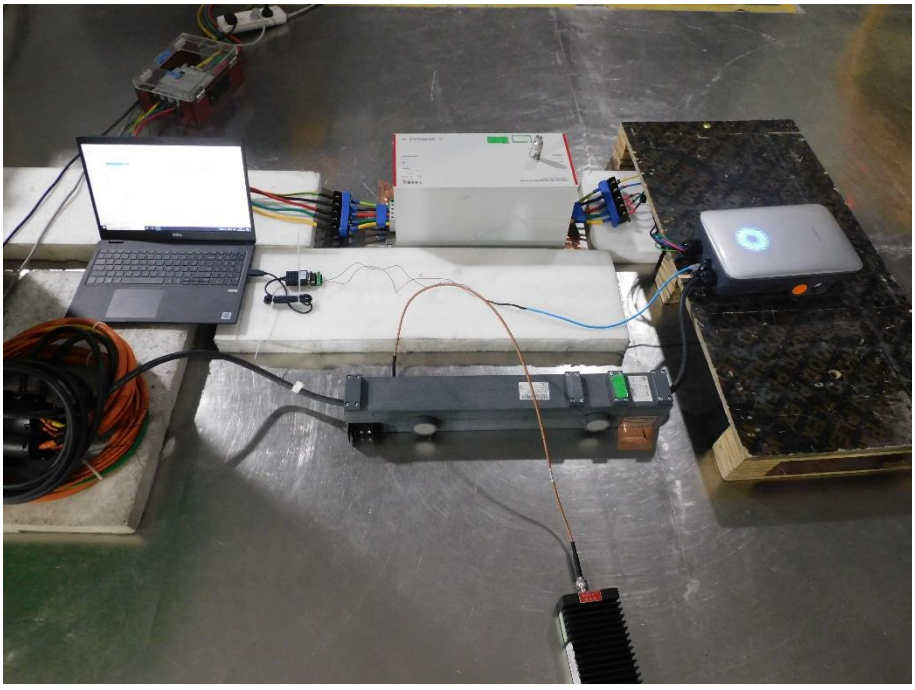
Photograph 12: Set-up for Radio Frequency Common Mode (CS), AC Mains Port



Photograph 13: Set-up for Radio Frequency Common Mode (CS), Signal Port



Photograph 14: Set-up for Radio Frequency Common Mode (CS), CPT Ports

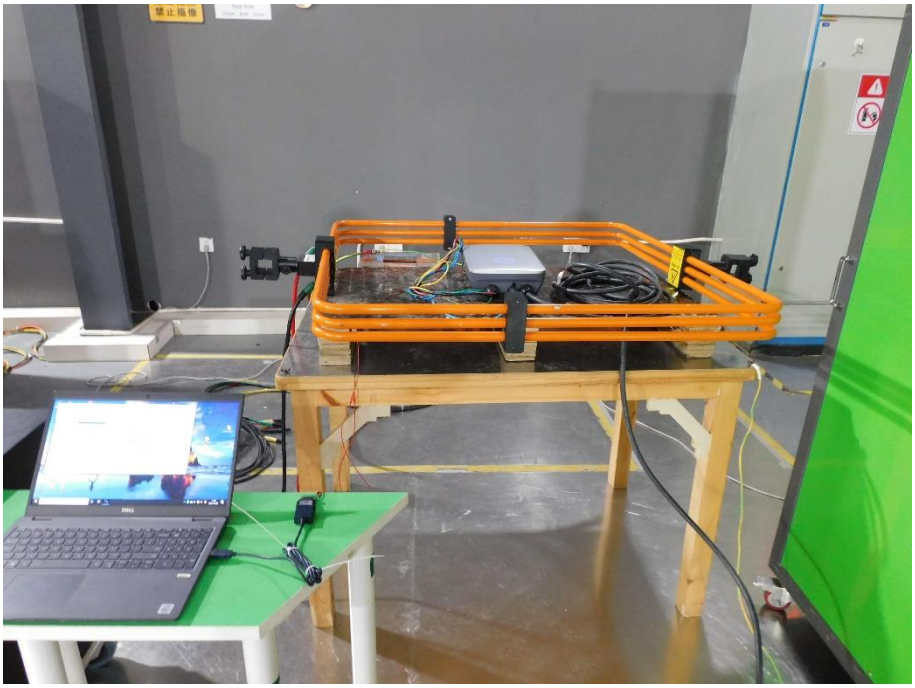


Photograph 15: Set-up for Surge, AC Mains Port

Photograph 16: Set-up for Surge, Signal Port

Photograph 17: Set-up for Voltage Dips and Interruptions

Photograph 18: Set-up for Power-frequency Magnetic Fields



8 List of Tables

9 List of Photographs

Appendix A: Test Results of Article 3.1b EMC Requirements

Appendix A.1: Test Results of Harmonics Current Emission

AC mains port input

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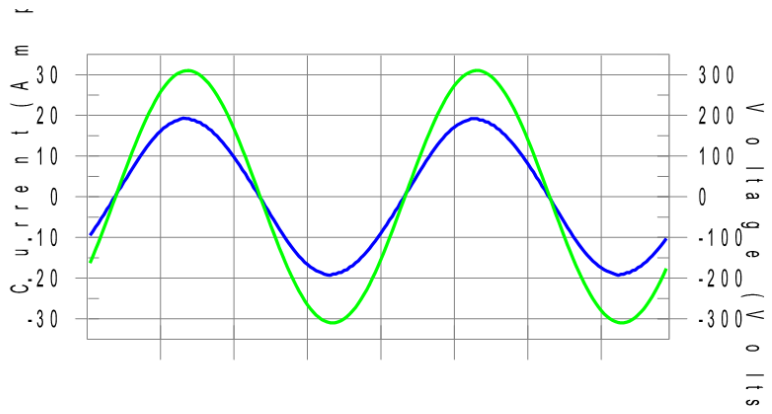
Harmonics – Class-A per Ed. 5.0 (2018)(Phase A-Run time)

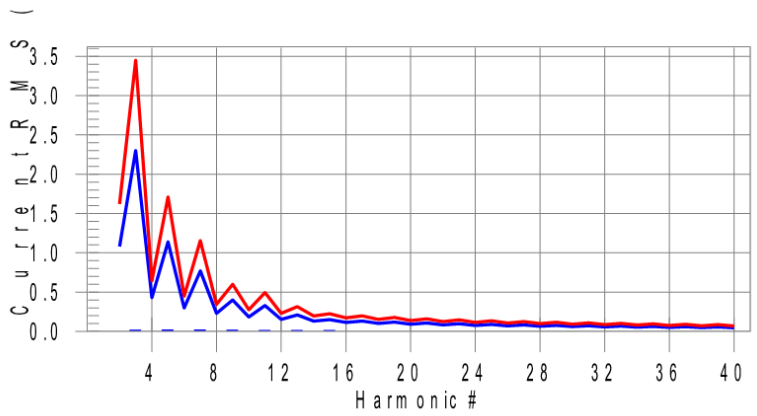
EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass **Worst harmonics H15-7.0% of 150% limit, H15-9.2% of 100% limit.**

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Current Test Result Summary (Phase A-Run time)

EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**
THC(A): 0.048 **I-THD(%): 0.4** **POHC(A): 0.014** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	219.527	Frequency(Hz):	50.00
I_Peak (Amps):	19.560	I_RMS (Amps):	13.320
I_Fund (Amps):	13.319	Crest Factor:	1.478
Power (Watts):	2921.3	Power Factor:	1.000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	1.080	N/A	0.008	1.620	N/A	Pass
3	0.016	2.300	0.7	0.023	3.450	0.7	Pass
4	0.003	0.430	N/A	0.004	0.645	N/A	Pass
5	0.020	1.140	1.8	0.024	1.710	1.4	Pass
6	0.001	0.300	N/A	0.002	0.450	N/A	Pass
7	0.019	0.770	2.5	0.024	1.155	2.1	Pass
8	0.001	0.230	N/A	0.002	0.345	N/A	Pass
9	0.016	0.400	4.0	0.019	0.600	3.1	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.014	0.330	4.2	0.016	0.495	3.3	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.014	0.210	6.7	0.016	0.315	5.2	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.014	0.150	9.2	0.016	0.225	7.0	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.010	0.132	7.2	0.011	0.198	5.4	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.009	0.118	7.2	0.010	0.178	5.7	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.007	0.107	N/A	0.008	0.161	N/A	Pass
22	0.001	0.084	N/A	0.001	0.125	N/A	Pass
23	0.008	0.098	8.2	0.008	0.147	5.6	Pass
24	0.001	0.077	N/A	0.001	0.115	N/A	Pass
25	0.005	0.090	N/A	0.005	0.135	N/A	Pass
26	0.001	0.071	N/A	0.001	0.107	N/A	Pass
27	0.004	0.083	N/A	0.005	0.125	N/A	Pass
28	0.001	0.066	N/A	0.001	0.099	N/A	Pass
29	0.003	0.078	N/A	0.004	0.116	N/A	Pass
30	0.001	0.061	N/A	0.001	0.092	N/A	Pass
31	0.003	0.073	N/A	0.003	0.109	N/A	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.002	0.068	N/A	0.003	0.102	N/A	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.002	0.064	N/A	0.002	0.096	N/A	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.002	0.061	N/A	0.003	0.091	N/A	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.001	0.058	N/A	0.002	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

