

Standards EN62040-2: 2006

TEST REPORT

For

INVT POWER SYSTEM(SHENZHEN) CO., LTD

Uninterruptible Power Systems

Model Number: HR33010CL, HR33015CL, HR33020CL, HR33025CL,
HR31010CL, HR31015CL, HR31020CL

Prepared for : INVT POWER SYSTEM(SHENZHEN) CO., LTD
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TEST REPORT VERIFICATION

Applicant : INVT POWER SYSTEM(SHENZHEN) CO., LTD
 Manufacturer : INVT POWER SYSTEM(SHENZHEN) CO., LTD
 Trademark : INVT
 EUT : Uninterruptible Power Systems
 Model Number : HR33010CL, HR33015CL, HR33020CL, HR33025CL, HR31010CL, HR31015CL, HR31020CL
 Power Supply : Please see the page 8

Measurement Procedure Used:

EN62040-2: 2006,
 EN 61000-3-12: 2011
 EN 61000-3-11: 2000
 (IEC 61000-4-2:2008, IEC 61000-4-3:2006+A1:2007+A2:2010, IEC 61000-4-4:2012,
 IEC 61000-4-5:2014, IEC 61000-4-6:2013, IEC 61000-4-8:2009, IEC 61000-4-11:2004,
 IEC 61000-2-2:2002)

The device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 62040-2 requirements.

In this report the model and configuration chosen for each test is representative for all models or configurations (defined in the user manual) by using The "Worst Case" approach of the Guide for the EMC Directive 2014/30/EU.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test : August 03, 2017 to August 27, 2017

Bunny Zhang

Prepared by : Bunny Zhang/Editor

Reviewer : Jessie Hu/Supervisor



Approved & Authorized Signer : Lisa Wang/Manager

Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ES170731050E	/	Original Report

1. SUMMARY OF TEST RESULTS

EMISSION			
Description of test item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN62040-2: 2006	C3	Pass
Radiated Disturbance	EN62040-2: 2006	C3	Pass
Harmonic current emissions	EN61000-3-12: 2005	-	Pass
Voltage fluctuation and flicker	EN61000-3-11: 2000	-	Pass
Immunity			
Description of test item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008	B	Pass
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3:2006+A1:2007+A2:2010	A	Pass
EFT/B Immunity	IEC 61000-4-4:2012	B	Pass
Surge Immunity	IEC 61000-4-5:2014	B	Pass
Conducted RF Immunity	IEC 61000-4-6:2013	A	Pass
Power frequency magnetic field	IEC 61000-4-8:2009	A	Pass
Voltage dips and Voltage interruptions	IEC 61000-4-11:2004	B	Pass
Low Frequency signals	IEC 61000-2-2:2002	A	Pass
Power Line Unbalance (Three-Phase Ups Systems Only)	EN62040-2: 2006	A	Pass
Note: /			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	Uninterruptible Power Systems
Model Number	:	HR33010CL, HR33015CL, HR33020CL, HR33025CL, HR31010CL, HR31015CL, HR31020CL (Note: These models are identical in circuitry and electrical, mechanical and physical construction; the only differences are the rating and model number. for trading purpose. We prepare HR33025CL for test.)
Test voltage	:	AC 380V/50Hz
Power Supply	:	HR33025CL : Input: 380/400/415VAC, 50/60Hz, 48Amax Output: 380/400/415VAC, 50/60Hz, 25KVA/25KW HR33020CL : Input: 380/400/415VAC, 50/60Hz, 39Amax Output: 380/400/415VAC, 50/60Hz, 20KVA/20KW HR33015CL : Input: 380/400/415VAC, 50/60Hz, 30Amax Output: 380/400/415VAC, 50/60Hz, 15KVA/15KW HR33010CL : Input: 380/400/415VAC, 50/60Hz, 20Amax Output: 380/400/415VAC, 50/60Hz, 10KVA/10KW HR31020CL : Input: 380/400/415VAC, 50/60Hz, 39Amax Output: 380/400/415VAC, 50/60Hz, 20KVA/20KW HR31015CL : Input: 380/400/415VAC, 50/60Hz, 30Amax Output: 380/400/415VAC, 50/60Hz, 15KVA/15KW HR31010CL : Input: 380/400/415VAC, 50/60Hz, 20Amax Output: 380/400/415VAC, 50/60Hz, 10KVA/10KW
Applicant	:	INVT POWER SYSTEM(SHENZHEN) CO., LTD
Address	:	5# Building, Gaofa Industrial Park, Longjing, Nanshan District, Shenzhen, China, 518055
Manufacturer	:	INVT POWER SYSTEM(SHENZHEN) CO., LTD

Address : 5# Building, Gaofa Industrial Park, Longjing, Nanshan District,
Shenzhen, China, 518055

Date of receiver : August 03, 2017

Date of Test : August 03, 2017 to August 27, 2017

2.2. Description of Support Device

N/A

2.3. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2016.10.24
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance
with CNAS-CL01: 2006 (identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2016.5.19
The Laboratory has been assessed according to the requirements
ISO/IEC 17025.

Accredited by FCC
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by Industry Canada, November 24, 2015
The Certificate Registration Number. is 4480A.

Name of Firm : EMTEK(SHENZHEN) CO., LTD.
Site Location : Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

2.4. Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission Uncertainty	: 3.16dB(9k~150kHz Conduction 2#) 2.90dB(150k-30MHz Conduction 2#)
Radiated Emission Uncertainty (10m Chamber)	: 3.96dB (30M~1GHz Polarize: H) 4.04dB (30M~1GHz Polarize: V)
Uncertainty for Flicker test	: 0.07%
Uncertainty for Harmonic test	: 1.8%
Uncertainty for C/S Test	: 1.45(Using CDN Test)
Uncertainty for R/S Test	: 2.10dB(80MHz-200MHz) 1.76dB(200MHz-1000MHz)
Uncertainty for test site temperature and humidity	: 0.6°C 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Conducted Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	L.I.S.N.	ROHDE & SCHWARZ	ESH3-Z5	100191	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	50Ω Coaxial Switch	Anritsu	MP59B	M20531	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 20, 2017	1 Year

3.2. For Radiated Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	EMI Test Receiver	Rohde & Schwarz	ESR3	1316.3003K03-10 1706-HN	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	EMI Test Receiver	Rohde & Schwarz	ESR3	1316.3003K03-10 1707-Z1	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Pre-Amplifier	Lunar EM	LNA10M1G-40	J1011130912001	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Pre-Amplifier	Lunar EM	LNA10M1G-40	J1011131126002	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Bilog Antenna	Schwarzbeck	VULB9163	659	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Bilog Antenna	Schwarzbeck	VULB9163	661	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Cable	Times Microwave	LMR-240 N-N 1m	SS26-P1	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Cable	Times Microwave	LMR-240 N-N 1m	SS26-P2	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Cable	Times Microwave	LMR-240 N-N 1.5m	N/A	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Cable	Times Microwave	LMR-240 N-N 1.5m	N/A	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Cable	Times Microwave	LMR-240 N-N 12m	N/A	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Cable	Times Microwave	LMR-240 N-N 11m	N/A	May 21, 2017	1 Year

3.3. For Harmonic Current / Flicker Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Proflin 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	May 20, 2017	1 Year

3.4. For Electrostatic Discharge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	ESD Tester	TESEQ AG	NSG 438A	130	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Impulse Module	TESEQ AG	IN NSG 438A A 4380-150pF/330Ohm	403-550/1712	May 21, 2017	1 Year

3.5. For RF Strength Susceptibility Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Signal Generator	Agilent	N5181A	MY50145187	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Field Strength Meter	DARE	RSS1006A	10I00037SO 22	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Power Amplifier	MILMEGA	80RF1000-175	1059345	May 20, 2017	1 Year
<input type="checkbox"/>	Power Amplifier	MILMEGA	AS0102-55	1018770	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Power Amplifier	MILMEGA	AS1860-50	1059346	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	811	May 21, 2017	1 Year
<input type="checkbox"/>	Broad-Band Horn Antenna	SCHWARZBECK	STLP 9149	9149-227	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Multi-function interface system	DARE	CTR1009B	12I00250SN O72	N/A	N/A
<input checked="" type="checkbox"/>	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A

