



中国认可
国际互认
检测
TESTING
CNAS L5313

-page 1 of 53-



1992142E-ISM-CE-P05V01

Grid-Connected PV Inverter

Models: EA20KTSI,EA25KTSI,EA30KTSI

Suzhou, date of issue: 2019-11-04

Author: Ranger Chen

By order of EAST Group Co., Ltd.

Ranger Chen

Jerry Pan

author : Ranger Chen
DEKRA Testing and Certification (Suzhou) Co., Ltd.

reviewed : Jerry Pan

CONTENTS

1	Conclusion	3
1.1	Model description	3
2	Summary	5
2.1	Applied standards	5
2.2	Overview of results.....	5
3	General Information	6
3.1	Customer Information.....	6
3.2	Test data.....	7
3.3	Environmental conditions	7
3.4	Measurement Uncertainty	8
3.5	Equipment List	10
4	Emission test results	14
4.1	Conducted Emissions (Telecommunication Ports)	23
4.2	Radiated Emission	24
4.3	Harmonic current emissions.....	27
4.4	Voltage fluctuations and flicker.....	34
5	Immunity test results	35
5.1	Electrostatic discharge immunity	35
5.2	Radio frequency electromagnetic field.....	39
5.3	Fast transients common mode	41
5.4	Surge	43
5.5	Radio frequency common mode.....	45
5.6	Power-frequency magnetic field	47
6	Identification of the equipment under test.....	48

1 CONCLUSION

The conclusion and results stated in this test report are based on a non-recurrent examination of sample(s) provided by the applicant.

The tests described in this report do not result in the right to use any approval mark as conferred by DEKRA. As far as the tests were based on certain specifications, these are mentioned in the report.

1.1 Model description

The apparatus as supplied for the test is Grid-Connected PV Inverter , models EA20KTSI, EA25KTSI, EA30KTSI.

According to the declaration from manufacturer, all the models are identical except for the power.



Figure 1 Overview



Figure 2 Overview



Figure 3 Overview

2 SUMMARY

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

2.1 Applied standards

Standard	Year	Title
EN 61000-6-4	2007	Generic standards — Emission standard for industrial environments
A1	2011	
EN 61000-6-2	2005	Generic standards — Immunity for industrial environments

Standard	Year	Title
EN 61000-6-3	2007	Generic standards — Emission standard for residential, commercial and light-industrial environments
A1	2011	
AC	2012	
EN 61000-6-1	2007	Generic standards — Immunity for residential, commercial and light-industrial environments

Note: The test in this report uses the lower limit (EN 61000-6-3) for Emission, uses the higher level (EN 61000-6-2) for Immunity. Use EN 61000-6-1 and EN 61000-6-2 for Voltage dips and interruptions.

2.2 Overview of results

Emission tests	Result
Conducted Emission(Mains Ports)	PASS
Conducted Emission(Telecommunication Ports)	N/A
Radiated Emission	PASS
Harmonic current emission	PASS
Voltage fluctuations and flicker	PASS

Immunity tests	Result
Electrostatic discharge	PASS
Radio frequency electromagnetic field	PASS
Electrical fast transients	PASS
Surges	PASS
Radio-frequency continuous conducted	PASS
Power frequency magnetic field	PASS
Voltage dips and interruptions	PASS

3 GENERAL INFORMATION

Equipment under test	Grid-Connected PV Inverter
Trade Mark	EAST
Types	EA20KTSI,EA25KTSI,EA30KTSI
Ratings	Input: max 1100 Vdc, MPPT voltage range: 200-950 Vdc, Output: 230/400 Vac, 3/N/PE, 50/60 Hz, 20000 W / 25000 W / 30000 W

3.1 Customer Information

Applicant	EAST Group Co., Ltd.
Address	No.6 Northern Industry Road, Songshan Lake Sci. & Tech. Industrial Park, Dongguan City, Guangdong Province, China

Manufacturer	EAST Group Co., Ltd.
Address	No.6 Northern Industry Road, Songshan Lake Sci. & Tech. Industrial Park, Dongguan City, Guangdong Province, China

Factory	EAST Group Co., Ltd.
Address	No.6 Northern Industry Road, Songshan Lake Sci. & Tech. Industrial Park, Dongguan City, Guangdong Province, China

3.2 Test data

Location	DEKRA Testing & Certification (Suzhou) Co., Ltd.
Address	No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006, Jiangsu, China
Date of receipt of test item	Sep. 2019 (samples provided by applicant)
Date (s) of performance of tests	Oct. 2019
Supervised by	Jerry Pan

3.3 Environmental conditions

Tests have been performed in a controlled laboratory environment, where the environmental conditions are maintained within the applicable ranges.

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

3.4 Measurement Uncertainty

Conducted Emission (Mains Ports) / TR1
The maximum measurement uncertainty is evaluated as: Mains: 9kHz~150kHz: 2.80dB 150kHz~30MHz: 2.40dB
Conducted Emission (Telecommunication Ports) / TR1
The maximum measurement uncertainty is evaluated as: ISN T800: 150kHz~30MHz: 3.60 dB ISN T8-Cat6: 150kHz~30MHz: 3.50 dB ISN ST08: 150kHz~30MHz: 3.10 dB
Radiated emission / AC1
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~300MHz: 3.50 dB 300MHz~1GHz: 3.20 dB 1GHz~18GHz: 4.80 dB Vertical: 30MHz~300MHz: 3.60 dB 300MHz~1GHz: 3.10 dB 1GHz~18GHz: 4.50 dB
Radiated emission / AC5
The maximum measurement uncertainty is evaluated as: Horizontal: 30MHz~300MHz: 3.90 dB 300MHz~1GHz: 3.60 dB 1GHz~18GHz: 5.00 dB Vertical: 30MHz~300MHz: 3.80 dB 300MHz~1GHz: 3.50 dB 1GHz~18GHz: 4.80 dB
Harmonic current emissions / TR20
The maximum measurement uncertainty is evaluated as: 1.8 %.
Voltage fluctuation and flicker / TR20
The maximum measurement uncertainty is evaluated as: 1.5 %.
Electrostatic discharge / AC4
The maximum measurement uncertainty is evaluated as Rise Time: 6.4 %, Peak Current: 6 %, Current at 30 ns: 6 %, Current at 60 ns: 6 %.
Radio frequency electromagnetic field / AC4
The maximum measurement uncertainty is evaluated as 1.48dB.
Electrical fast transients / TR2
The maximum measurement uncertainty is evaluated as Voltage: 4%, Time: 2%.

Surges / TR2
The maximum measurement uncertainty is evaluated as Voltage: 4%, Time: 2%.
Radio-frequency continuous conducted / TR2
The maximum measurement uncertainty is evaluated as CDN: 1.52dB, EM Clamp: 1.92dB.
Power-frequency magnetic field / TR20
The maximum measurement uncertainty is evaluated as 10%.
Voltage dips and interruptions / TR20
The maximum measurement uncertainty is evaluated as Voltage: 4%, Time: 2%.

3.5 Equipment List

Conducted Emission(Mains Ports)/ TR1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100906	2020.04.20
Two-Line V-Network	R&S	ENV216	101189	2019. 11.24
Two-Line V-Network	R&S	ENV216	101044	2020.06.09
Artificial Mains Network	SCHWARZBECK	NSLK 8128	8128-287	2020.10.20
Current Probe	R&S	EZ-17	100678	2020.03.07
50ohm Termination	SHX	TF2	07081402	2020.09.08
50ohm Termination	SHX	TF2	07081403	2020.09.08
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A
Coaxial Cable	Suhner	RG 223	TR1-C1	2020.09.27
Temperature/Humidity Meter	ruitesi	RTS-8S	TR1-TH	2020.09.27

Conducted Emission (Telecommunication Ports) / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100906	2020.03.04
Two-Line V-Network	R&S	ENV216	101189	2020.06.09
Two-Line V-Network	R&S	ENV216	101044	2020.06.09
Impedance Stabilization Network	Teseq GmbH	ISN T800	30306	2020.01.22
Impedance Stabilization Network	Teseq GmbH	ISN T8-Cat6	29680	2020.01.22
Current Probe	R&S	EZ-17	100678	2020.09.08
50ohm Termination	SHX	TF2	07081402	2020.09.08
50ohm Termination	SHX	TF2	07081403	N/A
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2020.09.27
Coaxial Cable	Suhner	RG 223	TR1-C1	2020.09.27
Temperature/Humidity Meter	ruitesi	RTS-8S	TR1-TH	2020.10.24

Radiated Emission / AC1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100175	2020.09.08
EMI Test Receiver	R&S	ESCI	100726	2020.09.08
EMI Receiver	Agilent	N9038A	MY51210196	2020.06.09
Preamplifier	Quietek	AP-025C	CHM-0602008	2020.04.13
Preamplifier	Quietek	AP-025C	CHM-0503006	2020.04.13
Bilog Antenna	Schaffner	CBL6112B	2931	2020.05.18
Bilog Antenna	Schaffner	CBL6112B	2933	2020.05.18
DRG Horn Antenna	ETS-Lindgren	3117	00167055	2020.06.09
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-L	2020.10.10
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-R	2020.10.10
Temperature/Humidity Meter	ruitesi	RTS-8S	AC1-TH	2020.10.24

Radiated disturbance / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Receiver	Agilent	N9038A	MY51210196	2020.06.09
Preamplifier	Miteq	NSP1800-25	1364185	2020.07.16
DRG Horn Antenna	ETS-Lindgren	3117	00167055	2020.06.09
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2020.02.28
Temperature/Humidity Meter	ruitesi	RTS-8S	AC5-TH	2020.10.24

Harmonic current emissions / TR20

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Proflin 2145 Harmonics & Flicker and power line immunity test system	Teseq GmbH	Proflin 2145	1736A02510, 1646A, 01490, 1736A02428, 1736A00944, A41547	2020.09.08
Temperature/Humidity Meter	ruitesi	RTS-8S	TR20-TH	2020.10.24

Voltage fluctuation and flicker / TR20

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Proflin 2145 Harmonics & Flicker and power line immunity test system	Teseq GmbH	Proflin 2145	1736A02510, 1646A, 01490, 1736A02428, 1736A00944, A41547	2020.09.08
Temperature/Humidity Meter	ruitesi	RTS-8S	TR20-TH	2020.10.24

Electrostatic discharge / AC4

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
ESD Simulator	EM TEST	Dito	V0616101367	2019.12.12
Barometer	Fengyun	DYM3	506048	2020.10.23
Temperature/Humidity Meter	ruitesi	RTS-8S	TR3-TH	2020.10.24