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Voltage Source Verification Data (Phase A-Run time)

EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**
Measured source distortion is within the requirements of the standards
Measurements are compliant with IEC/EN61000-3-2 Ed. 5 & IEC/EN61000-4-7 Ed. 2.1

Highest parameter values during test:

Voltage (Vrms):	219.527	Frequency(Hz):	50.00
I_Peak (Amps):	19.560	I_RMS (Amps):	13.320
I_Fund (Amps):	13.319	Crest Factor:	1.478
Power (Watts):	2921.3	Power Factor:	1.000

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.126	0.439	28.67	OK
3	0.113	1.975	5.73	OK
4	0.051	0.439	11.73	OK
5	0.070	0.877	7.95	OK
6	0.030	0.439	6.93	OK
7	0.053	0.658	7.98	OK
8	0.026	0.439	6.03	OK
9	0.059	0.439	13.36	OK
10	0.018	0.439	4.21	OK
11	0.053	0.220	24.08	OK
12	0.016	0.219	7.21	OK
13	0.032	0.219	14.69	OK
14	0.017	0.219	7.87	OK
15	0.035	0.219	15.78	OK
16	0.010	0.219	4.54	OK
17	0.050	0.219	22.80	OK
18	0.011	0.219	5.04	OK
19	0.033	0.219	15.02	OK
20	0.010	0.219	4.76	OK
21	0.028	0.219	12.60	OK
22	0.009	0.219	4.19	OK
23	0.034	0.219	15.61	OK
24	0.010	0.219	4.47	OK
25	0.025	0.219	11.27	OK
26	0.010	0.219	4.36	OK
27	0.019	0.219	8.68	OK
28	0.010	0.219	4.38	OK
29	0.019	0.219	8.50	OK
30	0.009	0.219	4.09	OK
31	0.025	0.219	11.41	OK
32	0.010	0.219	4.64	OK
33	0.017	0.219	7.73	OK
34	0.010	0.219	4.62	OK
35	0.020	0.219	8.99	OK
36	0.010	0.219	4.33	OK
37	0.019	0.219	8.45	OK
38	0.010	0.219	4.57	OK
39	0.021	0.219	9.51	OK
40	0.010	0.219	4.70	OK

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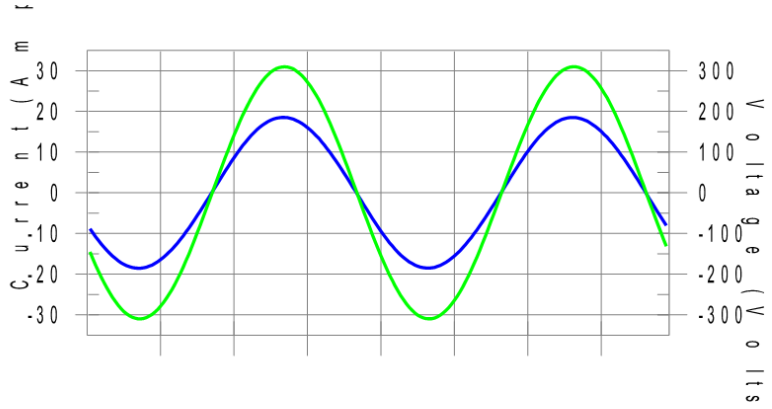
Harmonics – Class-A per Ed. 5.0 (2018)(Phase B-Run time)

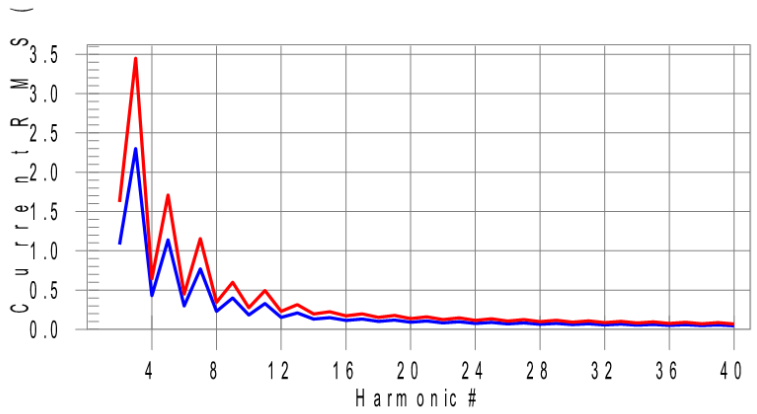
EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass **Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit.**

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Current Test Result Summary (Phase B-Run time)

EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**
THC(A): 0.011 **I-THD(%): 0.1** **POHC(A): 0.002** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	219.582	Frequency(Hz):	50.00
I_Peak (Amps):	18.693	I_RMS (Amps):	13.087
I_Fund (Amps):	13.082	Crest Factor:	1.435
Power (Watts):	2869.0	Power Factor:	1.000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	1.080	N/A	0.010	1.620	N/A	Pass
3	0.007	2.300	N/A	0.012	3.450	N/A	Pass
4	0.002	0.430	N/A	0.004	0.645	N/A	Pass
5	0.004	1.140	N/A	0.006	1.710	N/A	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.003	0.770	N/A	0.004	1.155	N/A	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.001	0.400	N/A	0.001	0.600	N/A	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.002	0.330	N/A	0.002	0.495	N/A	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.001	0.210	N/A	0.001	0.315	N/A	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.002	0.150	N/A	0.003	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.001	0.132	N/A	0.001	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.001	0.118	N/A	0.001	0.178	N/A	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.001	0.107	N/A	0.001	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.001	0.098	N/A	0.002	0.147	N/A	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.000	0.090	N/A	0.000	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.000	0.083	N/A	0.001	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.001	0.078	N/A	0.001	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.001	0.073	N/A	0.001	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.001	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.001	0.064	N/A	0.001	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.001	0.061	N/A	0.001	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

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Voltage Source Verification Data (Phase B-Run time)

EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**
Measured source distortion is within the requirements of the standards
Measurements are compliant with IEC/EN61000-3-2 Ed. 5 & IEC/EN61000-4-7 Ed. 2.1

Highest parameter values during test:

Voltage (Vrms):	219.582	Frequency(Hz):	50.00
I_Peak (Amps):	18.693	I_RMS (Amps):	13.087
I_Fund (Amps):	13.082	Crest Factor:	1.435
Power (Watts):	2869.0	Power Factor:	1.000

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.123	0.439	28.11	OK
3	0.110	1.975	5.59	OK
4	0.051	0.439	11.58	OK
5	0.061	0.878	6.98	OK
6	0.028	0.439	6.28	OK
7	0.068	0.658	10.41	OK
8	0.023	0.439	5.30	OK
9	0.027	0.439	6.10	OK
10	0.022	0.439	5.00	OK
11	0.039	0.219	17.97	OK
12	0.014	0.219	6.33	OK
13	0.020	0.219	9.06	OK
14	0.016	0.219	7.07	OK
15	0.048	0.219	21.99	OK
16	0.012	0.219	5.38	OK
17	0.021	0.219	9.66	OK
18	0.010	0.219	4.71	OK
19	0.024	0.219	10.73	OK
20	0.012	0.219	5.33	OK
21	0.028	0.219	12.64	OK
22	0.010	0.219	4.52	OK
23	0.033	0.219	14.90	OK
24	0.011	0.219	4.79	OK
25	0.010	0.219	4.41	OK
26	0.011	0.219	4.86	OK
27	0.015	0.219	6.88	OK
28	0.010	0.219	4.50	OK
29	0.022	0.219	10.05	OK
30	0.010	0.219	4.64	OK
31	0.020	0.219	9.01	OK
32	0.011	0.219	5.12	OK
33	0.017	0.219	7.59	OK
34	0.010	0.219	4.36	OK
35	0.016	0.219	7.13	OK
36	0.010	0.219	4.62	OK
37	0.018	0.219	8.19	OK
38	0.009	0.219	3.92	OK
39	0.018	0.220	8.22	OK
40	0.011	0.219	5.08	OK

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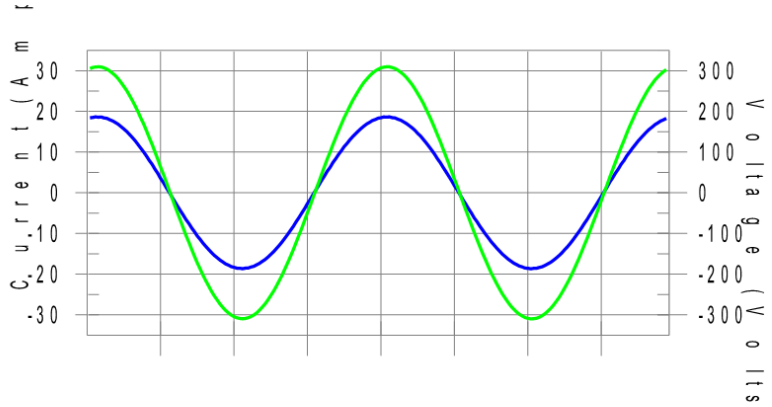
Harmonics – Class-A per Ed. 5.0 (2018)(Phase C-Run time)