3.6. For Electrical Fast Transient/Burst Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Burst Tester	HAEFELY	PEFT4010	080981-16	May 21, 2017	1Year
<input type="checkbox"/>	Coupling Clamp	HAEFELY	IP-4A	147147	May 21, 2017	1Year
<input checked="" type="checkbox"/>	Three phase CDN	Teseq	CDN 163	202	May 21, 2017	1 Year

3.7. For Surge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Surge Controller	HAEFELY	Psurge 8000	174031	May 21, 2017	1Year
<input checked="" type="checkbox"/>	Impulse Module	HAEFELY	PIM 100	174124	May 21, 2017	1Year
<input checked="" type="checkbox"/>	Coupling Decoupling Filter	HAEFELY	PCD 130	172181	May 21, 2017	1Year
<input type="checkbox"/>	Coupling Module	HAEFELY	PCD122	174354	May 21, 2017	1Year
<input type="checkbox"/>	Surge Impulse Module	HAEFELY	PIM 120	174435	May 21, 2017	1Year
<input type="checkbox"/>	Coupling Module	HAEFELY	PCD 126A	174387	May 21, 2017	1Year
<input type="checkbox"/>	Impulse Module	HAEFELY	PIM 110	174391	May 21, 2017	1Year
<input type="checkbox"/>	Impulse Module	HAEFELY	PIM 150	178707	May 21, 2017	1Year

3.8. For Injected Current Susceptibility Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Simulator	EMTEST	CWS500C	0900-12	May 21, 2017	1Year
<input type="checkbox"/>	CDN	EMTEST	CDN-M2	5100100100	May 21, 2017	1Year
<input checked="" type="checkbox"/>	CDN	EMTEST	CDN-M3	0900-11	May 21, 2017	1Year
<input type="checkbox"/>	Injection Clamp	EMTEST	F-2031-23MM	368	May 21, 2017	1Year
<input checked="" type="checkbox"/>	Attenuator	EMTEST	ATT6	0010222A	May 21, 2017	1Year
<input checked="" type="checkbox"/>	Three phase CDN	Teseq	CDN M332S	32655	May 21, 2017	1 Year

3.9. For Magnetic Field Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 20, 2017	1Year

3.10. For Voltage Dips and Interruptions Test

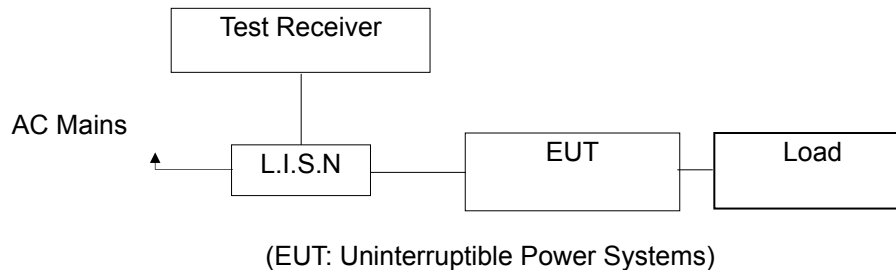
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Proflin 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	May 20, 2017	1 Year

3.11. Low Frequency Signals and Power Line Unbalance Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Programmable AC Source	CHROMA	6530	/	May 21, 2017	1Year

4. CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



4.2. Measuring Standard

EN62040-2: 2006, Category C3

4.3. Power Line Conducted Emission Limits (C3)

UPS rated output current A	Frequency range MHz	Limits dB (μV)	
		Quasi-peak	Average
>16 – 100	0,15 to 0,50 ^b	100	90
	0,50 to 5,0 ^b	86	76
	5,0 to 30,0	90 to 70 ^a	80 to 60 ^a
>100	0,15 to 0,50 ^b	130	120
	0,50 to 5,0 ^b	125	115
	5,0 to 30,0	115	105

^a The limits decrease linearly with the logarithm of the frequency.
^b The lower limit shall apply at the transition frequency.

4.4. EUT Configuration of Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN 62040-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

Uninterruptible Power Systems (EUT)
 Model Number : HR33025CL
 Serial Number : N/A

4.5. Operating Condition of EUT

- 4.5.1. Setup the EUT as shown on Section 4.1.
- 4.5.2. Turn on the power of all equipment.
- 4.5.3. Let the EUT work in measuring mode (Line mode, Bat mode) and measure it.

4.6. Test Procedure

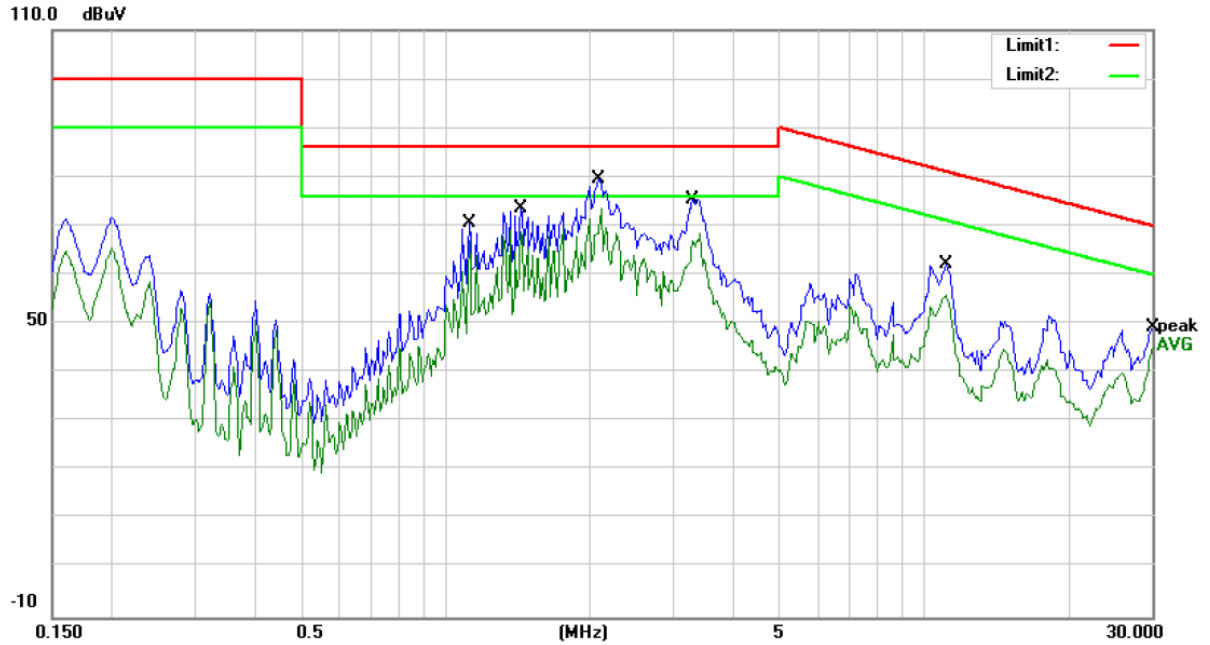
The EUT is put on the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN62040-2 regulations during conducted emission measurement. The bandwidth of the field strength meter (R&S Test Receiver ESCS30) is set at 9kHz in 150kHz~30MHz and 200Hz in 9kHz~150kHz.

The frequency range from 150kHz to 30MHz is investigated.
All the modes were tested and the data of the worsted mode(Bat mode)are attached in the following pages.

4.7. Measuring Results

PASS.

Please refer to the following pages.