Radio-frequency electromagnetic field / AC4

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Signal Generator	Keysight	N5171B	MY53051907	2020.10.20
Power Meter	Agilent	E4416A	GB41293844	2020.10.20
Power Sensor	Agilent	E9323A	MY44420302	2020.10.20
Power Meter	Boonton	4231A	144502	2020.10.20
Power Sensor	Boonton	51011-EMC	33859	2019.11.15
RF Switch	MF	SW1072	RFSW980005	2020.01.24
Power Amplifier	rflight	NTWPAS-103050	16033031	2020.01.24
Power Amplifier	rflight	NTWPAS-00810250E	16033039	2020.01.24

Directional Coupler	Schaffner	CHA 9652B	121	N/A
Directional Coupler	A&R	DC7144A	312249	N/A
Electric Field Probe	ETS-LINDGREN	HI-6105	00114789	2020.09.19
Bilog Antenna	Schaffner	CBL6141A	4278	2020.10.24
Horn Antenna	A&R	AT4002A	312312	2020.10.20
Temperature/Humidity Meter	ruitesi	RTS-8S	AC4-TH	2020.10.20

Electrical fast transients / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Immunity Test System	Teseq GmbH	NSG 3060	4019	2020.09.03
CDN	Teseq GmbH	CDN 3061	5010	2020.09.03
Automatic Step transformer	Teseq GmbH	VAR 3005-S16	3010	2020.04.20
CDN	Teseq GmbH	CDN 3063	1997	2020.03.27
CDN	Teseq GmbH	CDN 3425	2029	2020.10.20
Temperature/Humidity Meter	ruitesi	RTS-8S	TR2-TH	2020.10.24

Surges / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Immunity Test System	Teseq GmbH	NSG 3060	4019	2020.09.03
CDN	Teseq GmbH	CDN 3061	5010	2020.09.03
Automatic Step transformer	Teseq GmbH	VAR 3005-S16	3010	2020.04.20
CDN	Teseq GmbH	CDN 3063	1997	2020.03.27
CDN	Teseq GmbH	CDN 118	40652	2020.10.20
CDN	Teseq GmbH	CDN 118	40644	2020.10.20
CDN	Teseq GmbH	CDN 117	31806	2020.03.04
Temperature/Humidity Meter	ruitesi	RTS-8S	TR2-TH	2020.10.24

Radio-frequency continuous conducted / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
RF-Generator	Teseq GmbH	NSG 4070B-80	43711	2020.06.09
Attenuation	Teseq GmbH	ATN 6050	33651	2020.04.13
Coupling / Decoupling Network	Schaffner	CDN M016	21249	2020.10.20
Coupling / Decoupling Network	Teseq GmbH	CDN M016	24484	2020.10.20
Coupling / Decoupling Network	Schaffner	CDN T400	19083	2020.10.20
Coupling / Decoupling Network	Teseq GmbH	CDN T400	22461	2020.01.07
Coupling / Decoupling Network	Teseq GmbH	CDN T800	26167	2020.03.04
Coupling / Decoupling Network	EM TEST	CDN M5	P1620179992	2020.11.02

EM Clamp	Schaffner	KEMZ 801	21041	2020.10.24
Temperature/Humidity Meter	ruitesi	RTS-8S	TR2-TH	2020.06.09

Power-frequency magnetic field / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Immunity Test System	Teseq GmbH	NSG 3060	4019	2020.09.03
CDN	Teseq GmbH	CDN 3061	5010	2020.09.03
Automatic Step transformer	Teseq GmbH	VAR 3005-S16	3010	2020.04.20
Magnetic field Coil	Teseq GmbH	INA 702	306	2020.07.20
Magnetic Field Generator	Teseq GmbH	MFO 6502	201	2020.07.20
Temperature/Humidity Meter	RTS	RTS-8S	TR2-TH	2020.10.24

Voltage dips and interruptions / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Immunity Test System	Teseq GmbH	NSG 3060	4019	2020.09.03
CDN	Teseq GmbH	CDN 3061	5010	2020.09.03
Automatic Step transformer	Teseq GmbH	VAR 3005-S16	3010	2020.04.20
Temperature/Humidity Meter	RTS	RTS-8S	TR2-TH	2020.10.24

4 EMISSION TEST RESULTS

Conducted emission (Main Ports)

Limits of conducted emission for AC mains power input/output ports		
Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

NOTE 1: The lower limit shall apply at the transition frequencies.
 NOTE 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

Limits of conducted emission for DC power input/output ports		
Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

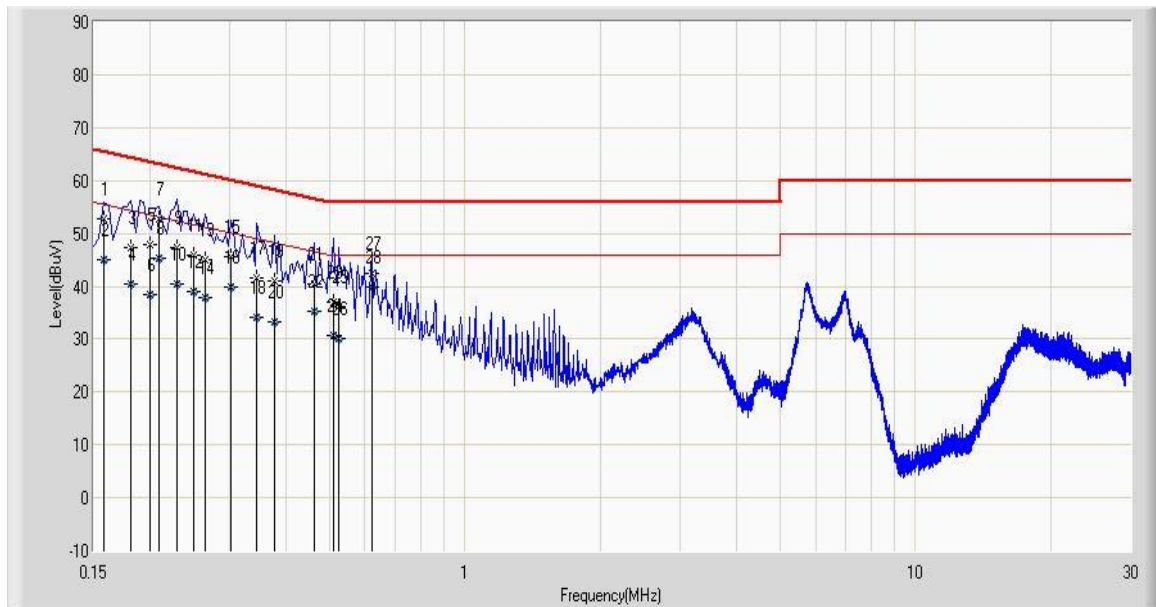
Note 1: At transitional frequencies the lower limit applies.
 Note 2: Applicable only to ports intended for connection to:

- a local DC power network, or
- a remote local battery by a connecting cable exceeding a length of 30 m.

Port	AC output
Test method	LISN
Mode	Normal Operation

Test Result

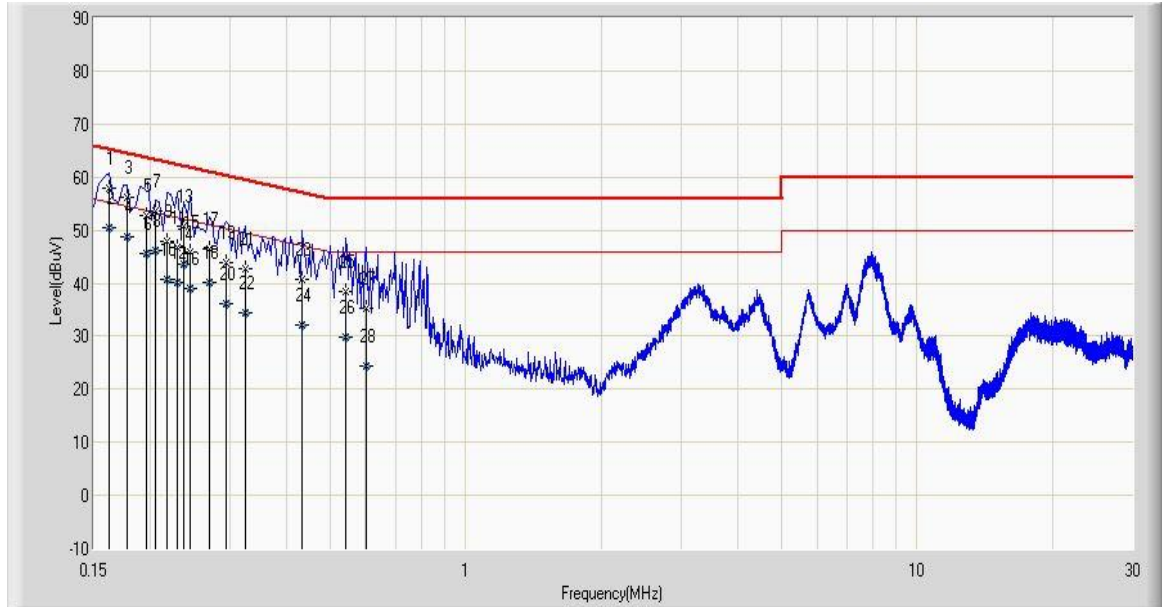
Neutral



Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
0.158	52.695	52.620	-12.873	65.568	0.046	0.029	0.000	QP
0.158	45.053	44.978	-10.516	55.568	0.046	0.029	0.000	AV
0.182	47.193	47.128	-17.201	64.394	0.037	0.028	0.000	QP
0.182	40.407	40.342	-13.987	54.394	0.037	0.028	0.000	AV
0.200	47.831	47.768	-15.779	63.611	0.034	0.029	0.000	QP
0.200	38.513	38.450	-15.097	53.611	0.034	0.029	0.000	AV
0.210	52.847	52.783	-10.358	63.205	0.035	0.029	0.000	QP
0.210	45.253	45.189	-7.953	53.205	0.035	0.029	0.000	AV
0.230	47.291	47.224	-15.158	62.450	0.038	0.030	0.000	QP
0.230	40.323	40.256	-12.126	52.450	0.038	0.030	0.000	AV
0.250	45.980	45.906	-15.777	61.757	0.043	0.031	0.000	QP
0.250	38.924	38.850	-12.833	51.757	0.043	0.031	0.000	AV
0.266	45.083	45.002	-16.159	61.242	0.048	0.033	0.000	QP
0.266	37.815	37.735	-13.427	51.242	0.048	0.033	0.000	AV
0.302	45.615	45.523	-14.573	60.188	0.057	0.034	0.000	QP
0.302	39.734	39.643	-10.454	50.188	0.057	0.034	0.000	AV