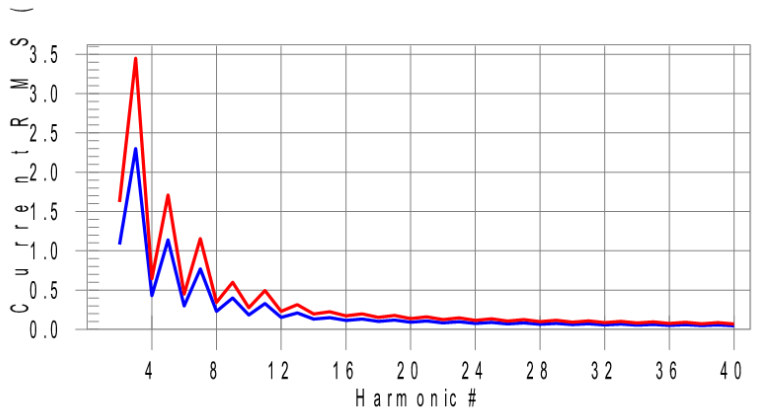
EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass **Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit.**

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Current Test Result Summary (Phase C-Run time)

EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**
THC(A): 0.009 **I-THD(%): 0.1** **POHC(A): 0.002** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	219.246	Frequency(Hz):	50.00
I_Peak (Amps):	18.891	I_RMS (Amps):	13.279
I_Fund (Amps):	13.279	Crest Factor:	1.430
Power (Watts):	2909.5	Power Factor:	1.000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	1.080	N/A	0.007	1.620	N/A	Pass
3	0.004	2.300	N/A	0.005	3.450	N/A	Pass
4	0.003	0.430	N/A	0.003	0.645	N/A	Pass
5	0.004	1.140	N/A	0.005	1.710	N/A	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.003	0.770	N/A	0.004	1.155	N/A	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.001	0.400	N/A	0.002	0.600	N/A	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.001	0.330	N/A	0.002	0.495	N/A	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.000	0.210	N/A	0.001	0.315	N/A	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.002	0.150	N/A	0.002	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.001	0.132	N/A	0.002	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.001	0.118	N/A	0.001	0.178	N/A	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.000	0.107	N/A	0.001	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.002	0.098	N/A	0.002	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.001	0.090	N/A	0.001	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.000	0.083	N/A	0.000	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.001	0.078	N/A	0.001	0.116	N/A	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.001	0.073	N/A	0.001	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.001	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.001	0.064	N/A	0.001	0.096	N/A	Pass
36	0.000	0.051	N/A	0.001	0.077	N/A	Pass
37	0.001	0.061	N/A	0.001	0.091	N/A	Pass
38	0.000	0.048	N/A	0.001	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.001	0.069	N/A	Pass

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Voltage Source Verification Data (Phase C-Run time)

EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:28:14** **End time: 14:38:27**
Test duration (min): 10 **Data file name: WIN2105_H-000087.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**
Measured source distortion is within the requirements of the standards
Measurements are compliant with IEC/EN61000-3-2 Ed. 5 & IEC/EN61000-4-7 Ed. 2.1

Highest parameter values during test:

Voltage (Vrms):	219.246	Frequency(Hz):	50.00
I_Peak (Amps):	18.891	I_RMS (Amps):	13.279
I_Fund (Amps):	13.279	Crest Factor:	1.430
Power (Watts):	2909.5	Power Factor:	1.000

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.116	0.438	26.54	OK
3	0.104	1.973	5.26	OK
4	0.050	0.438	11.45	OK
5	0.081	0.877	9.25	OK
6	0.019	0.438	4.28	OK
7	0.062	0.657	9.38	OK
8	0.022	0.438	4.97	OK
9	0.037	0.438	8.51	OK
10	0.017	0.438	3.87	OK
11	0.037	0.219	16.92	OK
12	0.014	0.219	6.17	OK
13	0.018	0.219	8.39	OK
14	0.014	0.219	6.26	OK
15	0.044	0.219	20.26	OK
16	0.011	0.219	5.15	OK
17	0.032	0.219	14.45	OK
18	0.012	0.219	5.33	OK
19	0.021	0.219	9.42	OK
20	0.013	0.219	6.00	OK
21	0.012	0.219	5.54	OK
22	0.009	0.219	4.29	OK
23	0.036	0.219	16.47	OK
24	0.009	0.219	4.08	OK
25	0.023	0.219	10.66	OK
26	0.012	0.219	5.63	OK
27	0.012	0.219	5.55	OK
28	0.010	0.219	4.63	OK
29	0.019	0.219	8.55	OK
30	0.010	0.219	4.56	OK
31	0.019	0.219	8.67	OK
32	0.008	0.219	3.79	OK
33	0.020	0.219	9.04	OK
34	0.014	0.219	6.28	OK
35	0.017	0.219	7.90	OK
36	0.011	0.219	4.90	OK
37	0.015	0.219	6.97	OK
38	0.010	0.219	4.62	OK
39	0.018	0.219	8.16	OK
40	0.010	0.219	4.39	OK

Appendix A.2: Test Results of Voltage Fluctuations and Flicker

AC mains port input

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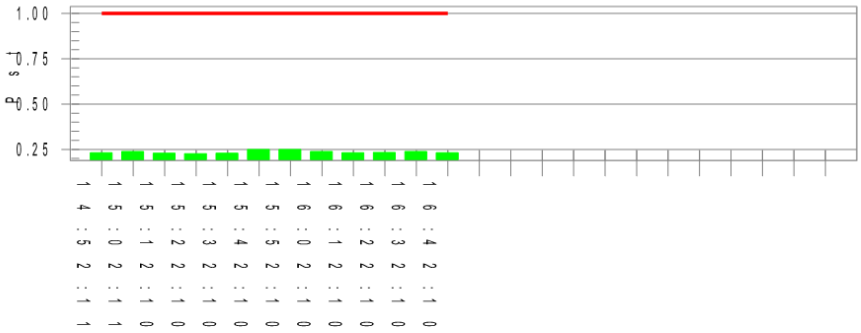
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Phase A-Run time)

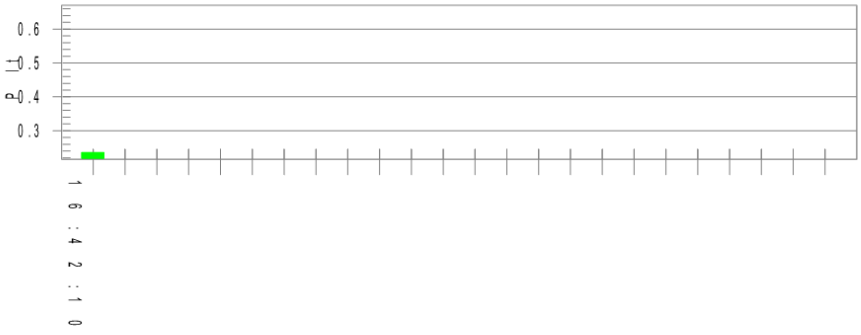
EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:41:48** **End time: 16:43:23**
Test duration (min): 120 **Data file name: WIN2105_F-000089.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Status: Test Completed**

Pst and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**216.35**			
T-max (mS):	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.25**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.250**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.236**	**Test limit:**	**0.650**	**Pass**

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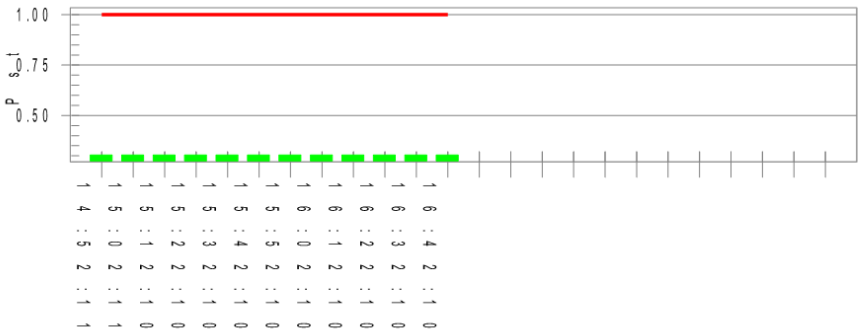
Flicker Test Summary per EN/IEC61000-3-3 (Phase B-Run time)Ed. 3.0 (2013)

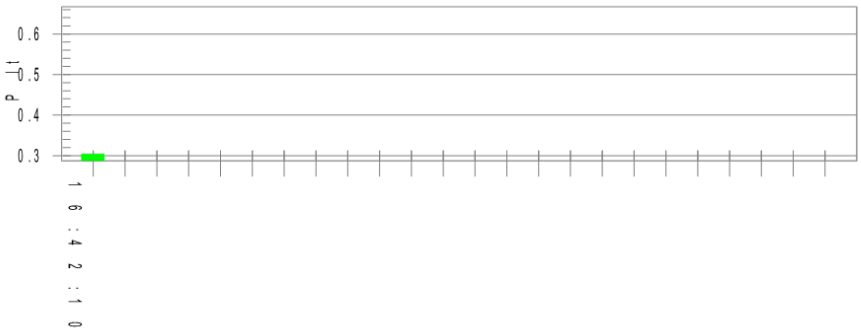
EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:41:48** **End time: 16:43:23**
Test duration (min): 120 **Data file name: WIN2105_F-000089.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**216.12**			
Tmax(mS):	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.22**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.304**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.304**	**Test limit:**	**0.650**	**Pass**