Site :10m Chamber #1

Phase: **L1**

Temperature: 22

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

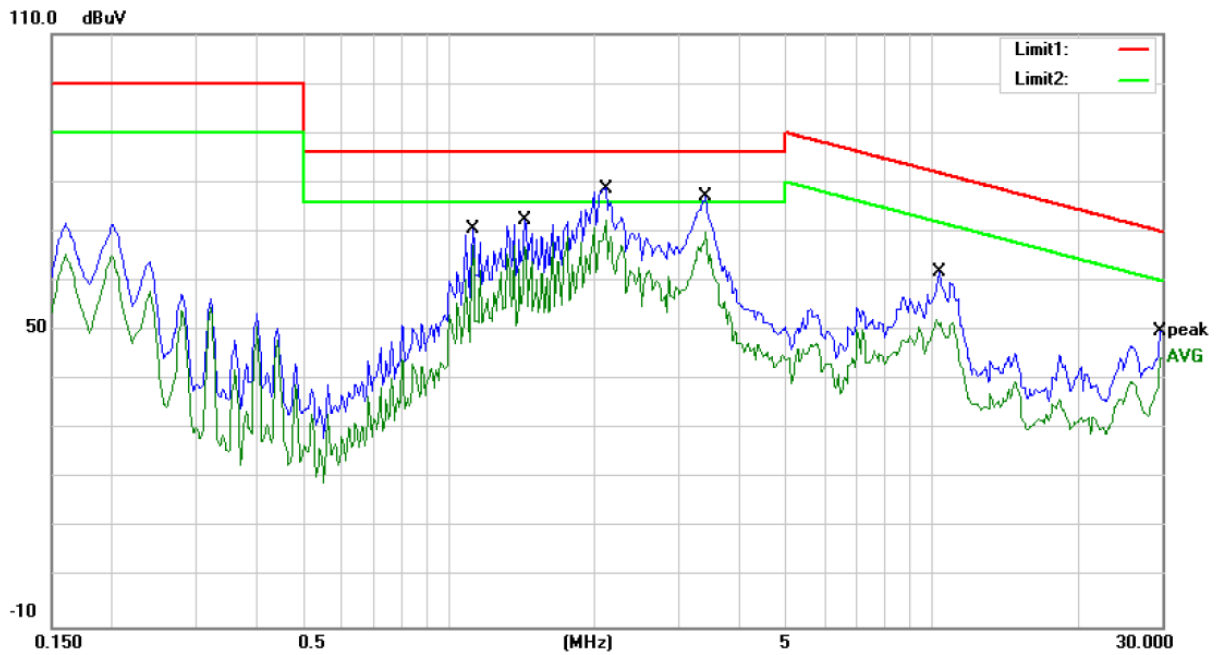
Humidity: 55 %

Mode: BAT MODE

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		1.1200	70.51	0.00	70.51	86.00	-15.49	QP	
2		1.1200	67.07	0.00	67.07	76.00	-8.93	AVG	
3		1.4400	73.56	0.00	73.56	86.00	-12.44	QP	
4		1.4400	69.05	0.00	69.05	76.00	-6.95	AVG	
5		2.0800	79.50	0.00	79.50	86.00	-6.50	QP	
6	*	2.0800	73.66	0.00	73.66	76.00	-2.34	AVG	
7		3.2800	75.48	0.00	75.48	86.00	-10.52	QP	
8		3.2800	68.41	0.00	68.41	76.00	-7.59	AVG	
9		11.1250	62.20	0.00	62.20	81.07	-18.87	QP	
10		11.1250	55.89	0.00	55.89	71.07	-15.18	AVG	
11		30.0000	49.20	0.00	49.20	70.00	-20.80	QP	
12		30.0000	45.42	0.00	45.42	60.00	-14.58	AVG	

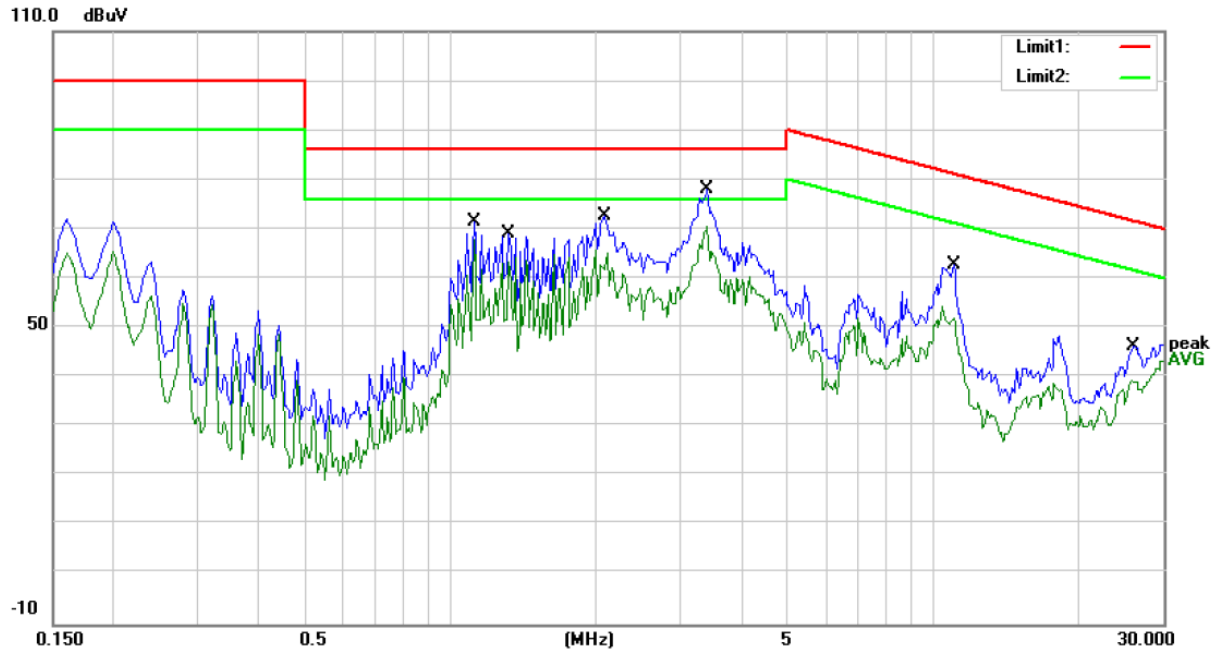
*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: CSL



Site :10m Chamber #1 Phase: **L2** Temperature: 22
 Limit: (CE)EN62040-2 C3_QP Power: AC 380V/50Hz Humidity: 55 %
 Mode: BAT MODE
 Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	1.1200	70.64	0.00	70.64	86.00	-15.36	QP	
2	1.1200	67.13	0.00	67.13	76.00	-8.87	AVG	
3	1.4400	72.36	0.00	72.36	86.00	-13.64	QP	
4	1.4400	67.36	0.00	67.36	76.00	-8.64	AVG	
5	2.1200	78.80	0.00	78.80	86.00	-7.20	QP	
6 *	2.1200	72.46	0.00	72.46	76.00	-3.54	AVG	
7	3.4000	77.03	0.00	77.03	86.00	-8.97	QP	
8	3.4000	69.88	0.00	69.88	76.00	-6.12	AVG	
9	10.3750	61.76	0.00	61.76	81.85	-20.09	QP	
10	10.3750	52.28	0.00	52.28	71.85	-19.57	AVG	
11	29.8000	49.91	0.00	49.91	70.07	-20.16	QP	
12	29.8000	44.40	0.00	44.40	60.07	-15.67	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: CSL