0.346	41.651	41.547	-17.407	59.058	0.069	0.036	0.000	QP
0.346	34.152	34.047	-14.906	49.058	0.069	0.036	0.000	AV
0.378	41.095	40.980	-17.228	58.323	0.077	0.037	0.000	QP
0.378	33.319	33.204	-15.005	48.323	0.077	0.037	0.000	AV
0.462	40.390	40.250	-16.266	56.657	0.100	0.041	0.000	QP
0.462	35.209	35.068	-11.447	46.657	0.100	0.041	0.000	AV
0.510	36.894	36.739	-19.106	56.000	0.110	0.045	0.000	QP
0.510	30.567	30.412	-15.433	46.000	0.110	0.045	0.000	AV
0.526	36.139	35.983	-19.861	56.000	0.111	0.044	0.000	QP
0.526	30.198	30.042	-15.802	46.000	0.111	0.044	0.000	AV
0.622	42.331	42.167	-13.669	56.000	0.116	0.048	0.000	QP
0.622	39.988	39.825	-6.012	46.000	0.116	0.048	0.000	AV

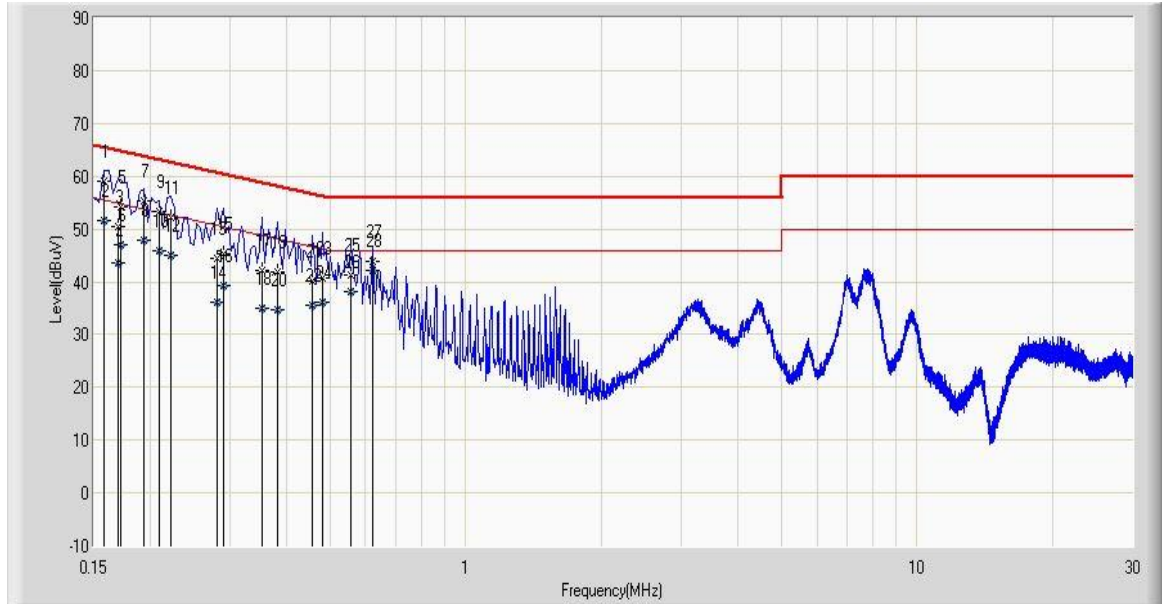
Line1



Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
0.162	57.953	57.765	-7.408	65.361	0.159	0.029	0.000	QP
0.162	50.527	50.339	-4.834	55.361	0.159	0.029	0.000	AV
0.178	56.264	56.063	-8.315	64.578	0.172	0.028	0.000	QP
0.178	48.698	48.498	-5.881	54.578	0.172	0.028	0.000	AV
0.196	52.672	52.462	-11.106	63.778	0.182	0.029	0.000	QP
0.196	45.474	45.264	-8.304	53.778	0.182	0.029	0.000	AV
0.206	53.747	53.534	-9.618	63.365	0.183	0.029	0.000	QP
0.206	46.084	45.872	-7.281	53.365	0.183	0.029	0.000	AV
0.218	47.872	47.658	-15.022	62.895	0.185	0.029	0.000	QP
0.218	40.637	40.423	-12.258	52.895	0.185	0.029	0.000	AV
0.230	46.746	46.534	-15.704	62.450	0.182	0.030	0.000	QP
0.230	40.163	39.951	-12.287	52.450	0.182	0.030	0.000	AV
0.238	50.621	50.411	-11.545	62.166	0.180	0.030	0.000	QP
0.238	43.630	43.420	-8.536	52.166	0.180	0.030	0.000	AV
0.246	45.743	45.534	-16.148	61.891	0.178	0.031	0.000	QP
0.246	38.990	38.781	-12.901	51.891	0.178	0.031	0.000	AV
0.270	46.419	46.214	-14.699	61.118	0.171	0.033	0.000	QP
0.270	40.135	39.931	-10.983	51.118	0.171	0.033	0.000	AV
0.294	43.881	43.682	-16.530	60.411	0.165	0.034	0.000	QP
0.294	36.060	35.861	-14.350	50.411	0.165	0.034	0.000	AV
0.326	42.743	42.552	-16.810	59.552	0.156	0.035	0.000	QP
0.326	34.279	34.087	-15.274	49.552	0.156	0.035	0.000	AV
0.434	40.762	40.594	-16.414	57.176	0.128	0.040	0.000	QP
0.434	32.013	31.845	-15.163	47.176	0.128	0.040	0.000	AV

0.542	38.297	38.141	-17.703	56.000	0.112	0.044	0.000	QP
0.542	29.909	29.753	-16.091	46.000	0.112	0.044	0.000	AV
0.602	35.414	35.253	-20.586	56.000	0.115	0.046	0.000	QP
0.602	24.470	24.309	-21.530	46.000	0.115	0.046	0.000	AV

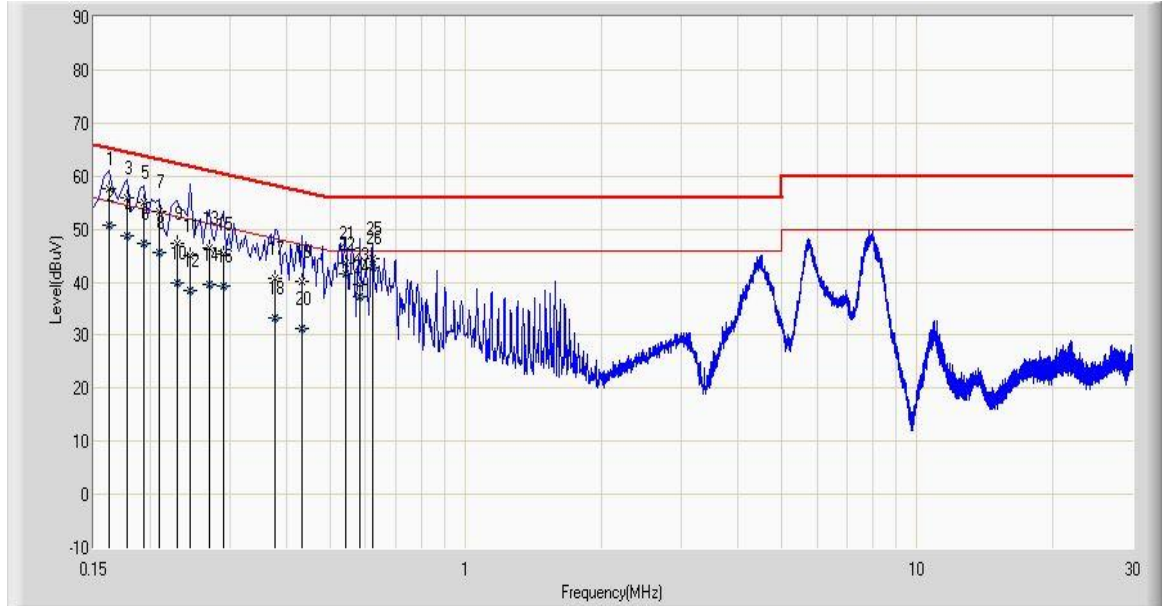
Line2



Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
0.158	59.025	58.950	-6.544	65.568	0.046	0.029	0.000	QP
0.158	51.561	51.486	-4.007	55.568	0.046	0.029	0.000	AV
0.170	50.328	50.258	-14.632	64.960	0.042	0.028	0.000	QP
0.170	43.681	43.611	-11.279	54.960	0.042	0.028	0.000	AV
0.172	54.073	54.004	-10.790	64.863	0.041	0.028	0.000	QP
0.172	47.124	47.055	-7.739	54.863	0.041	0.028	0.000	AV
0.194	55.315	55.253	-8.548	63.864	0.034	0.028	0.000	QP
0.194	47.790	47.728	-6.073	53.864	0.034	0.028	0.000	AV
0.210	53.417	53.353	-9.788	63.205	0.035	0.029	0.000	QP
0.210	45.937	45.872	-7.269	53.205	0.035	0.029	0.000	AV
0.222	52.107	52.040	-10.637	62.744	0.037	0.029	0.000	QP
0.222	44.913	44.847	-7.830	52.744	0.037	0.029	0.000	AV
0.282	44.345	44.257	-16.411	60.757	0.055	0.033	0.000	QP
0.282	36.097	36.009	-14.660	50.757	0.055	0.033	0.000	AV
0.290	45.420	45.329	-15.104	60.524	0.057	0.034	0.000	QP
0.290	39.245	39.154	-11.279	50.524	0.057	0.034	0.000	AV
0.354	42.129	42.017	-16.739	58.868	0.077	0.036	0.000	QP
0.354	34.998	34.886	-13.870	48.868	0.077	0.036	0.000	AV
0.382	41.809	41.687	-16.427	58.236	0.085	0.038	0.000	QP
0.382	34.702	34.580	-13.534	48.236	0.085	0.038	0.000	AV
0.458	40.223	40.074	-16.506	56.729	0.108	0.041	0.000	QP
0.458	35.621	35.472	-11.108	46.729	0.108	0.041	0.000	AV
0.482	40.641	40.485	-15.663	56.305	0.115	0.041	0.000	QP
0.482	36.137	35.980	-10.168	46.305	0.115	0.041	0.000	AV
0.558	41.218	41.053	-14.782	56.000	0.120	0.045	0.000	QP

0.558	38.264	38.099	-7.736	46.000	0.120	0.045	0.000	AV
0.622	43.977	43.809	-12.023	56.000	0.120	0.048	0.000	QP
0.622	42.102	41.934	-3.898	46.000	0.120	0.048	0.000	AV