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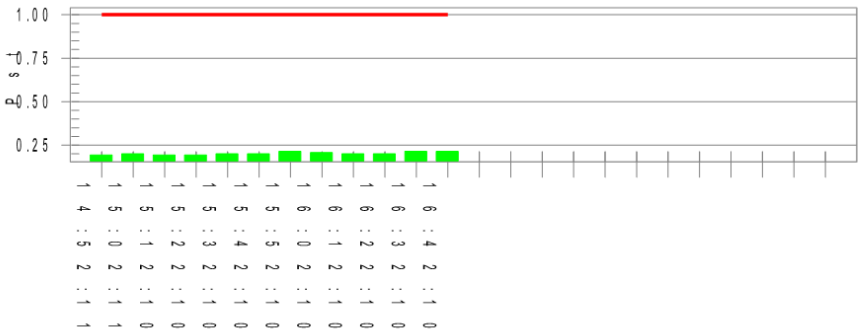
Flicker Test Summary per EN/IEC61000-3-3 (Phase C-Run time)Ed. 3.0 (2013)

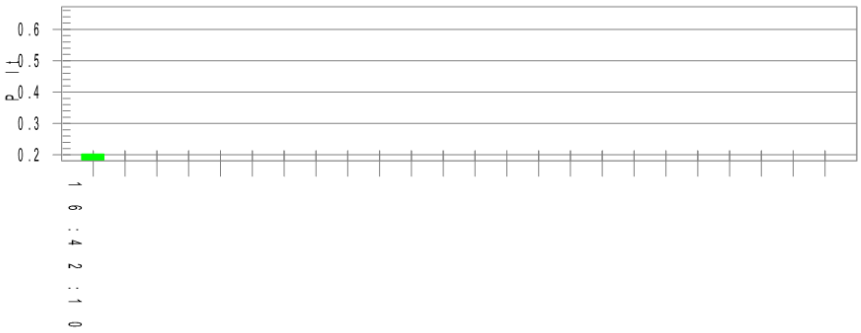
EUT: 11KW EV CHARGER ACO11E-01 **Tested by: Laiguiling**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2021/6/23 **Start time: 14:41:48** **End time: 16:43:23**
Test duration (min): 120 **Data file name: WIN2105_F-000089.cts_data**
Comment: 80% load
Customer: Customer information

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**215.94**			
Tmax(mS):	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.15**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.214**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.203**	**Test limit:**	**0.650**	**Pass**

Appendix A.3: Test Results of Radiated Emission, Below 1GHz

1 / 1

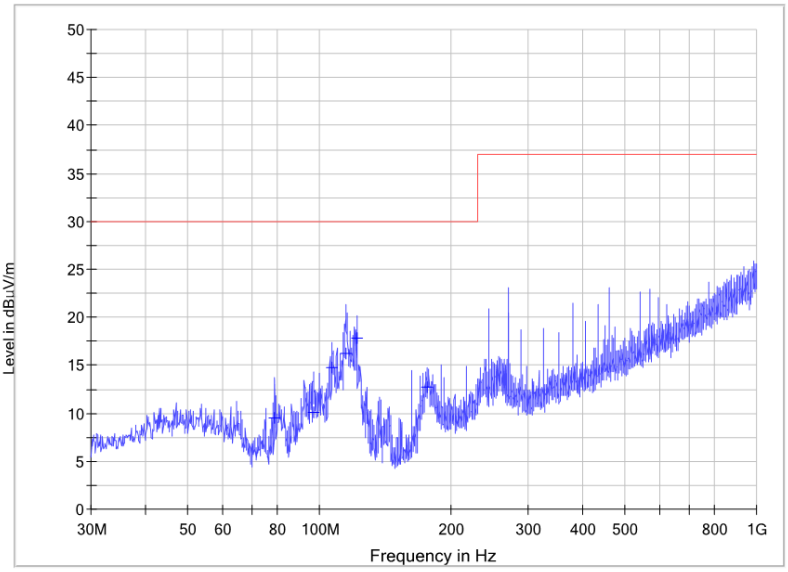
H 30MHz-1GHz

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V/m)
79.120000	9.48	20.0	120.000	400.0	H	297.0	-21.2	20.52	30.0
96.920000	10.10	20.0	120.000	400.0	H	128.0	-17.4	19.90	30.0
107.000000	14.80	20.0	120.000	400.0	H	156.0	-17.1	15.20	30.0
115.240000	16.30	20.0	120.000	400.0	H	108.0	-18.1	13.70	30.0
121.920000	17.86	20.0	120.000	400.0	H	318.0	-19.1	12.14	30.0
176.480000	12.72	20.0	120.000	400.0	H	87.0	-18.6	17.28	30.0



EMI Scan(10) 1 / 1

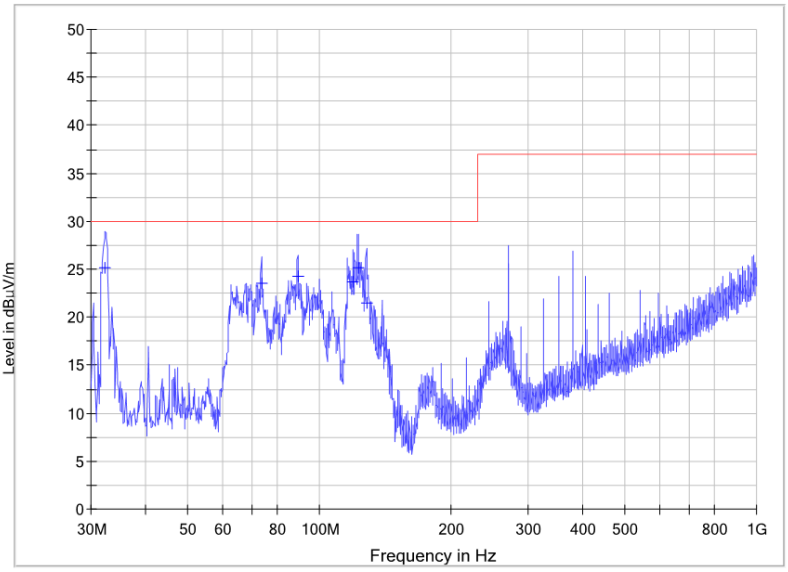
V 30MHz-1GHz

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V/m)
32.320000	25.12	20.0	120.000	100.0	V	58.0	-18.1	4.88	30.0
73.640000	23.50	20.0	120.000	100.0	V	48.0	-20.6	6.50	30.0
89.160000	24.26	20.0	120.000	100.0	V	179.0	-19.1	5.74	30.0
119.480000	23.65	20.0	120.000	100.0	V	26.0	-18.9	6.35	30.0
123.000000	25.21	20.0	120.000	100.0	V	341.0	-19.2	4.79	30.0
128.080000	21.56	20.0	120.000	100.0	V	163.0	-19.7	8.44	30.0



2021/6/21 EMC32 V9.25.0 17:10:03

EMI Scan(10) 1 / 1

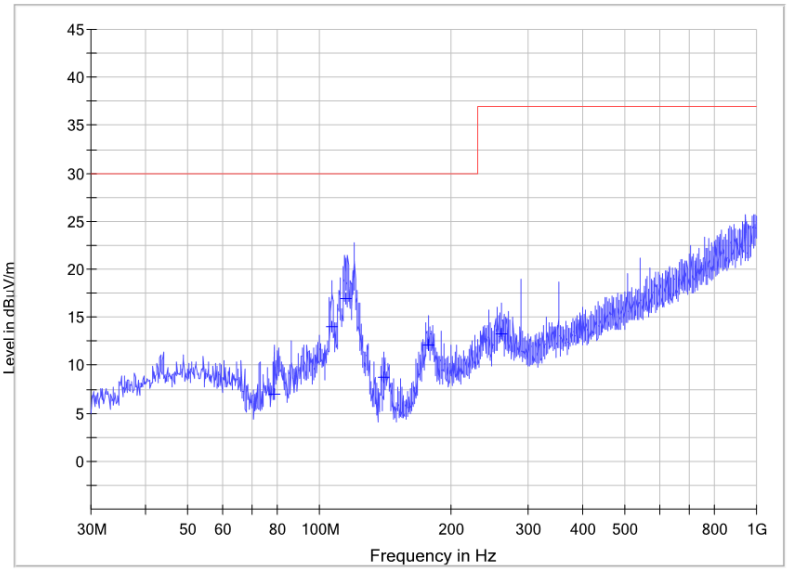
H 30MHz-1GHz

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V/m)
78.640000	7.02	20.0	120.000	400.0	H	71.0	-21.2	22.98	30.0
107.000000	14.02	20.0	120.000	400.0	H	198.0	-17.1	15.98	30.0
115.000000	16.89	20.0	120.000	400.0	H	9.0	-18.0	13.11	30.0
140.320000	8.78	20.0	120.000	400.0	H	20.0	-20.3	21.22	30.0
177.560000	12.11	20.0	120.000	400.0	H	9.0	-18.5	17.89	30.0
260.600000	13.32	20.0	120.000	400.0	H	81.0	-15.1	23.68	37.0