Site :10m Chamber #1

Phase: **L3**

Temperature: 22

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

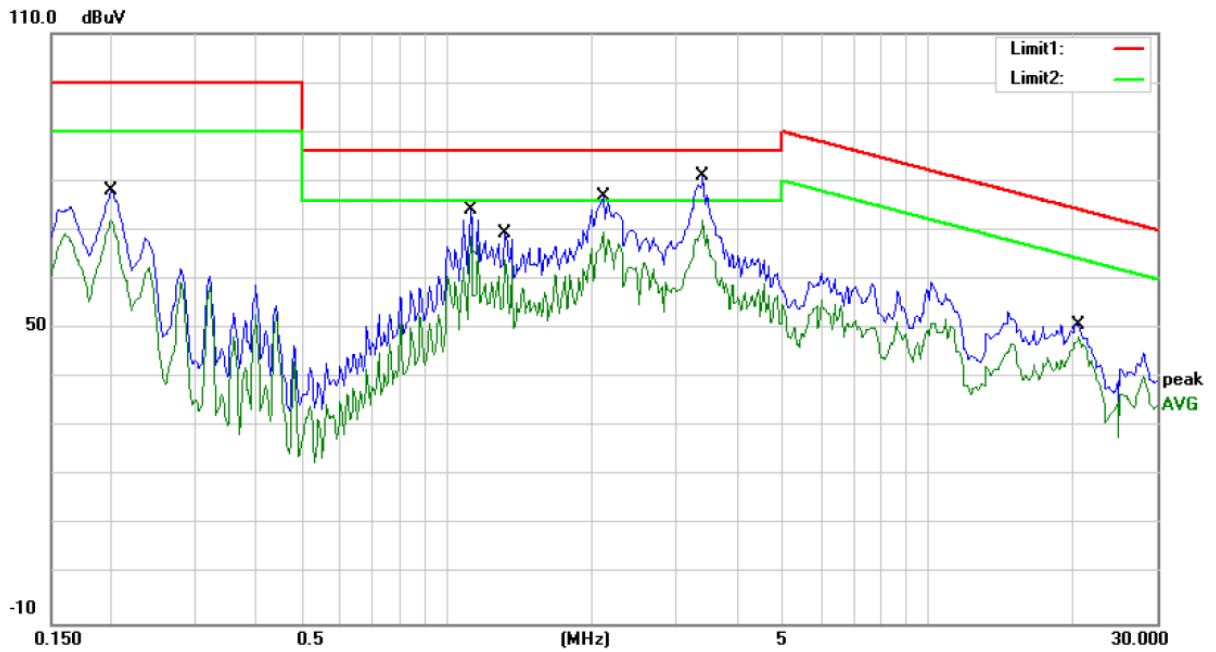
Humidity: 55 %

Mode: BAT MODE

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		1.1200	71.49	0.00	71.49	86.00	-14.51	QP	
2		1.1200	67.72	0.00	67.72	76.00	-8.28	AVG	
3		1.3200	69.16	0.00	69.16	86.00	-16.84	QP	
4		1.3200	64.21	0.00	64.21	76.00	-11.79	AVG	
5		2.0800	72.66	0.00	72.66	86.00	-13.34	QP	
6		2.0800	65.66	0.00	65.66	76.00	-10.34	AVG	
7		3.4000	78.01	0.00	78.01	86.00	-7.99	QP	
8	*	3.4000	70.57	0.00	70.57	76.00	-5.43	AVG	
9		11.0500	62.66	0.00	62.66	81.15	-18.49	QP	
10		11.0500	54.48	0.00	54.48	71.15	-16.67	AVG	
11		26.0000	46.13	0.00	46.13	71.60	-25.47	QP	
12		26.0000	39.26	0.00	39.26	61.60	-22.34	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: CSL



Site :10m Chamber #1

Phase: **N**

Temperature: 22

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

Humidity: 55 %

Mode: BAT MODE

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2000	78.09	0.00	78.09	100.00	-21.91	QP	
2		0.2000	72.19	0.00	72.19	90.00	-17.81	AVG	
3		1.1200	74.03	0.00	74.03	86.00	-11.97	QP	
4		1.1200	68.75	0.00	68.75	76.00	-7.25	AVG	
5		1.3200	69.41	0.00	69.41	86.00	-16.59	QP	
6		1.3200	63.89	0.00	63.89	76.00	-12.11	AVG	
7		2.1200	76.88	0.00	76.88	86.00	-9.12	QP	
8		2.1200	69.66	0.00	69.66	76.00	-6.34	AVG	
9		3.4000	80.94	0.00	80.94	86.00	-5.06	QP	
10	*	3.4000	72.05	0.00	72.05	76.00	-3.95	AVG	
11		20.6500	50.76	0.00	50.76	74.17	-23.41	QP	
12		20.6500	48.22	0.00	48.22	64.17	-15.95	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: CSL

5. RADIATED EMISSION MEASUREMENT

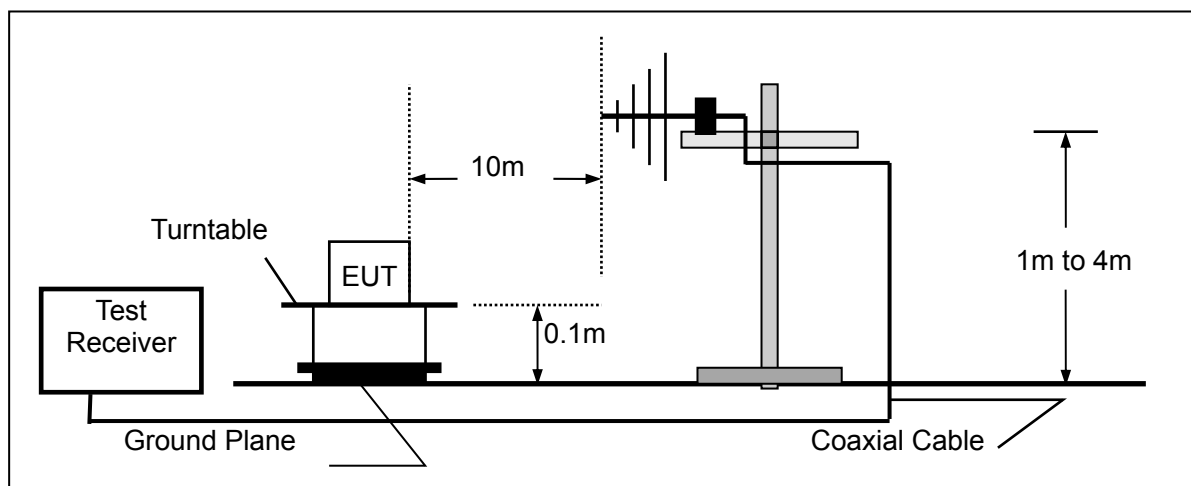
5.1. Block Diagram of Test

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Uninterruptible Power Systems)

5.1.2. Block diagram of test setup (In chamber)



(EUT: Uninterruptible Power Systems)

5.2. Measuring Standard

EN62040-2: 2006 Category C3

5.3. Radiated Emission Limits(C3)

All emanations from a C3 device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30 ~ 230	10	50
230 ~ 1000	10	60

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4. EUT Configuration on Test

The EN 62040-2 regulations test method must be used to find the maximum emission during radiated emission measurement.