Line3



Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
0.162	57.673	57.485	-7.688	65.361	0.159	0.029	0.000	QP
0.162	50.752	50.564	-4.609	55.361	0.159	0.029	0.000	AV
0.178	55.919	55.719	-8.660	64.578	0.172	0.028	0.000	QP
0.178	48.654	48.454	-5.924	54.578	0.172	0.028	0.000	AV
0.194	55.091	54.880	-8.772	63.864	0.183	0.028	0.000	QP
0.194	47.369	47.158	-6.494	53.864	0.183	0.028	0.000	AV
0.210	53.457	53.240	-9.748	63.205	0.188	0.029	0.000	QP
0.210	45.614	45.397	-7.591	53.205	0.188	0.029	0.000	AV
0.230	47.304	47.083	-15.146	62.450	0.192	0.030	0.000	QP
0.230	39.772	39.551	-12.677	52.450	0.192	0.030	0.000	AV
0.246	45.107	44.884	-16.784	61.891	0.193	0.031	0.000	QP
0.246	38.389	38.166	-13.502	51.891	0.193	0.031	0.000	AV
0.270	46.395	46.168	-14.723	61.118	0.194	0.033	0.000	QP
0.270	39.575	39.347	-11.543	51.118	0.194	0.033	0.000	AV
0.290	45.400	45.170	-15.125	60.524	0.196	0.034	0.000	QP
0.290	39.227	38.997	-11.298	50.524	0.196	0.034	0.000	AV
0.378	40.737	40.498	-17.587	58.323	0.202	0.037	0.000	QP
0.378	33.148	32.909	-15.175	48.323	0.202	0.037	0.000	AV
0.434	40.027	39.782	-17.149	57.176	0.205	0.040	0.000	QP
0.434	31.257	31.012	-15.919	47.176	0.205	0.040	0.000	AV
0.542	43.585	43.339	-12.415	56.000	0.201	0.044	0.000	QP
0.542	41.487	41.242	-4.513	46.000	0.201	0.044	0.000	AV
0.582	39.624	39.386	-16.376	56.000	0.193	0.045	0.000	QP
0.582	37.339	37.100	-8.661	46.000	0.193	0.045	0.000	AV
0.622	44.408	44.175	-11.592	56.000	0.185	0.048	0.000	QP

0.622	42.625	42.392	-3.375	46.000	0.185	0.048	0.000	AV
-------	--------	--------	--------	--------	-------	-------	-------	----

Refer to chapter 6 for the test set-up.

Conclusion:

PASS

4.1 Conducted Emissions (Telecommunication Ports)

Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15MHz to 30 MHz				
Frequency range MHz	Voltage Limits dB(μ V)		Current limits dB(μ A)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	84 - 74	74 - 64	40 - 30	30 - 20
0.50 to 30	74	64	30	20

NOTE 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

NOTE 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is $20 \log_{10} 150 / I = 44\text{dB}$).

Test Result

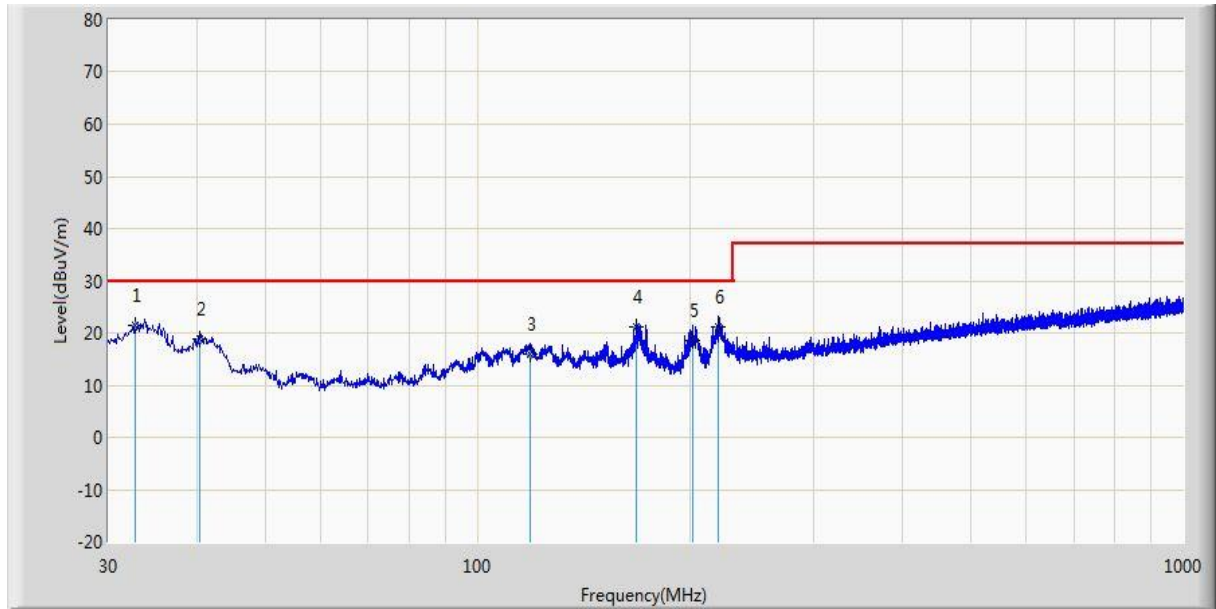
The EUT does not contain the wired network port, so it needs not to perform this test item.

4.2 Radiated Emission

Limits for radiated emission at a measuring distance of 10m		
Frequency range MHz	Quasi-peak limits dB(μ V/m)	
30 to 230	30	
230 to 1000	37	
Limits for radiated emission at a measuring distance of 3m		
Frequency range GHz	Average limit dB(μ V/m)	Peak-peak dB(μ V/m)
1 to 3	50	70
3 to 6	54	74

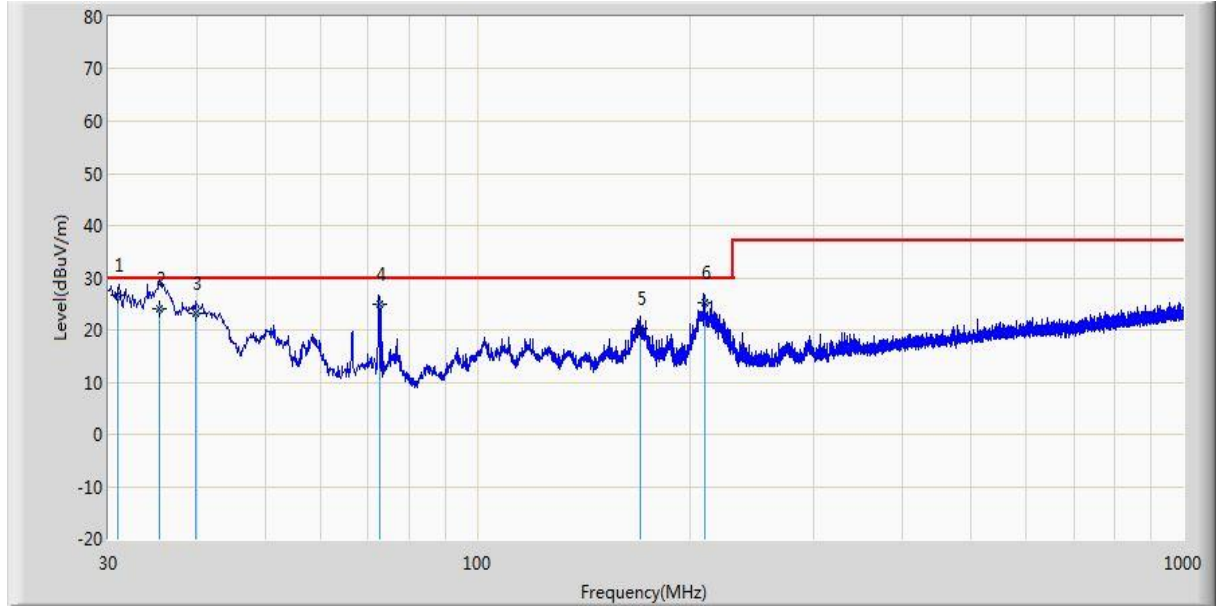
Note 1: If the internal emission source(s) is operating at a frequency below 9 kHz then measurements need only to be performed up to 230 MHz.

Note 2: At transitional frequencies the lower limit applies.

Test Result of Below 1GHz
Horizontal


Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
32.750	21.457	26.940	-8.543	30.000	15.168	1.005	21.656	400	162	QP
40.360	18.854	26.160	-11.146	30.000	13.240	1.126	21.672	300	147	QP
118.670	15.809	22.700	-14.191	30.000	12.727	2.036	21.654	100	261	QP
168.230	21.181	30.640	-8.819	30.000	9.671	2.481	21.610	300	49	QP
201.820	18.441	27.890	-11.559	30.000	9.369	2.752	21.570	400	121	QP
219.440	21.254	29.870	-8.746	30.000	10.039	2.887	21.542	100	159	QP

Vertical



Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
30.870	26.565	32.690	-3.435	30.000	15.574	1.095	22.795	200	161	QP
35.468	24.139	31.400	-5.861	30.000	14.378	1.179	22.818	400	15	QP
39.870	23.050	31.440	-6.950	30.000	13.194	1.250	22.833	200	182	QP
72.610	24.791	38.670	-5.209	30.000	7.247	1.735	22.861	100	264	QP
170.210	20.337	30.420	-9.663	30.000	9.970	2.780	22.834	200	337	QP
209.710	25.159	35.180	-4.841	30.000	9.660	3.133	22.814	400	16	QP

Refer to chapter 6 for the test set-up.