2021/6/21 EMC32 V9.25.0 17:30:19

EMI Scan(10) 1 / 1

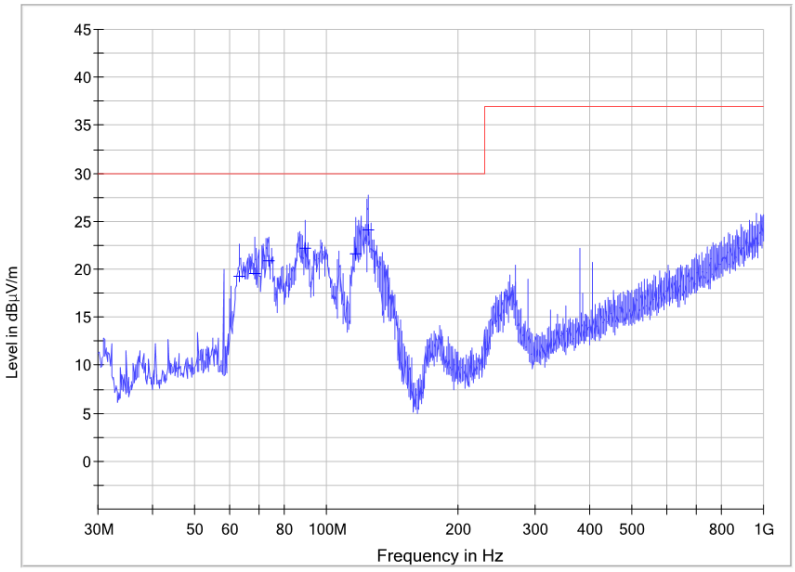
V 30MHz-1GHz

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V/m)
63.360000	19.23	20.0	120.000	100.0	V	328.0	-17.1	10.77	30.0
68.560000	19.57	20.0	120.000	100.0	V	95.0	-18.8	10.43	30.0
73.760000	20.83	20.0	120.000	100.0	V	97.0	-20.6	9.17	30.0
89.280000	22.24	20.0	120.000	100.0	V	231.0	-19.1	7.76	30.0
116.800000	21.62	20.0	120.000	100.0	V	321.0	-18.4	8.38	30.0
124.680000	24.16	20.0	120.000	100.0	V	199.0	-19.4	5.84	30.0



2021/6/21 EMC32 V9.25.0 17:39:22

Appendix A.4: Test Results of Radiated Emission, Above 1GHz

H 1-6GHz

1 / 1

Common Information

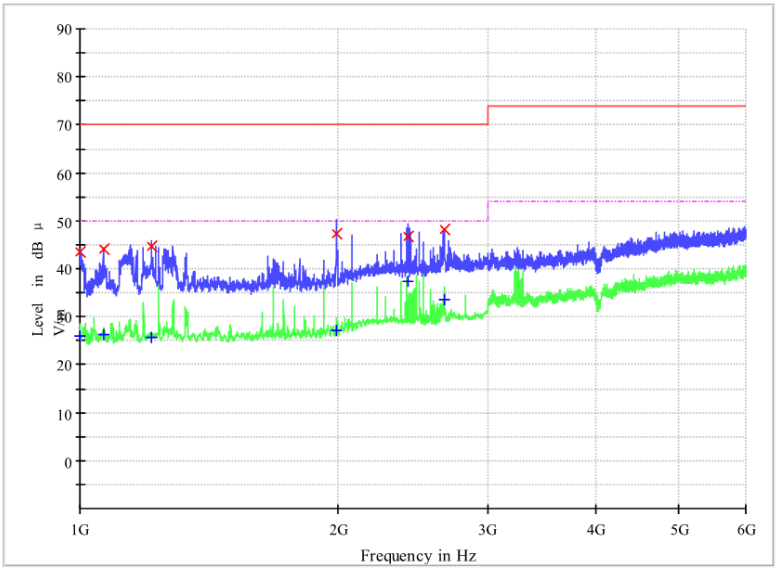
Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin PK

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dB µ
1001.200000	43.38	25.90	30.0	1000.000	155.0	H	-12.9	26.62	70.0
1064.400000	44.09	26.21	30.0	1000.000	155.0	H	-13.0	25.91	70.0
1213.600000	44.74	25.54	30.0	1000.000	155.0	H	-12.4	25.26	70.0
1996.800000	47.28	27.21	30.0	1000.000	155.0	H	-11.5	22.72	70.0
2421.200000	46.67	37.41	30.0	1000.000	155.0	H	-9.9	23.33	70.0
2662.000000	48.30	33.70	30.0	1000.000	155.0	H	-9.6	21.70	70.0

Limit and Margin AV

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB µ
1001.200000	43.38	25.90	30.0	1000.000	155.0	H	-12.9	24.10	50.0
1064.400000	44.09	26.21	30.0	1000.000	155.0	H	-13.0	23.79	50.0
1213.600000	44.74	25.54	30.0	1000.000	155.0	H	-12.4	24.46	50.0
1996.800000	47.28	27.21	30.0	1000.000	155.0	H	-11.5	22.79	50.0
2421.200000	46.67	37.41	30.0	1000.000	155.0	H	-9.9	12.59	50.0
2662.000000	48.30	33.70	30.0	1000.000	155.0	H	-9.6	16.30	50.0



2021/7/2 EMC32 V9.25.0 10:44:24

V 1-6GHz

1 / 1

Common Information

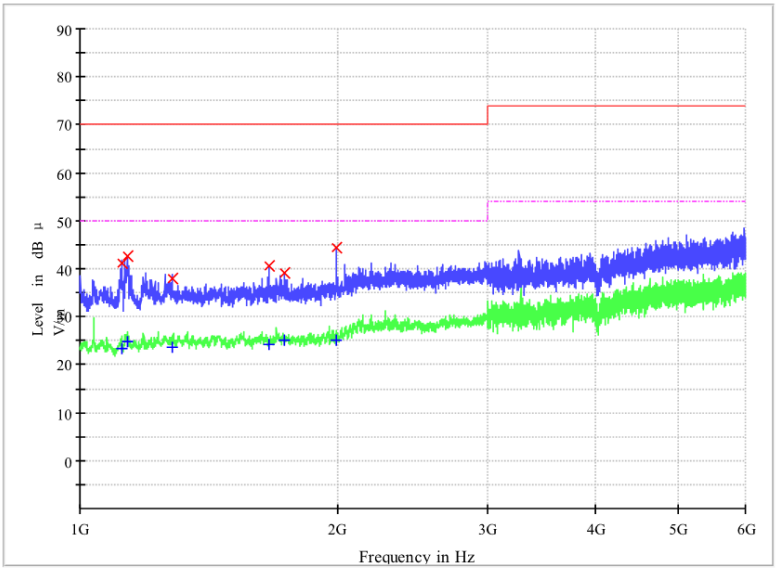
Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin PK

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dB µ
1119.200000	41.05	23.41	30.0	1000.000	155.0	V	-12.9	28.95	70.0
1134.800000	42.55	24.76	30.0	1000.000	155.0	V	-12.8	27.45	70.0
1283.200000	38.03	23.51	30.0	1000.000	155.0	V	-12.1	31.97	70.0
1662.000000	40.50	24.18	30.0	1000.000	155.0	V	-12.6	29.50	70.0
1735.600000	39.18	25.04	30.0	1000.000	155.0	V	-12.6	30.82	70.0
1992.000000	44.48	25.10	30.0	1000.000	155.0	V	-11.5	25.52	70.0

Limit and Margin AV

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB µ
1119.200000	41.05	23.41	30.0	1000.000	155.0	V	-12.9	26.59	50.0
1134.800000	42.55	24.76	30.0	1000.000	155.0	V	-12.8	25.24	50.0
1283.200000	38.03	23.51	30.0	1000.000	155.0	V	-12.1	26.49	50.0
1662.000000	40.50	24.18	30.0	1000.000	155.0	V	-12.6	25.82	50.0
1735.600000	39.18	25.04	30.0	1000.000	155.0	V	-12.6	24.96	50.0
1992.000000	44.48	25.10	30.0	1000.000	155.0	V	-11.5	24.90	50.0



EMI Sweep(12) 1 / 1

H 1-6GHz

Common Information

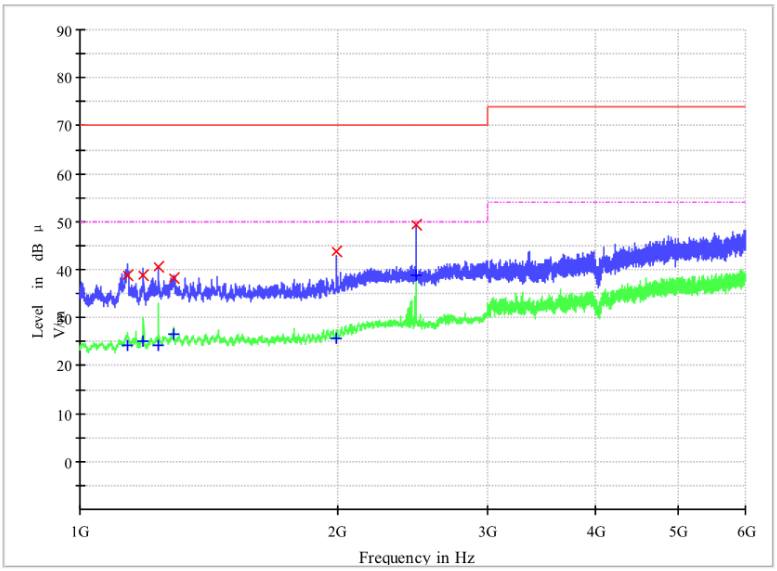
Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin PK