5.5. Operating Condition of EUT

5.5.1. Turn on the power.

5.5.2. After that, let the EUT work in test mode (Line mode, Bat mode) and measure it.

5.6. Test Procedure

The EUT is placed on a turn table which is 0.1 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 10 meters away from the receiving antenna which is mounted on an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

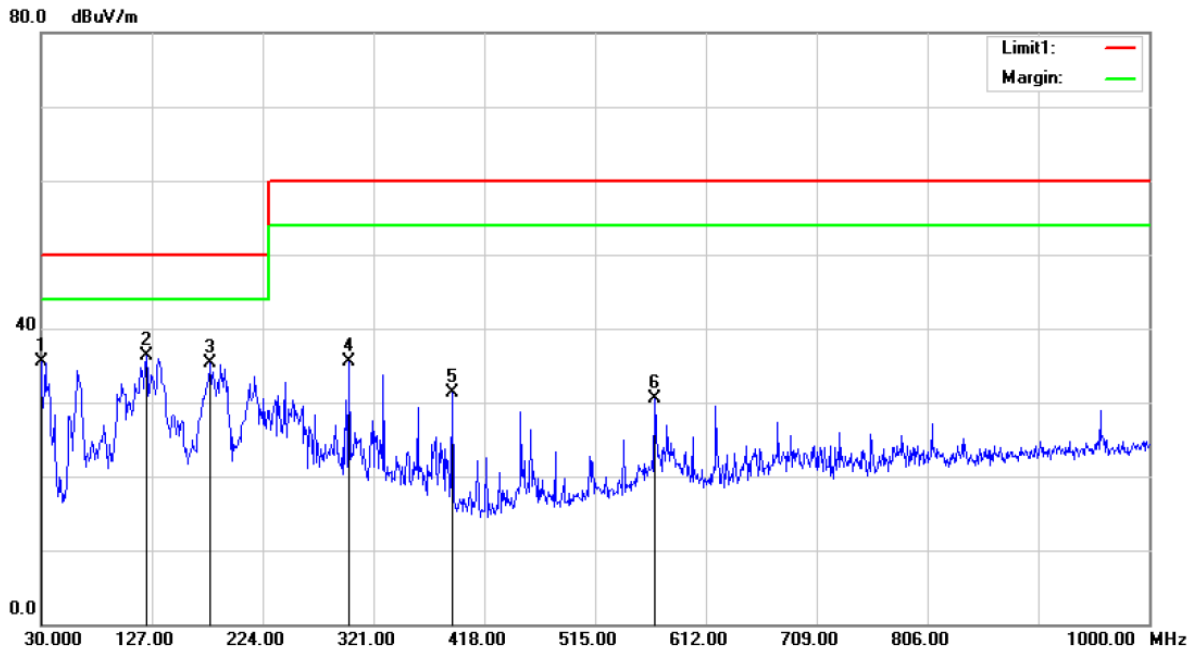
The bandwidth of the Receiver is set at 120kHz.

All the modes were tested and the data of the worsted mode (Line mode) are attached in the following pages.

5.7. Measuring Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated.

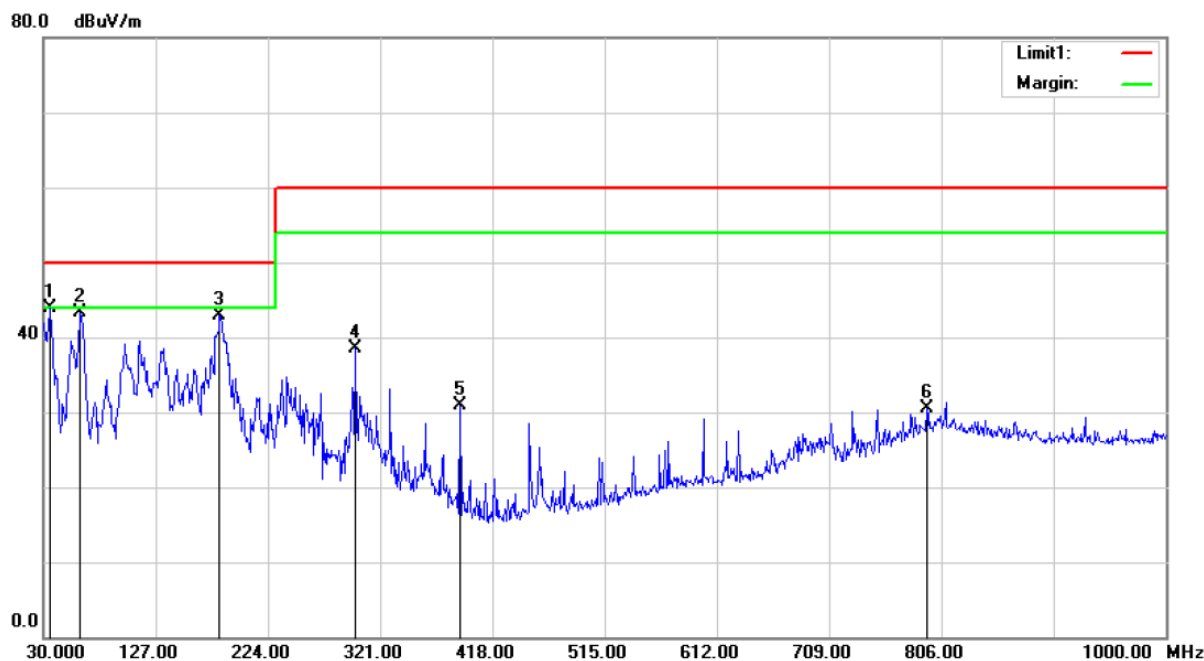


Site :10m Chamber #1 Polarization: *Horizontal* Temperature: 26
 Limit: (RE 10M)EN62040-2 C3 Power: AC 380V/50Hz Humidity: 60 %
 Mode:line MODE
 Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1		30.0000	67.01	-31.52	35.49	50.00	-14.51	QP		
2	*	122.1500	69.14	-32.89	36.25	50.00	-13.75	QP		
3		178.4100	67.71	-32.41	35.30	50.00	-14.70	QP		
4		299.6600	62.04	-26.54	35.50	60.00	-24.50	QP		
5		389.8700	54.98	-23.60	31.38	60.00	-28.62	QP		
6		567.3800	50.20	-19.61	30.59	60.00	-29.41	QP		

*:Maximum data x:Over limit !:over margin

Operator: CSL



Site :10m Chamber #1

Polarization: **Vertical**

Temperature: 26

Limit: (RE 10M)EN62040-2 C3

Power: AC 380V/50Hz

Humidity: 60 %

Mode:line MODE

Note:

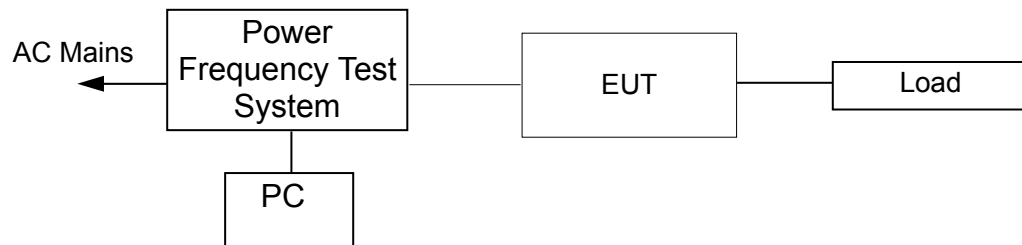
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	35.8200	75.71	-31.77	43.94	50.00	-6.06			
2		62.0100	72.98	-29.60	43.38	50.00	-6.62			
3		182.2900	74.03	-31.12	42.91	50.00	-7.09			
4		299.6600	63.47	-24.97	38.50	60.00	-21.50			
5		389.8700	53.48	-22.67	30.81	60.00	-29.19			
6		793.3900	40.44	-9.97	30.47	60.00	-29.53			

*:Maximum data x:Over limit !:over margin

Operator: CSL

6. HARMONIC CURRENT EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



(EUT: Uninterruptible Power Systems)

6.2. Measuring Standard

EN 61000-3-12: 2011

6.3. Operation Condition of EUT

Same as Section 4.4, except the test setup replaced as Section 6.1.

6.4. Measuring Results

PASS.