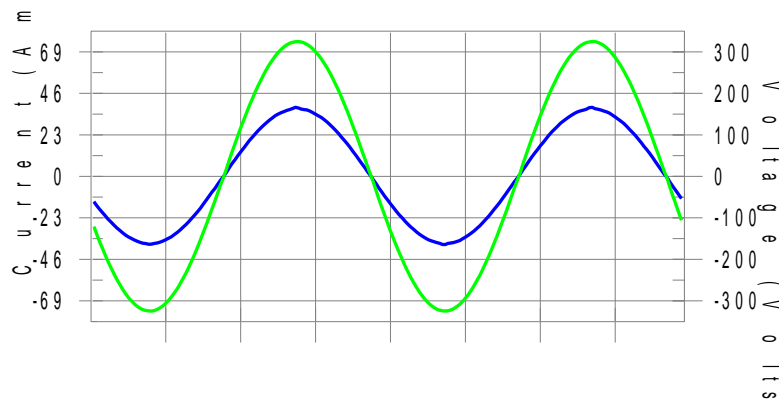
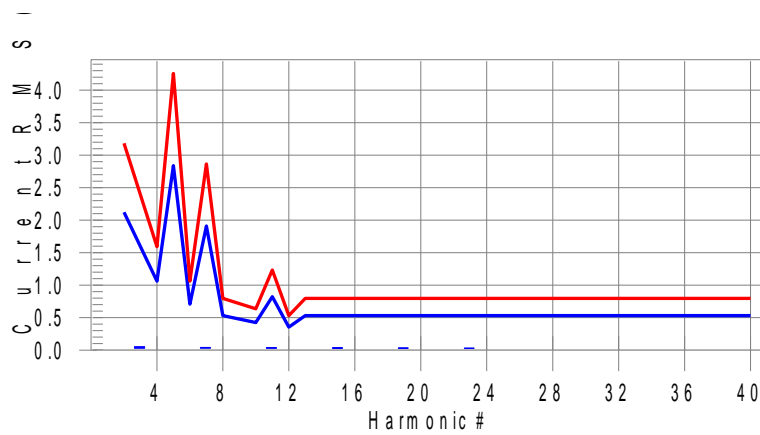
Conclusion:

PASS

4.3 Harmonic current emissions

Standard	EN 61000-3-12 > 16A and ≤75A
Port	AC Mains supply
Mode	Normal Operation

✓	Class A	All apparatus not classified as Class B, C or D
	Class B	Portable tools
	Class C	Lighting equipment
	Class D	Personal computers, television receivers

Results and limits of (EN 61000-3-12)
Test Result: Pass **Source qualification: Normal**
Current & voltage waveforms

Harmonics and Class 2 limit line
European Limits

Test result: Pass



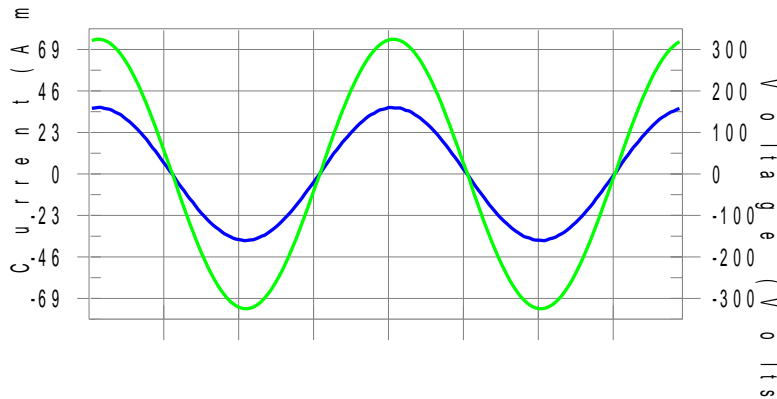
Test Result: Pass Measured I-ref: 26.601(Amps) Source: Normal
 I-THC(%): 0.5 Limit(%): 13.0 PWHC(%): 1.4 PWHC Limit(%): 22.0

Highest parameter values during test: phase A

V_RMS (Volts): 229.68 Frequency(Hz): 50.00
 I_Peak (Amps): 38.691 I_RMS (Amps): 26.601
 I_Fund (Amps): 26.526 Crest Factor: 1.457
 Power (Watts): -6108 Power Factor: -1.000

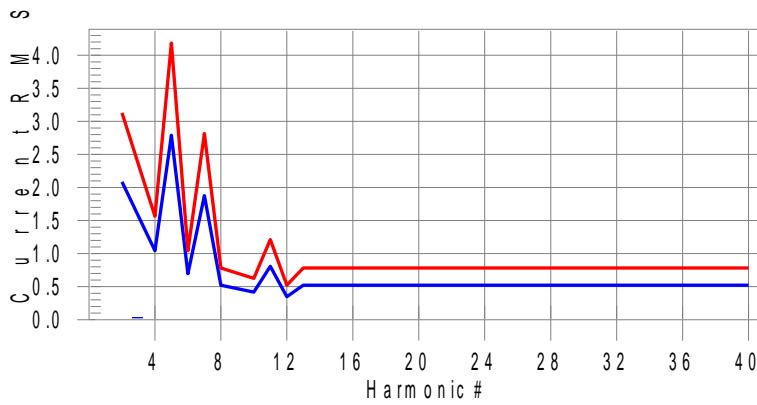
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.027	2.122	1.3	0.037	3.183	1.2	Pass
3	0.053	N/A	N/A	0.079	N/A	N/A	N/A
4	0.012	1.061	1.1	0.020	1.592	1.3	Pass
5	0.028	2.838	1.0	0.034	4.257	0.8	Pass
6	0.009	0.707	1.3	0.011	1.061	1.0	Pass
7	0.041	1.910	2.2	0.044	2.865	1.6	Pass
8	0.009	0.531	1.8	0.014	0.796	1.8	Pass
9	0.028	N/A	N/A	0.033	N/A	N/A	N/A
10	0.009	0.424	2.2	0.012	0.637	1.9	Pass
11	0.040	0.822	4.9	0.044	1.233	3.6	Pass
12	0.008	0.354	2.3	0.010	0.531	2.0	Pass
13	0.020	0.531	3.8	0.027	0.796	3.3	Pass
14	0.009	N/A	N/A	0.013	N/A	N/A	N/A
15	0.037	N/A	N/A	0.042	N/A	N/A	N/A
16	0.008	N/A	N/A	0.022	N/A	N/A	N/A
17	0.015	N/A	N/A	0.027	N/A	N/A	N/A
18	0.008	N/A	N/A	0.020	N/A	N/A	N/A
19	0.034	N/A	N/A	0.040	N/A	N/A	N/A
20	0.007	N/A	N/A	0.017	N/A	N/A	N/A
21	0.013	N/A	N/A	0.021	N/A	N/A	N/A
22	0.008	N/A	N/A	0.023	N/A	N/A	N/A
23	0.030	N/A	N/A	0.041	N/A	N/A	N/A
24	0.007	N/A	N/A	0.021	N/A	N/A	N/A
25	0.010	N/A	N/A	0.014	N/A	N/A	N/A
26	0.006	N/A	N/A	0.010	N/A	N/A	N/A
27	0.025	N/A	N/A	0.028	N/A	N/A	N/A
28	0.005	N/A	N/A	0.011	N/A	N/A	N/A
29	0.008	N/A	N/A	0.013	N/A	N/A	N/A
30	0.005	N/A	N/A	0.009	N/A	N/A	N/A
31	0.022	N/A	N/A	0.024	N/A	N/A	N/A
32	0.004	N/A	N/A	0.007	N/A	N/A	N/A
33	0.006	N/A	N/A	0.009	N/A	N/A	N/A
34	0.004	N/A	N/A	0.005	N/A	N/A	N/A
35	0.018	N/A	N/A	0.019	N/A	N/A	N/A
36	0.003	N/A	N/A	0.004	N/A	N/A	N/A
37	0.004	N/A	N/A	0.005	N/A	N/A	N/A
38	0.003	N/A	N/A	0.004	N/A	N/A	N/A
39	0.014	N/A	N/A	0.015	N/A	N/A	N/A
40	0.003	N/A	N/A	0.004	N/A	N/A	N/A

Note: Measured I-ref was applied for this test.



Harmonics and Class 2 limit line

European Limits



Test result: Pass

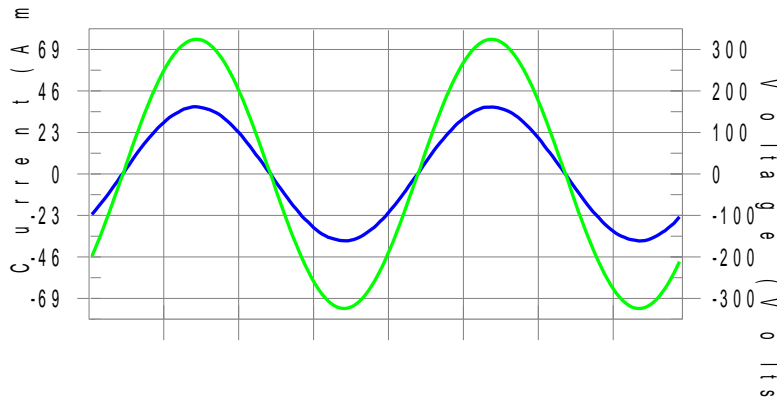
Test Result: Pass Measured I-ref: 26.122(Amps) Source: Normal
 I-THC(%): 0.3 Limit(%): 13.0 PWHC(%): 0.7 PWHC Limit(%): 22.0

Highest parameter values during test: phase B

V_RMS (Volts): 229.69 Frequency(Hz): 50.00
 I_Peak (Amps): 37.383 I_RMS (Amps): 26.122
 I_Fund (Amps): 26.073 Crest Factor: 1.432
 Power (Watts): -5998 Power Factor: -1.000