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dB µ
1136.400000	38.85	24.19	30.0	1000.000	155.0	H	-12.8	31.15	70.0
1186.400000	38.73	25.11	30.0	1000.000	155.0	H	-12.6	31.27	70.0
1236.400000	40.57	24.31	30.0	1000.000	155.0	H	-12.3	29.43	70.0
1289.200000	38.32	26.59	30.0	1000.000	155.0	H	-12.0	31.68	70.0
1995.600000	43.74	25.70	30.0	1000.000	155.0	H	-11.5	26.26	70.0
2470.800000	49.43	38.85	30.0	1000.000	155.0	H	-9.9	20.57	70.0

Limit and Margin AV

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB µ
1136.400000	38.85	24.19	30.0	1000.000	155.0	H	-12.8	25.81	50.0
1186.400000	38.73	25.11	30.0	1000.000	155.0	H	-12.6	24.89	50.0
1236.400000	40.57	24.31	30.0	1000.000	155.0	H	-12.3	25.69	50.0
1289.200000	38.32	26.59	30.0	1000.000	155.0	H	-12.0	23.41	50.0
1995.600000	43.74	25.70	30.0	1000.000	155.0	H	-11.5	24.30	50.0
2470.800000	49.43	38.85	30.0	1000.000	155.0	H	-9.9	11.15	50.0



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EMI Sweep(12) 1 / 1

V 1-6GHz

Common Information

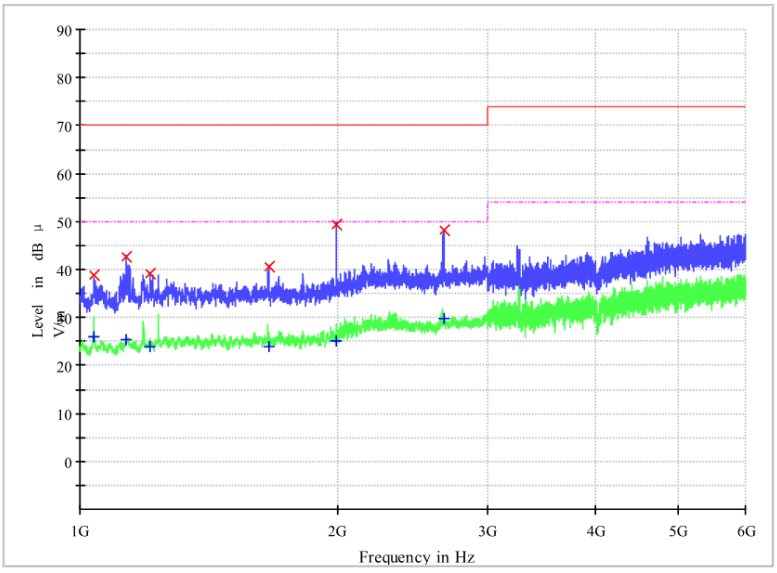
Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin PK

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dB µ
1038.000000	38.80	25.84	30.0	1000.000	155.0	V	-12.9	31.20	70.0
1132.400000	42.54	25.40	30.0	1000.000	155.0	V	-12.8	27.46	70.0
1206.400000	39.21	23.81	30.0	1000.000	155.0	V	-12.4	30.79	70.0
1663.600000	40.49	23.92	30.0	1000.000	155.0	V	-12.6	29.51	70.0
1994.800000	49.40	25.19	30.0	1000.000	155.0	V	-11.5	20.60	70.0
2662.000000	48.05	29.67	30.0	1000.000	155.0	V	-9.6	21.95	70.0

Limit and Margin AV

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB µ
1038.000000	38.80	25.84	30.0	1000.000	155.0	V	-12.9	24.16	50.0
1132.400000	42.54	25.40	30.0	1000.000	155.0	V	-12.8	24.60	50.0
1206.400000	39.21	23.81	30.0	1000.000	155.0	V	-12.4	26.19	50.0
1663.600000	40.49	23.92	30.0	1000.000	155.0	V	-12.6	26.08	50.0
1994.800000	49.40	25.19	30.0	1000.000	155.0	V	-11.5	24.81	50.0
2662.000000	48.05	29.67	30.0	1000.000	155.0	V	-9.6	20.33	50.0



Appendix A.5: Test Results of Conducted Emission

AC mains port input

EMI Scan(10) 1 / 1

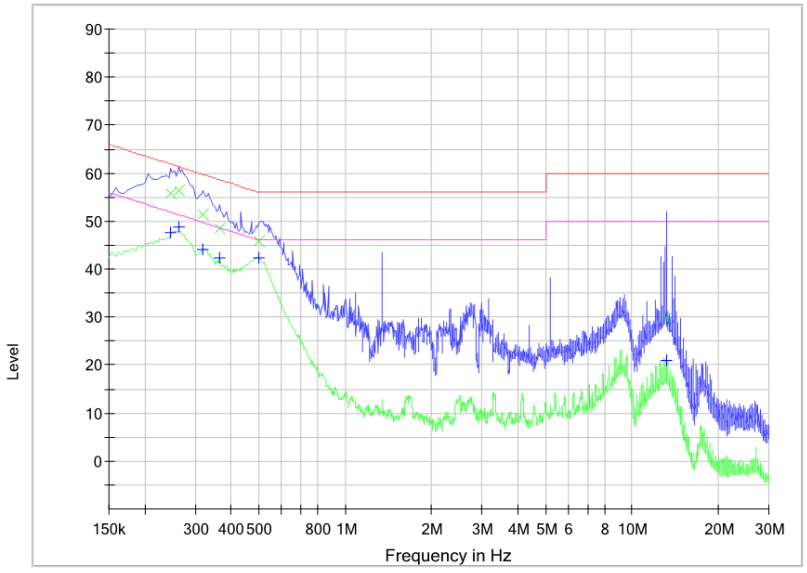
Input L1

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.246000	55.88	47.61	20.0	9.000	10.1	6.01	61.9	4.28	51.9
0.262000	56.31	48.75	20.0	9.000	10.1	5.06	61.4	2.62	51.4
0.318000	51.30	44.00	20.0	9.000	10.1	8.46	59.8	5.76	49.8
0.366000	48.57	42.33	20.0	9.000	10.1	10.02	58.6	6.26	48.6
0.498000	45.95	42.43	20.0	9.000	10.1	10.08	56.0	3.60	46.0
13.222000	29.84	21.08	20.0	9.000	10.5	30.16	60.0	28.92	50.0



2021/6/21 15:37:50

EMI Scan(10) 1 / 1

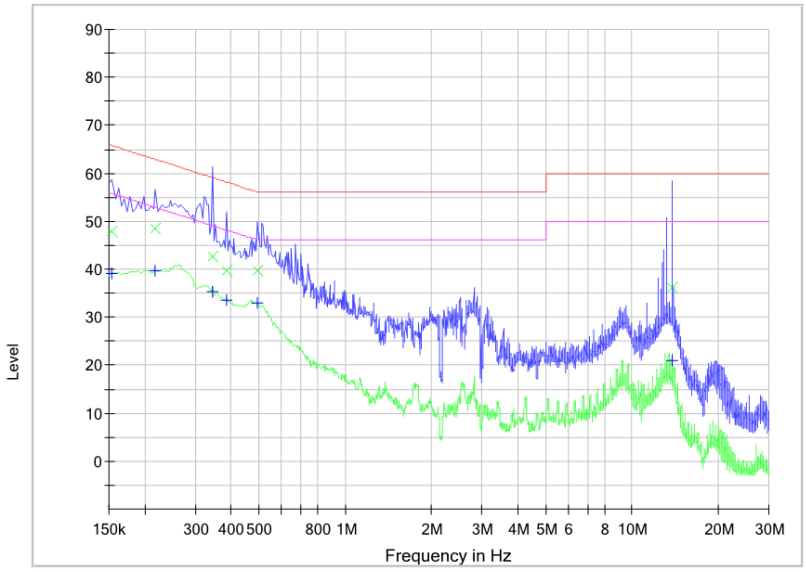
Input L2

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.154000	47.78	39.09	20.0	9.000	10.1	18.00	65.8	16.69	55.8
0.218000	48.48	39.78	20.0	9.000	10.1	14.41	62.9	13.11	52.9
0.346000	42.53	35.40	20.0	9.000	10.1	16.53	59.1	13.66	49.1
0.386000	39.65	33.54	20.0	9.000	10.1	18.50	58.1	14.61	48.1
0.494000	39.62	32.89	20.0	9.000	10.1	16.48	56.1	13.21	46.1
13.778000	36.12	20.86	20.0	9.000	10.5	23.88	60.0	29.14	50.0