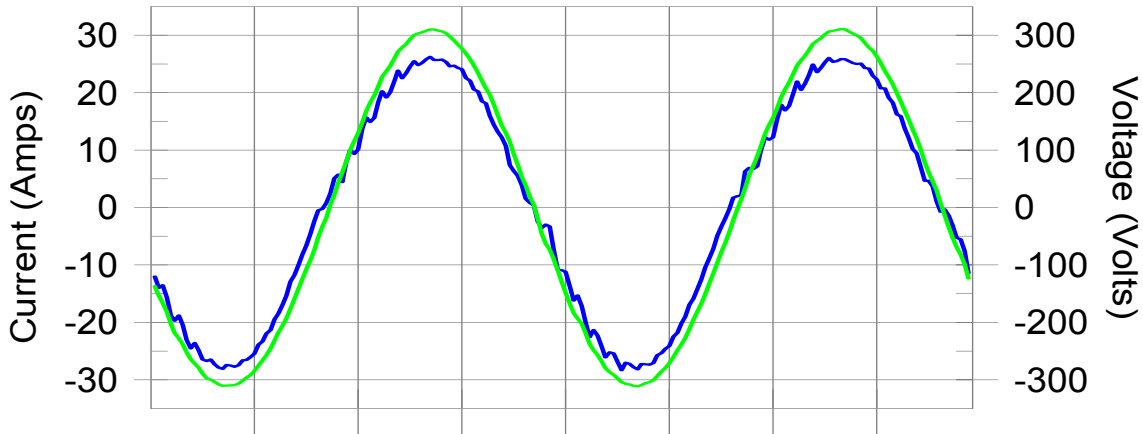
Please see the following pages.

Harmonics – Per EN/IEC61000-3-12(Phase A-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

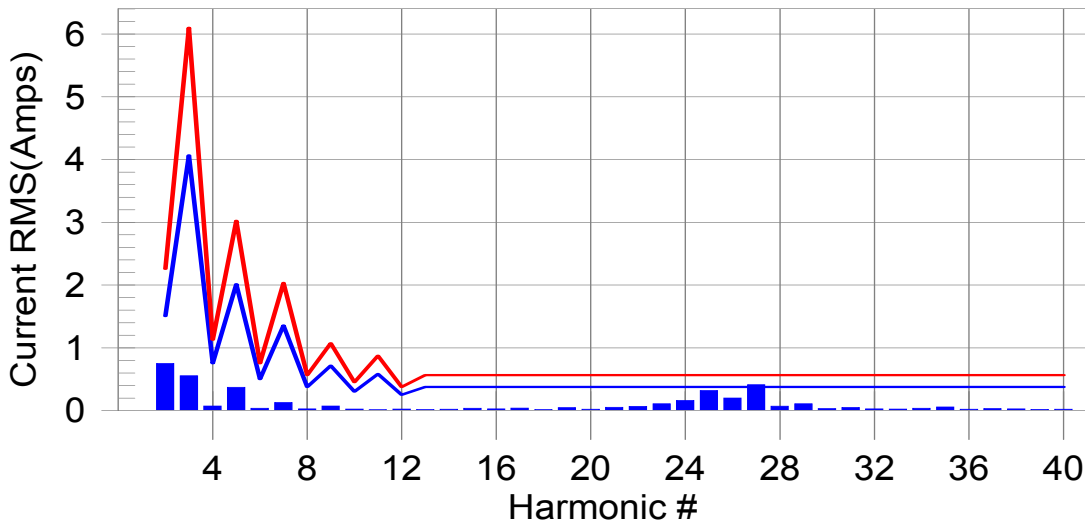
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 2 limit line

European Limits



Test result: Pass Worst harmonic was #2 with 49.79 % of the limit.

Current Test Result Summary (Phase A-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Measured I-ref: 18.792 Amp rms Source: Normal
 I-THC(%): 6.3 Limit(%): 23.0 PWHC(%): 17.1 PWHC Limit(%): 23.0

Highest parameter values during test:

V _{RMS} (Volts):	219.64	Frequency(Hz):	50.00
I _{Peak} (Amps):	28.941	I _{RMS} (Amps):	18.923
I _{Fund} (Amps):	18.792	Crest Factor:	1.537
Power (Watts):	5146	Power Factor:	0.998

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.751	1.506	49.8	0.770	2.260	34.1	Pass
3	0.555	4.067	13.6	0.570	6.101	9.3	Pass
4	0.072	0.753	9.5	0.077	1.130	6.8	Pass
5	0.371	2.015	18.4	0.377	3.022	12.5	Pass
6	0.038	0.502	7.6	0.040	0.753	5.3	Pass
7	0.129	1.356	9.5	0.134	2.034	6.6	Pass
8	0.026	0.377	7.0	0.028	0.565	5.0	Pass
9	0.073	0.716	10.2	0.077	1.073	7.1	Pass
10	0.025	0.301	8.4	0.027	0.452	6.0	Pass
11	0.014	0.584	2.4	0.018	0.876	2.0	Pass
12	0.024	0.251	9.5	0.025	0.377	6.8	Pass
13	0.018	0.377	4.8	0.023	0.565	4.0	Pass
14	0.022	N/A	N/A	0.024	N/A	N/A	N/A
15	0.038	N/A	N/A	0.041	N/A	N/A	N/A
16	0.027	N/A	N/A	0.030	N/A	N/A	N/A
17	0.040	N/A	N/A	0.042	N/A	N/A	N/A
18	0.018	N/A	N/A	0.022	N/A	N/A	N/A
19	0.047	N/A	N/A	0.049	N/A	N/A	N/A
20	0.022	N/A	N/A	0.027	N/A	N/A	N/A
21	0.052	N/A	N/A	0.056	N/A	N/A	N/A
22	0.067	N/A	N/A	0.078	N/A	N/A	N/A
23	0.110	N/A	N/A	0.119	N/A	N/A	N/A
24	0.162	N/A	N/A	0.191	N/A	N/A	N/A
25	0.320	N/A	N/A	0.352	N/A	N/A	N/A
26	0.201	N/A	N/A	0.243	N/A	N/A	N/A
27	0.412	N/A	N/A	0.441	N/A	N/A	N/A
28	0.071	N/A	N/A	0.080	N/A	N/A	N/A
29	0.110	N/A	N/A	0.119	N/A	N/A	N/A
30	0.033	N/A	N/A	0.038	N/A	N/A	N/A
31	0.051	N/A	N/A	0.055	N/A	N/A	N/A
32	0.028	N/A	N/A	0.033	N/A	N/A	N/A
33	0.025	N/A	N/A	0.030	N/A	N/A	N/A
34	0.038	N/A	N/A	0.041	N/A	N/A	N/A
35	0.057	N/A	N/A	0.060	N/A	N/A	N/A
36	0.022	N/A	N/A	0.024	N/A	N/A	N/A
37	0.033	N/A	N/A	0.036	N/A	N/A	N/A
38	0.028	N/A	N/A	0.030	N/A	N/A	N/A
39	0.020	N/A	N/A	0.022	N/A	N/A	N/A
40	0.023	N/A	N/A	0.025	N/A	N/A	N/A

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

Voltage Source Verification Data (Phase A-Run time)

EUT: Uninterruptible Power Systems **Tested by: ZCJ**
Test category: Table:2, R_{sce}=33, Inter-Harm, **Test Margin: 100**
Test date: 2017/8/27 **Start time: 14:41:29** **End time: 14:44:22**
Test duration (min): 2.5 **Data file name: WIN2106_H-000342.cts_data**
Comment: LINE MODE
Customer: INVT

Test Result: Pass **Source qualification: Normal**
Measured source distortion is within the requirements of the standards
Measurements are compliant with IEC/EN61000-3-12 Ed.2 (2011) & IEC/EN61000-4-7

Highest parameter values during test:

Voltage (Vrms): 219.64	Frequency(Hz): 50.00
I_Peak (Amps): 28.941	I_RMS (Amps): 18.923
I_Fund (Amps): 18.792	Crest Factor: 1.537
Power (Watts): 5146	Power Factor: 0.998