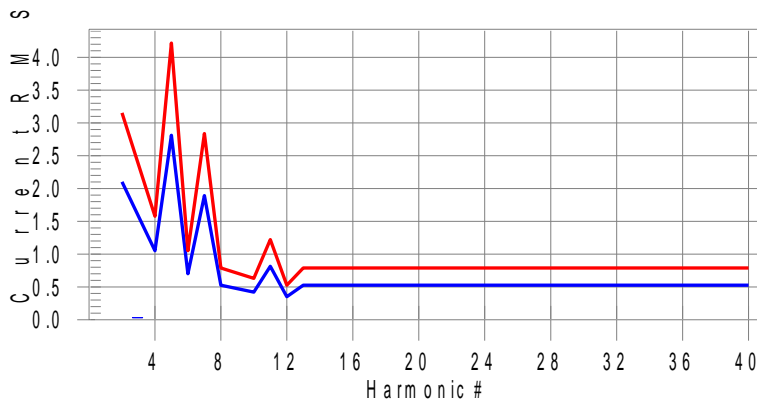
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.027	2.086	1.3	0.038	3.129	1.2	Pass
3	0.053	N/A	N/A	0.055	N/A	N/A	N/A
4	0.011	1.043	1.0	0.012	1.564	0.8	Pass
5	0.019	2.790	0.7	0.024	4.185	0.6	Pass
6	0.003	0.695	N/A	0.010	1.043	1.0	Pass
7	0.018	1.877	1.0	0.026	2.816	0.9	Pass
8	0.005	0.521	1.1	0.019	0.782	2.4	Pass
9	0.028	N/A	N/A	0.032	N/A	N/A	N/A
10	0.003	0.417	N/A	0.019	0.626	3.0	Pass
11	0.018	0.808	2.2	0.035	1.212	2.9	Pass
12	0.003	0.348	N/A	0.014	0.521	2.7	Pass
13	0.015	0.521	2.9	0.026	0.782	3.4	Pass
14	0.003	N/A	N/A	0.020	N/A	N/A	N/A
15	0.014	N/A	N/A	0.024	N/A	N/A	N/A
16	0.002	N/A	N/A	0.019	N/A	N/A	N/A
17	0.013	N/A	N/A	0.023	N/A	N/A	N/A
18	0.002	N/A	N/A	0.009	N/A	N/A	N/A
19	0.012	N/A	N/A	0.027	N/A	N/A	N/A
20	0.002	N/A	N/A	0.015	N/A	N/A	N/A
21	0.013	N/A	N/A	0.047	N/A	N/A	N/A
22	0.003	N/A	N/A	0.032	N/A	N/A	N/A
23	0.013	N/A	N/A	0.043	N/A	N/A	N/A
24	0.003	N/A	N/A	0.030	N/A	N/A	N/A
25	0.012	N/A	N/A	0.041	N/A	N/A	N/A
26	0.003	N/A	N/A	0.022	N/A	N/A	N/A
27	0.011	N/A	N/A	0.040	N/A	N/A	N/A
28	0.003	N/A	N/A	0.030	N/A	N/A	N/A
29	0.010	N/A	N/A	0.038	N/A	N/A	N/A
30	0.003	N/A	N/A	0.028	N/A	N/A	N/A
31	0.009	N/A	N/A	0.034	N/A	N/A	N/A
32	0.002	N/A	N/A	0.016	N/A	N/A	N/A
33	0.007	N/A	N/A	0.020	N/A	N/A	N/A
34	0.001	N/A	N/A	0.002	N/A	N/A	N/A
35	0.006	N/A	N/A	0.008	N/A	N/A	N/A
36	0.001	N/A	N/A	0.002	N/A	N/A	N/A
37	0.006	N/A	N/A	0.007	N/A	N/A	N/A
38	0.001	N/A	N/A	0.002	N/A	N/A	N/A
39	0.006	N/A	N/A	0.007	N/A	N/A	N/A
40	0.001	N/A	N/A	0.001	N/A	N/A	N/A

Note: Measured I-ref was applied for this test.



Harmonics and Class 2 limit line

European Limits



Test result: Pass

Test Result: Pass Measured I-ref: 26.329(Amps) Source: Normal
 I-THC(%): 0.3 Limit(%): 13.0 PWHC(%): 0.7 PWHC Limit(%): 22.0

Highest parameter values during test: phase C

V_RMS (Volts): 229.53 Frequency(Hz): 50.00
 I_Peak (Amps): 37.654 I_RMS (Amps): 26.329
 I_Fund (Amps): 26.280 Crest Factor: 1.432
 Power (Watts): -6041 Power Factor: -1.000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.026	2.102	1.3	0.037	3.153	1.2	Pass
3	0.053	N/A	N/A	0.056	N/A	N/A	N/A
4	0.011	1.051	1.0	0.012	1.577	0.8	Pass
5	0.018	2.812	0.6	0.022	4.218	0.5	Pass
6	0.003	0.701	N/A	0.014	1.051	1.4	Pass
7	0.016	1.892	0.9	0.031	2.838	1.1	Pass
8	0.006	0.526	1.1	0.027	0.788	3.5	Pass
9	0.028	N/A	N/A	0.036	N/A	N/A	N/A
10	0.004	0.420	N/A	0.027	0.631	4.3	Pass
11	0.018	0.815	2.2	0.033	1.222	2.7	Pass
12	0.003	0.350	N/A	0.020	0.526	3.9	Pass
13	0.016	0.526	3.0	0.038	0.788	4.8	Pass
14	0.004	N/A	N/A	0.028	N/A	N/A	N/A
15	0.015	N/A	N/A	0.035	N/A	N/A	N/A
16	0.003	N/A	N/A	0.029	N/A	N/A	N/A
17	0.014	N/A	N/A	0.040	N/A	N/A	N/A
18	0.003	N/A	N/A	0.013	N/A	N/A	N/A
19	0.012	N/A	N/A	0.022	N/A	N/A	N/A
20	0.002	N/A	N/A	0.009	N/A	N/A	N/A
21	0.012	N/A	N/A	0.031	N/A	N/A	N/A
22	0.003	N/A	N/A	0.020	N/A	N/A	N/A
23	0.011	N/A	N/A	0.025	N/A	N/A	N/A
24	0.003	N/A	N/A	0.018	N/A	N/A	N/A
25	0.011	N/A	N/A	0.024	N/A	N/A	N/A
26	0.002	N/A	N/A	0.013	N/A	N/A	N/A
27	0.010	N/A	N/A	0.025	N/A	N/A	N/A
28	0.002	N/A	N/A	0.018	N/A	N/A	N/A
29	0.009	N/A	N/A	0.025	N/A	N/A	N/A
30	0.002	N/A	N/A	0.017	N/A	N/A	N/A
31	0.009	N/A	N/A	0.024	N/A	N/A	N/A
32	0.001	N/A	N/A	0.010	N/A	N/A	N/A
33	0.007	N/A	N/A	0.012	N/A	N/A	N/A
34	0.001	N/A	N/A	0.002	N/A	N/A	N/A
35	0.007	N/A	N/A	0.008	N/A	N/A	N/A
36	0.001	N/A	N/A	0.001	N/A	N/A	N/A
37	0.006	N/A	N/A	0.007	N/A	N/A	N/A
38	0.001	N/A	N/A	0.001	N/A	N/A	N/A
39	0.006	N/A	N/A	0.007	N/A	N/A	N/A
40	0.001	N/A	N/A	0.002	N/A	N/A	N/A

Note: Measured I-ref was applied for this test.

Conclusion:

PASS

4.4 Voltage fluctuations and flicker

Standard	EN 61000-3-11 > 16A and ≤75A
Port	AC Mains supply
Voltage	230 V
Mode	Normal Operation

Equipment intended to be connected to 230/400 V_{AC} 50 Hz supply systems may not produce voltage fluctuations in the supply systems due to variation of the input current above the limits as stated below.

P _{ST}	≤ 1
P _{LT}	≤ 0.65
T _{max}	≤ 500ms
d _c	≤ 3,3%
d _{MAX}	≤ 4%

Results of (EN 61000-3-11)

Relative voltage change characteristic T _{max}	0 ms
Maximum voltage change d _{MAX}	0.13%
Relative Voltage change d _c	0.00%
Short term flicker P _{ST}	0.192
Long term flicker P _{LT}	0.084

Conclusion:

PASS

5 IMMUNITY TEST RESULTS

5.1 Electrostatic discharge immunity

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.

Environmental phenomenon	Test specification	Units	Performance criterion
Enclosure port			
Electrostatic discharge	±4 (Contact discharge)	kV (Charge voltage)	B
	±8 (Air discharge)	kV (Charge voltage)	