2021/6/21 15:55:54

EMI Scan(10) 1 / 1

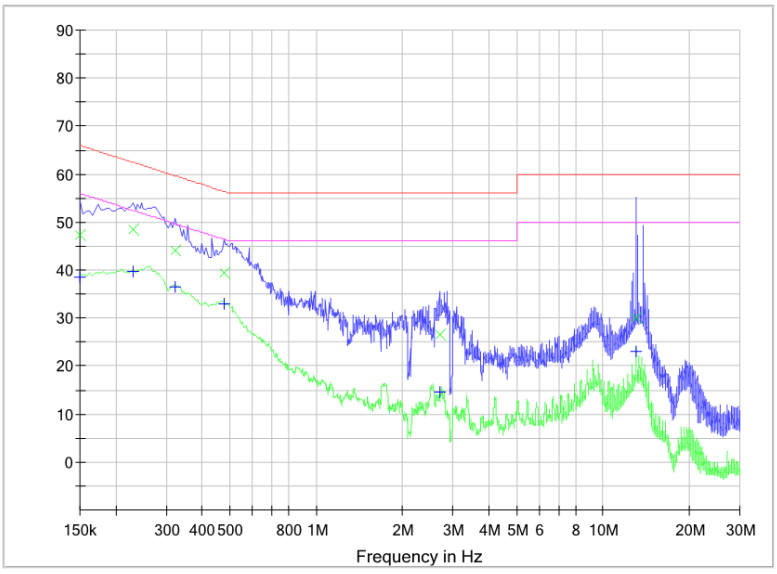
Input L3

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.150000	47.39	38.64	20.0	9.000	10.1	18.61	66.0	17.36	56.0
0.230000	48.45	39.58	20.0	9.000	10.1	14.00	62.4	12.87	52.4
0.322000	44.23	36.58	20.0	9.000	10.1	15.43	59.7	13.08	49.7
0.478000	39.45	33.10	20.0	9.000	10.1	16.92	56.4	13.27	46.4
2.690000	26.56	14.58	20.0	9.000	10.2	29.44	56.0	31.42	46.0
13.002000	29.96	23.02	20.0	9.000	10.5	30.04	60.0	26.98	50.0



2021/6/21 16:01:55

EMI Scan(10) 1 / 1

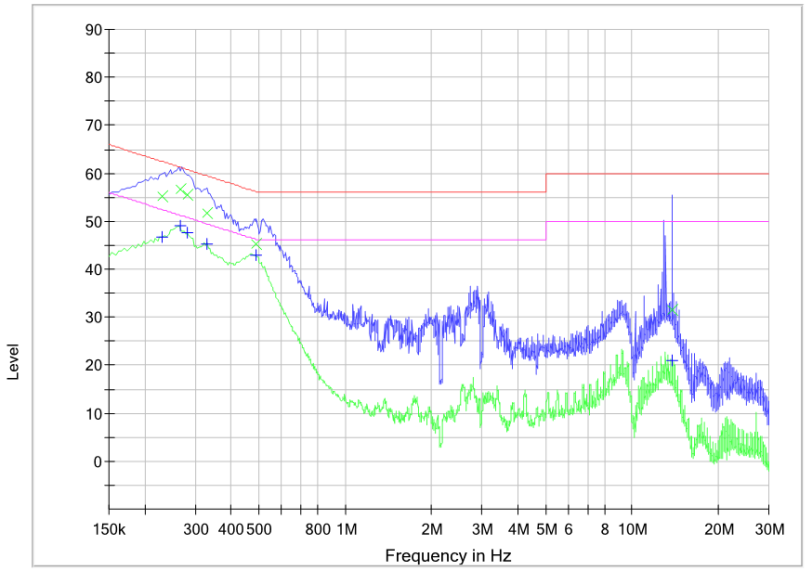
Input N

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.230000	55.29	46.76	20.0	9.000	10.1	7.16	62.4	5.69	52.4
0.266000	56.62	49.11	20.0	9.000	10.1	4.62	61.2	2.13	51.2
0.282000	55.63	47.58	20.0	9.000	10.1	5.13	60.8	3.18	50.8
0.330000	51.80	45.23	20.0	9.000	10.1	7.65	59.5	4.22	49.5
0.490000	45.38	42.90	20.0	9.000	10.1	10.79	56.2	3.27	46.2
13.766000	31.61	21.11	20.0	9.000	10.5	28.39	60.0	28.89	50.0



2021/6/21 16:07:37

EMI Scan(10) 1 / 1

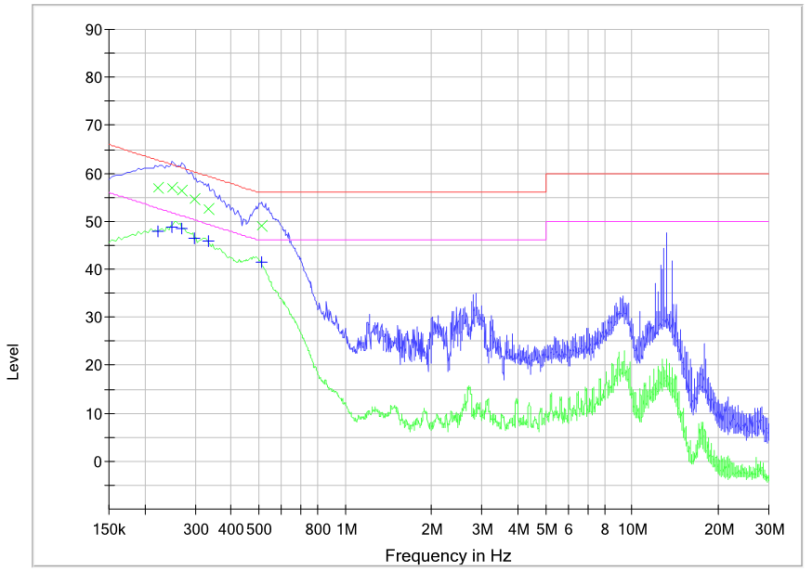
Input L1

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.222000	56.96	47.80	20.0	9.000	10.1	5.78	62.7	4.94	52.7
0.250000	57.07	48.75	20.0	9.000	10.1	4.69	61.8	3.01	51.8
0.270000	56.51	48.44	20.0	9.000	10.1	4.61	61.1	2.68	51.1
0.298000	54.72	46.53	20.0	9.000	10.1	5.58	60.3	3.77	50.3
0.334000	52.66	45.83	20.0	9.000	10.1	6.69	59.4	3.52	49.4
0.514000	48.94	41.60	20.0	9.000	10.1	7.06	56.0	4.40	46.0



2021/6/21 16:19:05

EMI Scan(10) 1 / 1

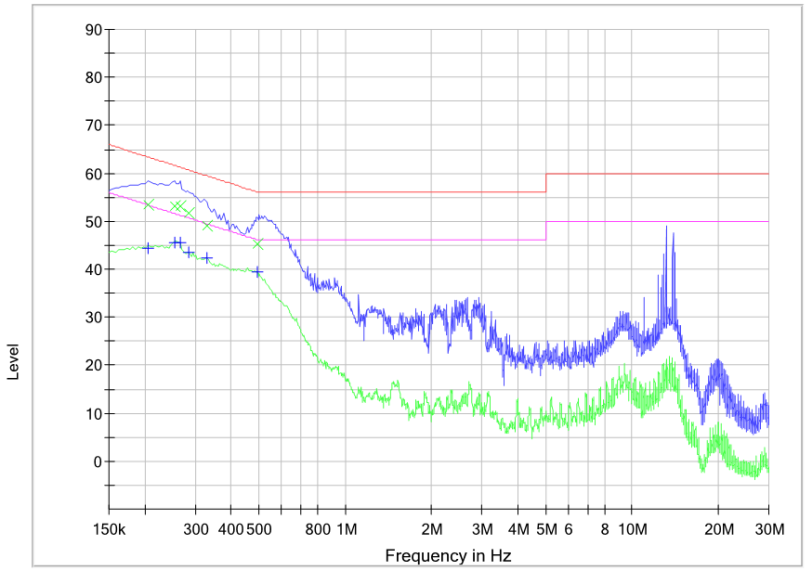
Input L2

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.206000	53.47	44.51	20.0	9.000	10.1	9.90	63.4	8.86	53.4
0.254000	53.25	45.56	20.0	9.000	10.1	8.38	61.6	6.07	51.6
0.266000	53.10	45.42	20.0	9.000	10.1	8.14	61.2	5.82	51.2
0.286000	51.58	43.38	20.0	9.000	10.1	9.06	60.6	7.26	50.6
0.330000	49.15	42.37	20.0	9.000	10.1	10.30	59.5	7.08	49.5
0.494000	45.39	39.31	20.0	9.000	10.1	10.71	56.1	6.79	46.1