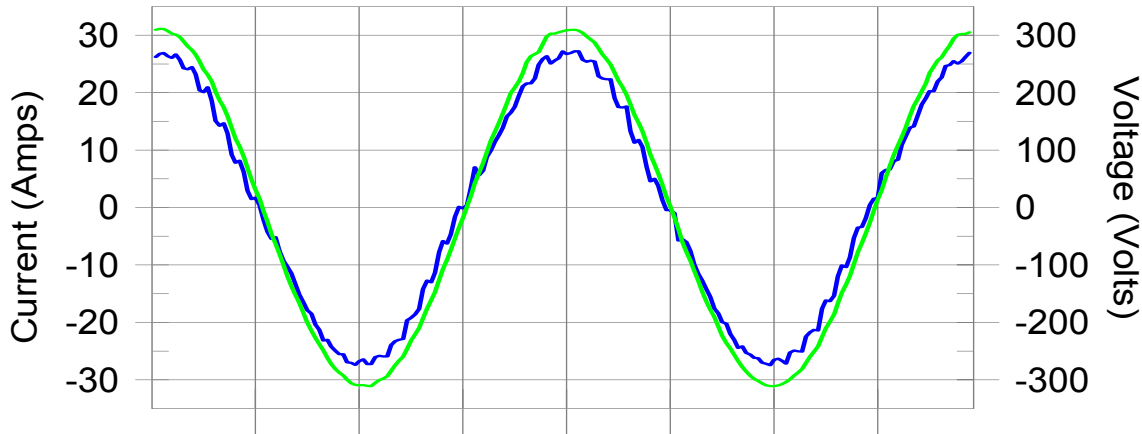
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.302	0.878	34.42	OK
3	0.234	2.742	8.55	OK
4	0.043	0.878	4.94	OK
5	0.091	3.292	2.77	OK
6	0.029	0.878	3.30	OK
7	0.114	2.743	4.16	OK
8	0.026	0.878	2.96	OK
9	0.134	1.316	10.21	OK
10	0.028	0.878	3.13	OK
11	0.133	1.536	8.66	OK
12	0.026	0.658	3.92	OK
13	0.126	1.317	9.54	OK
14	0.026	0.658	3.96	OK
15	0.128	0.658	19.49	OK
16	0.038	0.658	5.78	OK
17	0.121	0.658	18.35	OK
18	0.031	0.659	4.67	OK
19	0.115	0.658	17.52	OK
20	0.040	0.658	6.15	OK
21	0.089	0.658	13.58	OK
22	0.062	0.658	9.38	OK
23	0.180	0.658	27.37	OK
24	0.084	0.659	12.81	OK
25	0.290	0.658	44.09	OK
26	0.101	0.659	15.37	OK
27	0.393	0.658	59.67	OK
28	0.079	0.659	12.03	OK
29	0.127	0.658	19.22	OK
30	0.039	0.658	5.97	OK
31	0.052	0.658	7.95	OK
32	0.046	0.658	7.00	OK
33	0.058	0.658	8.78	OK
34	0.071	0.658	10.85	OK
35	0.072	0.658	11.00	OK
36	0.050	0.659	7.64	OK
37	0.067	0.658	10.22	OK
38	0.061	0.659	9.32	OK
39	0.055	0.659	8.29	OK
40	0.055	0.658	8.39	OK

Harmonics – Per EN/IEC61000-3-12(Phase B-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

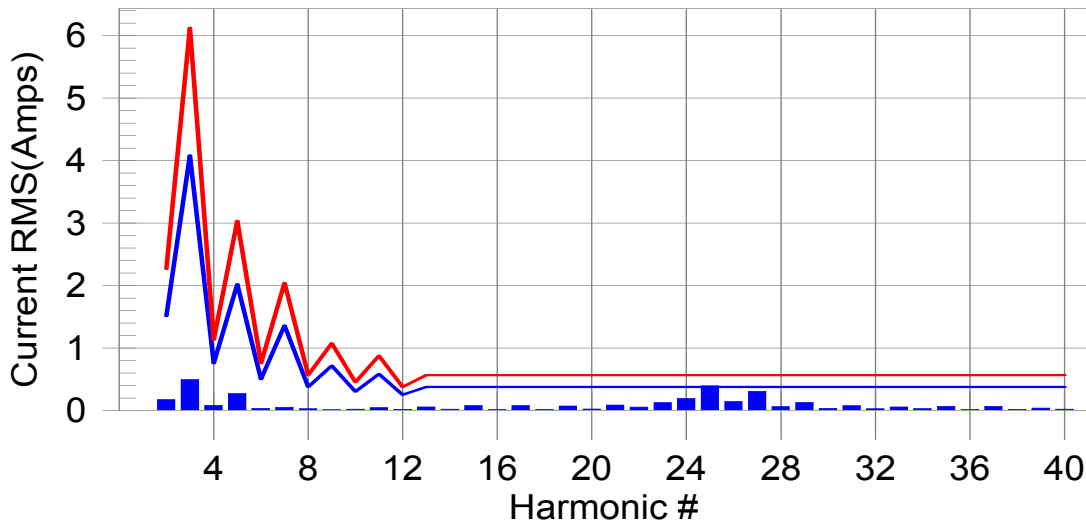
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 2 limit line

European Limits



Test result: Pass Worst harmonic was #13 with 16.16 % of the limit.

Current Test Result Summary (Phase B-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Measured I-ref: 18.889 Amp rms Source: Normal
 I-THC(%): 4.6 Limit(%): 23.0 PWHC(%): 17.0 PWHC Limit(%): 23.0

Highest parameter values during test:

V _{RMS} (Volts):	219.59	Frequency(Hz):	50.00
I _{Peak} (Amps):	28.408	I _{RMS} (Amps):	18.996
I _{Fund} (Amps):	18.889	Crest Factor:	1.498
Power (Watts):	5163	Power Factor:	0.998

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.177	1.513	11.7	0.190	2.269	8.4	Pass
3	0.495	4.084	12.1	0.511	6.127	8.3	Pass
4	0.083	0.756	10.9	0.088	1.135	7.7	Pass
5	0.273	2.023	13.5	0.279	3.035	9.2	Pass
6	0.034	0.504	6.7	0.036	0.756	4.7	Pass
7	0.055	1.361	4.0	0.059	2.042	2.9	Pass
8	0.030	0.378	8.1	0.033	0.567	5.9	Pass
9	0.015	0.719	2.1	0.019	1.078	1.7	Pass
10	0.022	0.303	7.3	0.024	0.454	5.4	Pass
11	0.048	0.586	8.2	0.051	0.879	5.8	Pass
12	0.020	0.252	7.8	0.022	0.378	5.9	Pass
13	0.059	0.378	15.7	0.063	0.567	11.1	Pass
14	0.021	N/A	N/A	0.023	N/A	N/A	N/A
15	0.081	N/A	N/A	0.085	N/A	N/A	N/A
16	0.017	N/A	N/A	0.021	N/A	N/A	N/A
17	0.082	N/A	N/A	0.085	N/A	N/A	N/A
18	0.020	N/A	N/A	0.024	N/A	N/A	N/A
19	0.074	N/A	N/A	0.077	N/A	N/A	N/A
20	0.024	N/A	N/A	0.030	N/A	N/A	N/A
21	0.090	N/A	N/A	0.096	N/A	N/A	N/A
22	0.056	N/A	N/A	0.067	N/A	N/A	N/A
23	0.127	N/A	N/A	0.134	N/A	N/A	N/A
24	0.194	N/A	N/A	0.233	N/A	N/A	N/A
25	0.395	N/A	N/A	0.427	N/A	N/A	N/A
26	0.144	N/A	N/A	0.176	N/A	N/A	N/A
27	0.308	N/A	N/A	0.333	N/A	N/A	N/A
28	0.064	N/A	N/A	0.073	N/A	N/A	N/A
29	0.130	N/A	N/A	0.140	N/A	N/A	N/A
30	0.035	N/A	N/A	0.047	N/A	N/A	N/A
31	0.079	N/A	N/A	0.085	N/A	N/A	N/A
32	0.030	N/A	N/A	0.036	N/A	N/A	N/A
33	0.059	N/A	N/A	0.064	N/A	N/A	N/A
34	0.032	N/A	N/A	0.039	N/A	N/A	N/A
35	0.070	N/A	N/A	0.073	N/A	N/A	N/A
36	0.018	N/A	N/A	0.023	N/A	N/A	N/A
37	0.070	N/A	N/A	0.075	N/A	N/A	N/A
38	0.020	N/A	N/A	0.023	N/A	N/A	N/A
39	0.042	N/A	N/A	0.045	N/A	N/A	N/A
40	0.023	N/A	N/A	0.025	N/A	N/A	N/A