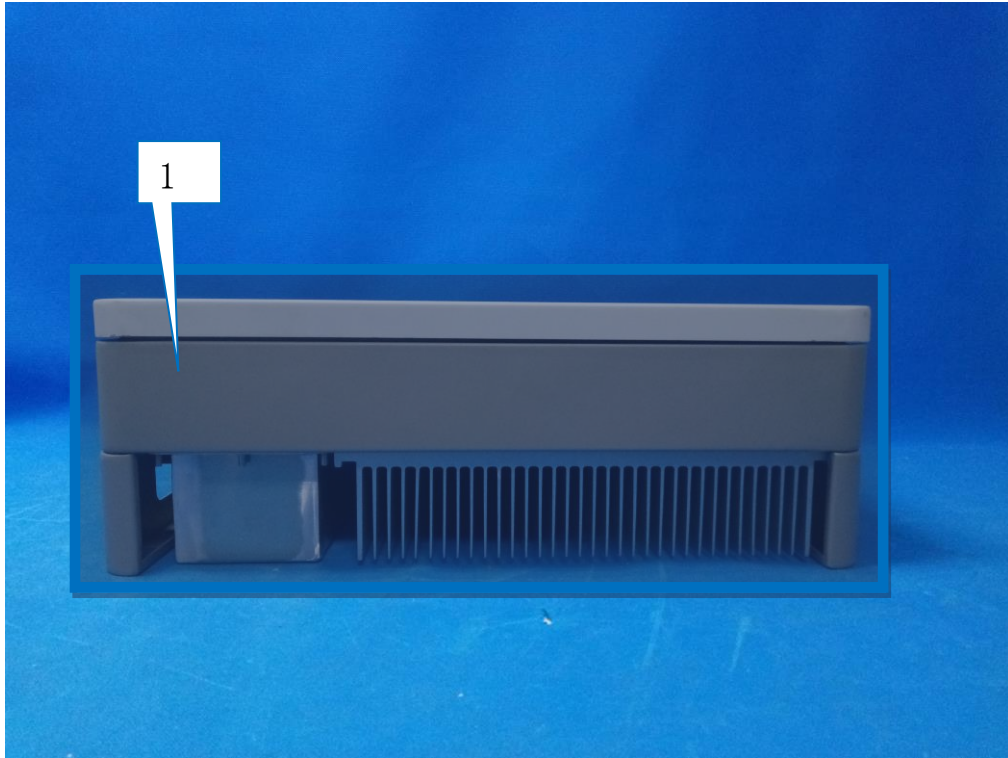
Performed tests

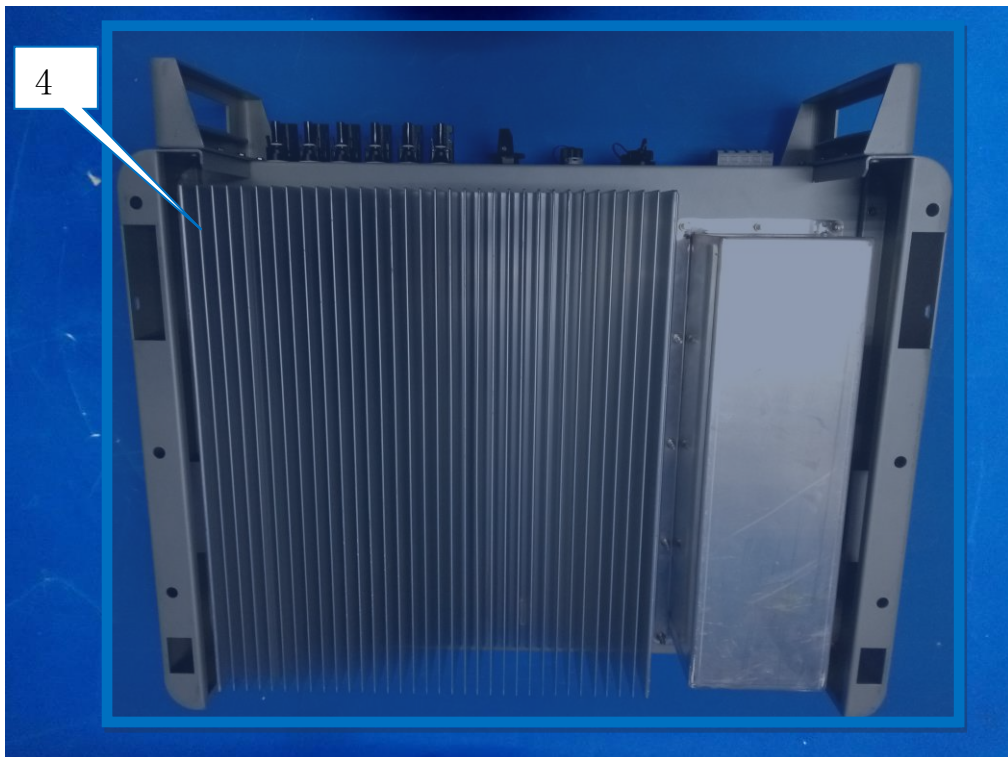
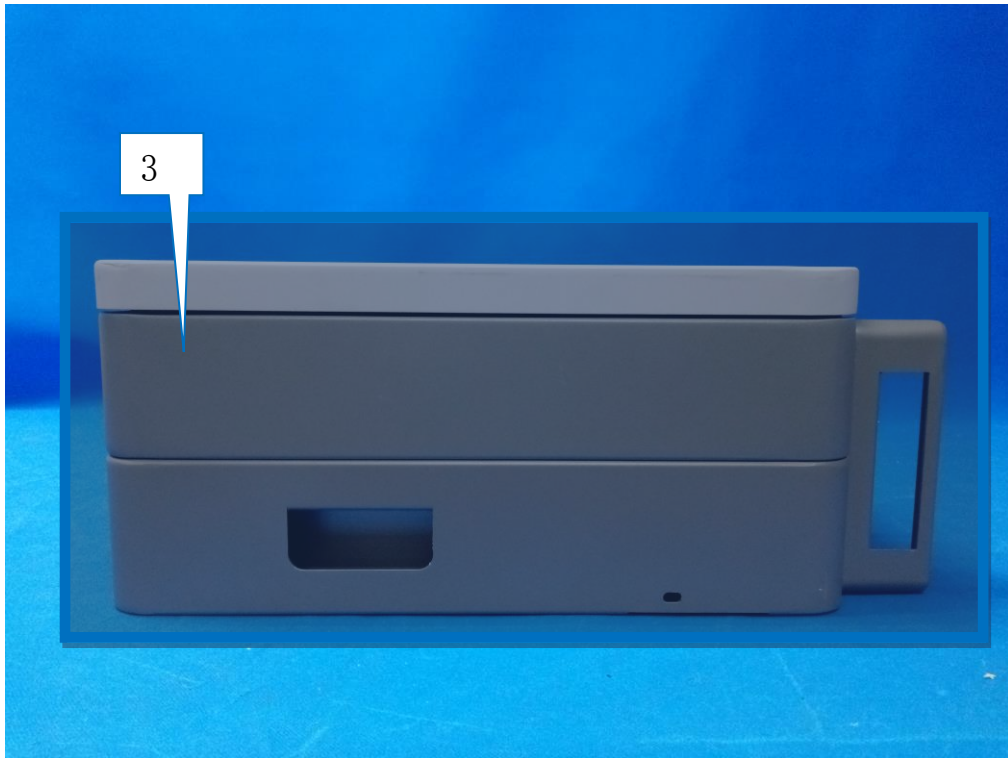
Air discharges	✓	2 kV	✓	4 kV	✓	8 kV	Test Location (6-19)
Contact discharges	✓	2 kV	✓	4 kV		8 kV	Test Location (1-5)&(20-24)
Via coupling planes	✓	Horizontal			✓	Vertical	
Polarity	✓	Positive			✓	Negative	
Set-up	✓	Table-top				Floor standing	
Ambient temperature	24 °C						
Relative Humidity air	48 %						
Mode	Normal Operation						

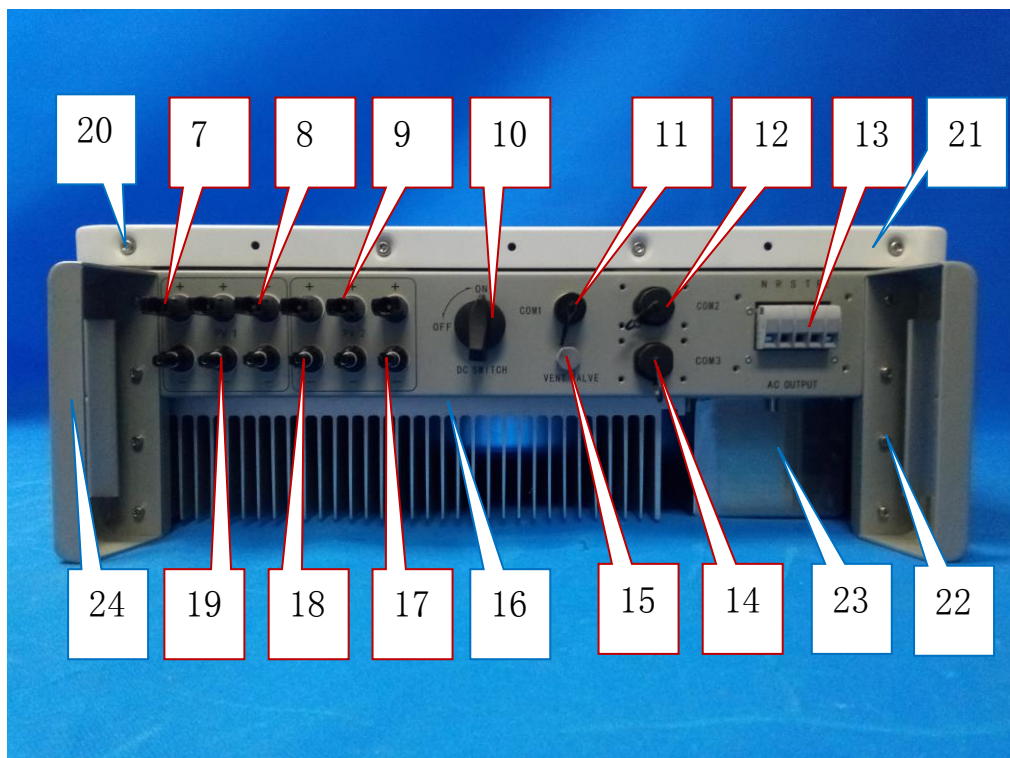
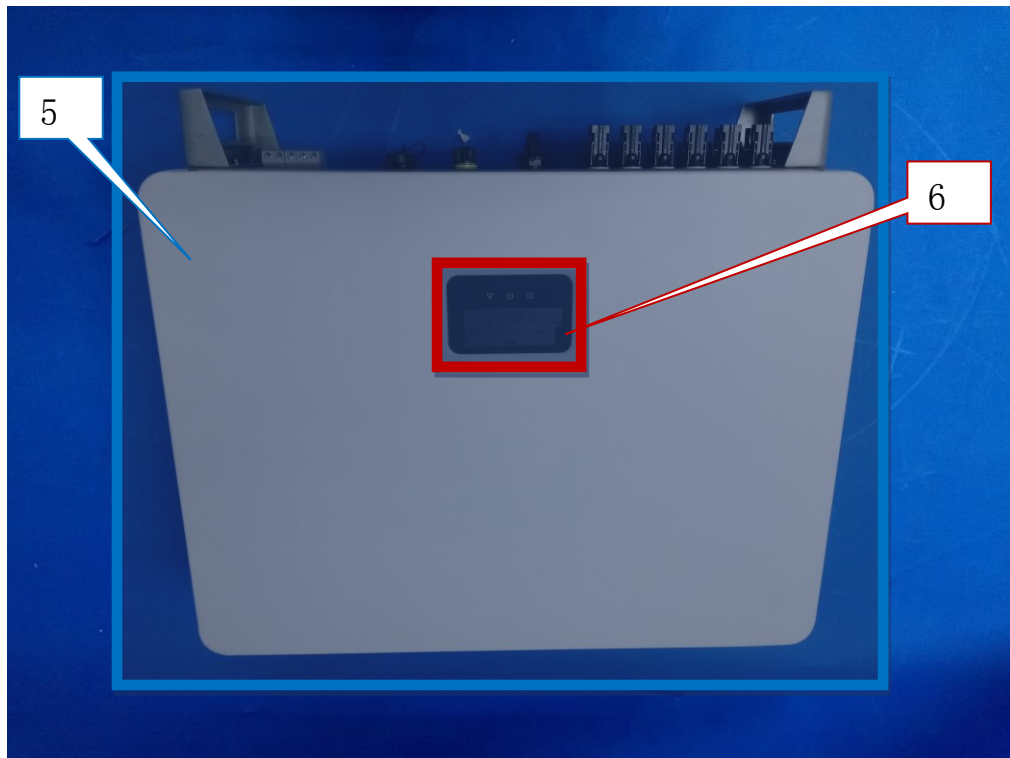
Observations

During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.

Electrostatic discharge Test Location







Conclusion:

PASS

5.2 Radio frequency electromagnetic field

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

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Enclosure port				
Radio-Frequency Electromagnetic Field Amplitude Modulated (See Note 1,2)		MHz V/m (Un-modulated, rms) % AM (1kHz)	80 – 1000 10 80	A
Radio-Frequency Electromagnetic Field Amplitude Modulated (See Note 2,3)		MHz V/m (Un-modulated, rms) % AM (1kHz)	1400 – 2000 3 80	A
Radio-Frequency Electromagnetic Field Amplitude Modulated (See Note 2,3)		MHz V/m (Un-modulated, rms) % AM (1kHz)	2000 - 2700 1 80	A
Note :				
1. Except for the ITU broadcast frequency bands 87 MHz to 108 MHz, 174 MHz to 230 MHz, and 470 MHz to 790 MHz, where the level shall be 3 V/m.				
2. IEC 61000-4-20 may be used for small EUTs as defined in IEC 61000-4-20 subclause 6.1.				
3. The frequency range has been selected to cover the frequencies with the highest potential risk of a disturbance.				