2021/6/21 16:25:14

EMI Scan(10) 1 / 1

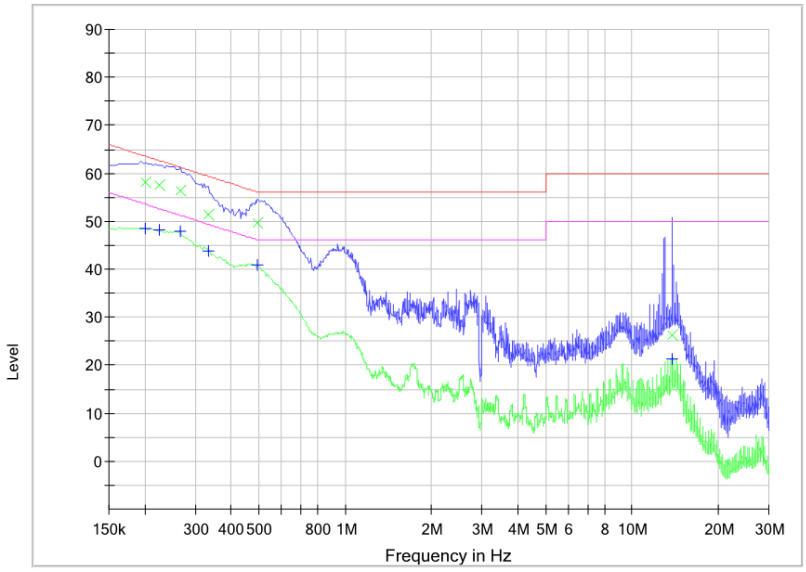
Input L3

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.202000	58.04	48.55	20.0	9.000	10.1	5.49	63.5	4.98	53.5
0.226000	57.51	48.06	20.0	9.000	10.1	5.09	62.6	4.54	52.6
0.266000	56.41	47.82	20.0	9.000	10.1	4.83	61.2	3.42	51.2
0.334000	51.49	43.89	20.0	9.000	10.1	7.86	59.4	5.46	49.4
0.494000	49.61	40.95	20.0	9.000	10.1	6.49	56.1	5.15	46.1
13.842000	26.36	21.30	20.0	9.000	10.5	33.64	60.0	28.70	50.0



2021/6/21 16:30:31

EMI Scan(10) 1 / 1

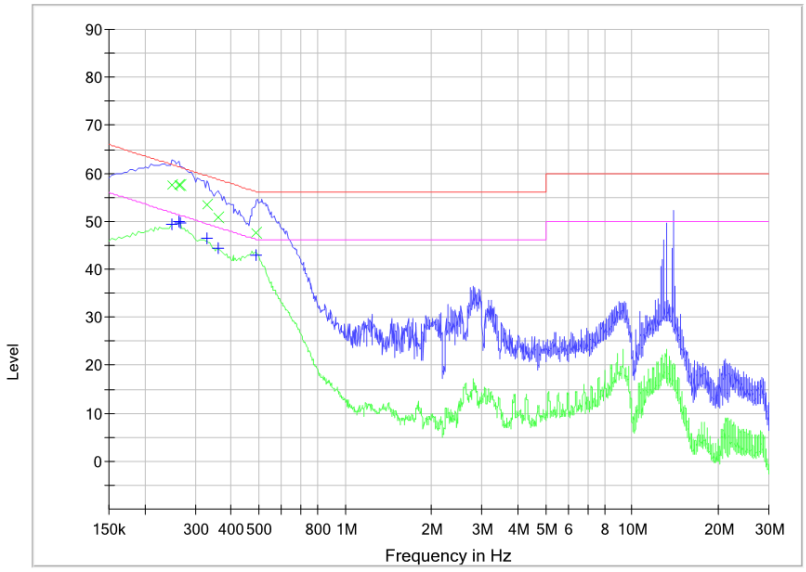
Input N

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	80% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.250000	57.54	49.41	20.0	9.000	10.1	4.22	61.8	2.35	51.8
0.262000	57.66	49.81	20.0	9.000	10.1	3.71	61.4	1.56	51.4
0.266000	57.60	49.79	20.0	9.000	10.1	3.64	61.2	1.45	51.2
0.330000	53.41	46.45	20.0	9.000	10.1	6.04	59.5	3.00	49.5
0.362000	50.94	44.27	20.0	9.000	10.1	7.74	58.7	4.41	48.7
0.490000	47.66	42.86	20.0	9.000	10.1	8.51	56.2	3.31	46.2



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Signal port

EMI Scan(11) 1 / 1

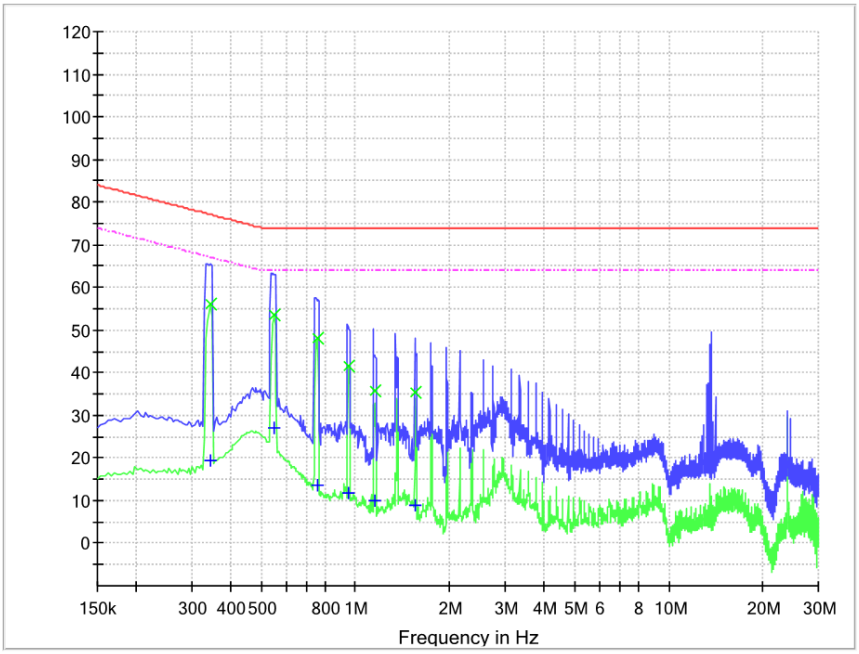
Communication port

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.346000	56.2	19.6	20.0	9.000	10.1	20.9	77.1	47.5	67.1
0.550000	53.5	27.2	20.0	9.000	10.1	20.5	74.0	36.8	64.0
0.754000	48.2	13.7	20.0	9.000	10.1	25.8	74.0	50.4	64.0
0.954000	41.6	11.9	20.0	9.000	10.1	32.4	74.0	52.1	64.0
1.154000	35.7	10.0	20.0	9.000	10.1	38.3	74.0	54.0	64.0
1.554000	35.4	8.9	20.0	9.000	10.1	38.6	74.0	55.1	64.0



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EMI Scan(11) 1 / 1

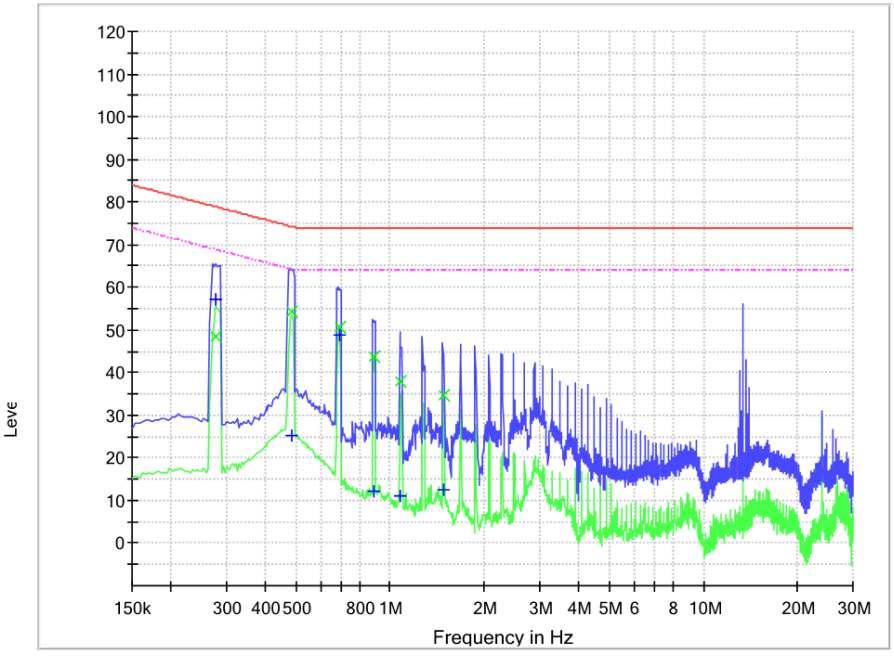
Communication port

Common Information

Product Name:	11kW EV Charger
Model Name:	AC011E-01
Operating Conditions:	20% load
Test Voltage:	AC 400V/50Hz
Operator Name:	Xiao Yun
Remark:	

Limit and Margin

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB µ V)	Margin - AVG (dB)	Limit - AVG (dB µ V)
0.278000	48.5	57.3	20.0	9.000	10.1	30.4	78.9	11.6	68.9
0.486000	54.4	25.3	20.0	9.000	10.1	19.8	74.2	39.0	64.2
0.690000	50.8	48.8	20.0	9.000	10.1	23.2	74.0	15.2	64.0
0.890000	43.7	12.0	20.0	9.000	10.1	30.3	74.0	52.0	64.0
1.078000	38.1	11.0	20.0	9.000	10.1	35.9	74.0	53.0	64.0
1.482000	34.7	12.7	20.0	9.000	10.1	39.3	74.0	51.3	64.0



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