All the scanning conditions are as follows:

	Condition of Test	Remarks
1.	Field Strength	10V/m, 3V/m,1V/m
2.	Radiated Signal	AM 80% Modulated with 1kHz
3.	Scanning Frequency	80 - 1000MHz, 1400 - 2000MHz, 2000 - 2700MHz
4.	Dwell Time	3 Seconds
5.	Frequency Step Size Δf	1%

Performed tests

Frequency range	80 - 1000MHz, 1400 - 2000MHz, 2000 - 2700MHz
Tested Field strength	10V/m, 3V/m,1V/m
Dwell time	3 seconds
Test set-up	Full Anechoic Chamber
Mode	Normal Operation

Observations

During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.

Conclusion:**PASS**

5.3 Fast transients common mode

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.

Environmental phenomenon	Test specification	Units	Performance criterion
Input a.c. power ports			
Fast transients	±2 5/50 5	kV (open circuit test voltage) Tr/Th (ns) Repetition frequency (kHz)	B
Input d.c. power ports			
Fast transients	±2 5/50 5	kV (open circuit test voltage) Tr/Th (ns) Repetition frequency (kHz)	B
Signal ports and telecommunication ports (See Note 1)			
Fast transients	±1 5/50 5	kV (open circuit test voltage) Tr/Th (ns) Repetition frequency (kHz)	B
NOTE 1: Applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m.			

Performed tests

Tested Voltage	2 kV; AC output power port			
Mode	Normal Operation			
Injection method	✓	CDN		Capacitive clamp
Polarity	✓	Positive	✓	Negative
Set-up	✓	Table-top		Floor standing

Observations

During the test, the alarm will be raised and the disturbance will be restored to normal after it is stopped.

Conclusion:**PASS**

5.4 Surge

The surge transient immunity test simulates the surges that are caused by overvoltages 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.

Environmental phenomenon	Test specification	Units	Performance criterion
Input a.c. power ports			
Surges	1.2/50 (8/20) ±1 line to line ±2 line to earth (ground)	Tr/Th (us) kV (open circuit test voltage) kV (open circuit test voltage)	B
Input d.c. power ports (See Note 1)			
Surges	1.2/50 (8/20) ±0.5 line to line ±0.5 line to earth (ground)	Tr/Th (us) kV (open circuit test voltage)	B
Signal ports and telecommunication ports (See Note 2, 3)			
Surges Line to Ground	1.2/50 (8/20) ±1	Tr/Th (us) kV (open circuit test voltage)	B
NOTE:			
<p>1. Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC–DC power adaptor shall be tested on the AC power input of the AC- DC power adaptor specified by the manufacturer or, where none is so specified, using a typical AC–DC power adaptor. The test is applicable to DC power input ports intended to be connected permanently to cables longer than 3 m.</p> <p>2. Applicable only to ports interfacing with cables whose total length according to the manufacturer’s functional specification may exceed 30 m.</p> <p>3. Where normal functioning cannot be achieved because of the impact of the CDN on the EUT, this test is not required.</p>			

Performed tests

Tested Voltage; Port	1 kV; AC output power port (Line to Line) 2 kV; AC output power port (Line to Ground)		
Mode	Normal Operation		
Polarity	✓	Positive	✓ Negative

Observations

During the test, the alarm will be raised and the disturbance will be restored to normal after it is stopped.

Conclusion:**PASS**

5.5 Radio frequency common mode

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.

Environmental phenomenon	Test specification	Units	Performance criterion
Input a.c. power ports (See Note 1,2)			
Radio-frequency	0.15 - 80	MHz	A
continuous	10	V (unmodulated, r.m.s)	
conducted	80	% AM (1kHz)	
Input d.c. power ports (See Note 1,2)			
Radio-frequency	0.15 - 80	MHz	A
continuous	10	V (unmodulated, r.m.s)	
conducted	80	% AM (1kHz)	
Signal ports and telecommunication ports (See Note 1,2,3)			
Radio-frequency	0.15 - 80	MHz	A
continuous	10	V (unmodulated, r.m.s)	
conducted	80	% AM (1kHz)	
NOTE:			
1. The test level can also be defined as the equivalent current into a 150 Ω load.			
2. Except for the ITU broadcast frequency band 47 MHz to 68 MHz, where the level shall be 3 V.			
3. Applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m.			

All the scanning conditions are as follows:

	Condition of Test	Remarks
1.	Field Strength	10V
2.	Radiated Signal	AM 80% Modulated with 1kHz
3.	Scanning Frequency	0.15 - 80MHz
4.	Dwell Time	3 Seconds
5.	Frequency Step Size Δf	1%

Performed tests

Tested level; Port	10 V; AC output power port		
Mode	Normal Operation		
Frequency range	0,15 – 80 MHz		
Dwell time	3 seconds		
Injection method	✓	CDN	EM clamp

Observations

During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.

Conclusion:**PASS**

5.6 Power-frequency magnetic field

Environmental phenomenon	Test specification	Units	Performance criterion
Enclosure port(See Note 1,2)			
Power-frequency magnetic field	50,60 30	Hz A/m (r.m.s)	A
<p>NOTE:</p> <p>1. Applicable only to apparatus containing devices susceptible to magnetic fields.</p> <p>2. For CRTs, the acceptable jitter depends upon the character size and is calculated for a test level of 1 A/m as follows:</p> $J \leq \frac{(3C + 1)}{40}$ <p>where jitter J and character size C are in millimetres.</p> <p>As jitter is linearly proportional to the magnetic field strength, tests can be carried out at other test levels extrapolating the maximum jitter level appropriately.</p>			

Performed tests

Tested level	30 A/m					
Mode	Normal Operation					
Frequency	50 Hz					
Dwell time	60 seconds					
Test Coil Position	✓	X Axis	✓	Y Axis	✓	Z Axis

Observations

During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.

Conclusion:

PASS

6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

The photograph shows the tested device.



Figure 4 Conducted Emission test setup



Figure 5 Radiated Emission test setup (Below 1GHz)



Figure 6 Harmonic current emission test setup



Figure 7 Voltage fluctuations and flicker test setup



Figure 8 Electrostatic discharge test setup

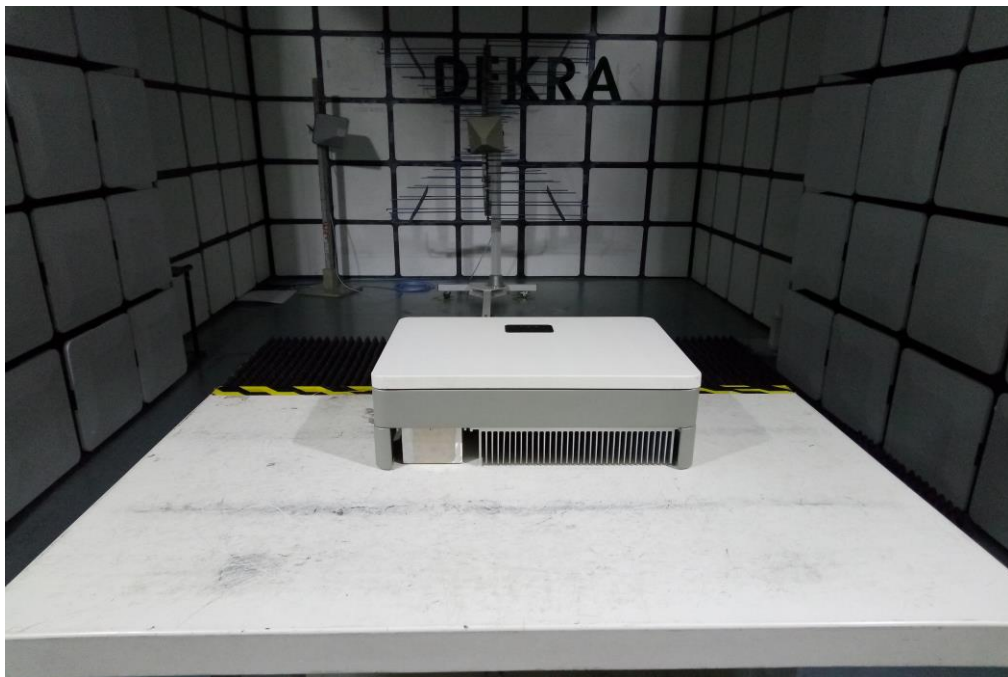


Figure 9 Radio frequency electromagnetic field test setup (Below 1GHz)

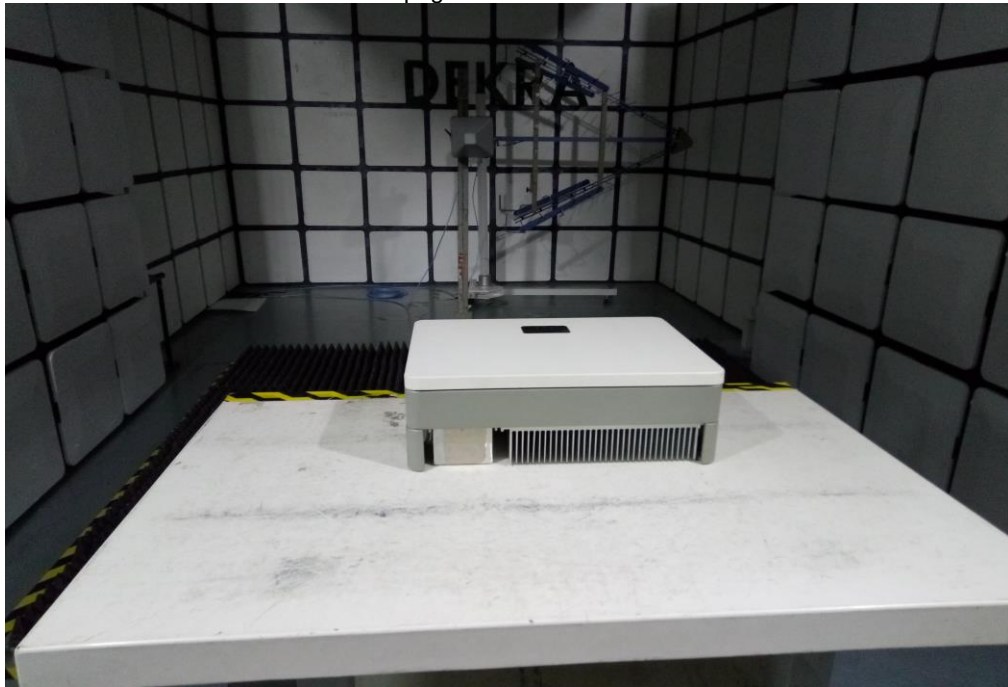


Figure 10 Radio frequency electromagnetic field test setup (Above 1GHz)



Figure 11 Electrical fast transients test setup



Figure 12 Surges test setup



Figure 13 Radio-frequency continuous conducted test setup



Figure 14 Power frequency magnetic field test setup

-----END-----