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

Voltage Source Verification Data (Phase B-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Source qualification: Normal
 Measured source distortion is within the requirements of the standards
 Measurements are compliant with IEC/EN61000-3-12 Ed.2 (2011) & IEC/EN61000-4-7

Highest parameter values during test:

Voltage (Vrms):	219.59	Frequency(Hz):	50.00
I_Peak (Amps):	28.408	I_RMS (Amps):	18.996
I_Fund (Amps):	18.889	Crest Factor:	1.498
Power (Watts):	5163	Power Factor:	0.998

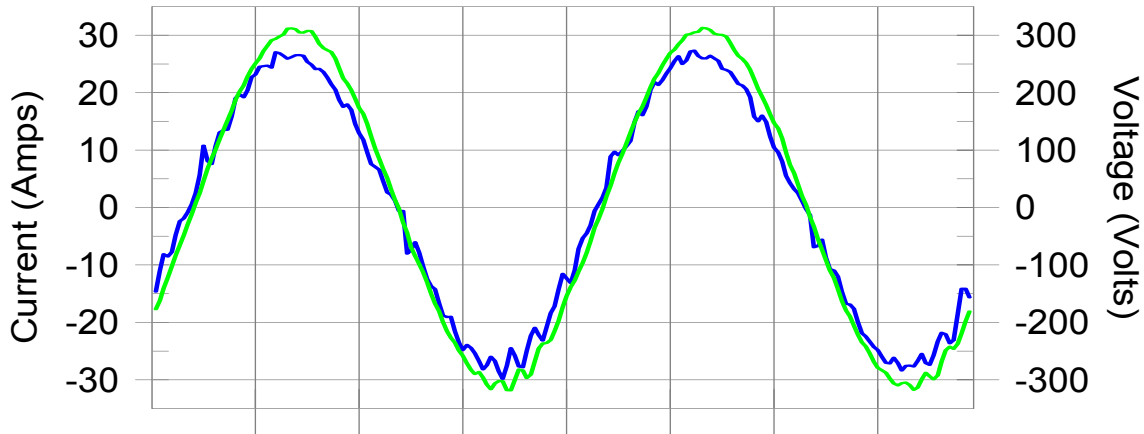
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.306	0.878	34.87	OK
3	0.217	2.744	7.91	OK
4	0.055	0.878	6.24	OK
5	0.106	3.292	3.23	OK
6	0.028	0.878	3.15	OK
7	0.138	2.743	5.04	OK
8	0.035	0.878	3.99	OK
9	0.158	1.317	12.03	OK
10	0.026	0.878	2.92	OK
11	0.160	1.536	10.43	OK
12	0.021	0.658	3.24	OK
13	0.156	1.317	11.81	OK
14	0.028	0.658	4.27	OK
15	0.157	0.658	23.77	OK
16	0.022	0.658	3.39	OK
17	0.140	0.658	21.25	OK
18	0.035	0.658	5.35	OK
19	0.120	0.658	18.26	OK
20	0.037	0.658	5.66	OK
21	0.126	0.658	19.12	OK
22	0.056	0.659	8.52	OK
23	0.189	0.659	28.72	OK
24	0.116	0.658	17.55	OK
25	0.388	0.658	58.95	OK
26	0.069	0.659	10.48	OK
27	0.248	0.658	37.71	OK
28	0.070	0.658	10.70	OK
29	0.155	0.658	23.47	OK
30	0.049	0.658	7.50	OK
31	0.079	0.658	11.94	OK
32	0.056	0.658	8.53	OK
33	0.088	0.658	13.31	OK
34	0.062	0.658	9.43	OK
35	0.103	0.658	15.59	OK
36	0.048	0.659	7.32	OK
37	0.104	0.659	15.86	OK
38	0.053	0.658	8.01	OK
39	0.089	0.658	13.45	OK
40	0.053	0.658	8.04	OK

Harmonics – Per EN/IEC61000-3-12(Phase C-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

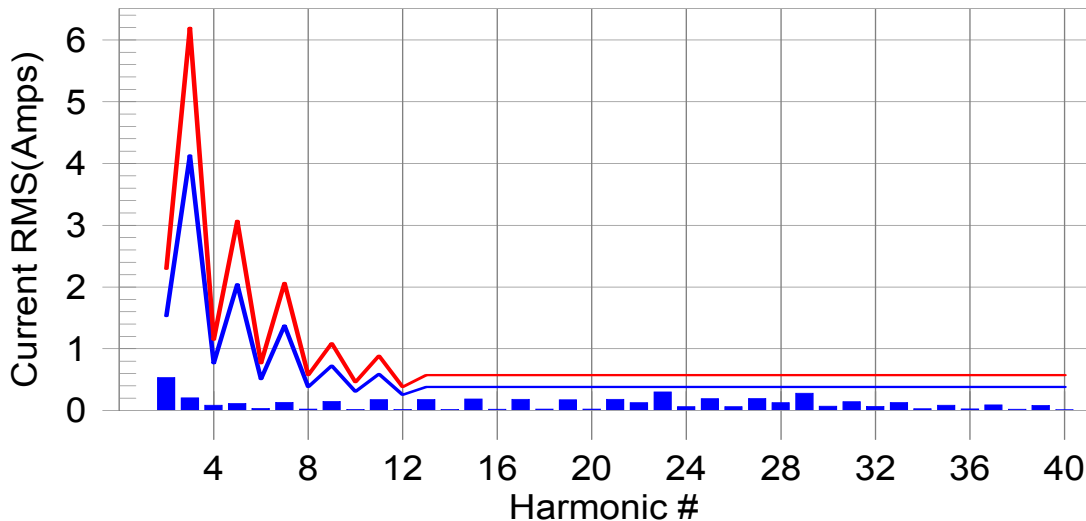
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 2 limit line

European Limits



Test result: Pass Worst harmonic was #13 with 48.65 % of the limit.

Current Test Result Summary (Phase C-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Measured I-ref: 19.104 Amp rms Source: Normal
 I-THC(%): 5.1 Limit(%): 23.0 PWHC(%): 18.4 PWHC Limit(%): 23.0

Highest parameter values during test:

V_{RMS} (Volts): 219.46 Frequency(Hz): 50.00
 I_{Peak} (Amps): 31.679 I_{RMS} (Amps): 19.232
 I_{Fund} (Amps): 19.104 Crest Factor: 1.657
 Power (Watts): 5199 Power Factor: 0.996

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.534	1.530	34.9	0.552	2.295	24.0	Pass
3	0.207	4.132	5.0	0.223	6.198	3.6	Pass
4	0.088	0.765	11.5	0.094	1.148	8.2	Pass
5	0.114	2.047	5.6	0.121	3.070	3.9	Pass
6	0.036	0.510	7.1	0.041	0.765	5.3	Pass
7	0.135	1.377	9.8	0.139	2.066	6.7	Pass
8	0.026	0.383	6.8	0.033	0.574	5.8	Pass
9	0.151	0.727	20.8	0.155	1.090	14.2	Pass
10	0.019	0.306	6.1	0.030	0.459	6.5	Pass
11	0.178	0.593	30.1	0.183	0.889	20.5	Pass
12	0.020	0.255	8.0	0.029	0.383	7.6	Pass
13	0.182	0.383	47.5	0.185	0.574	32.3	Pass
14	0.019	N/A	N/A	0.028	N/A	N/A	N/A
15	0.189	N/A	N/A	0.194	N/A	N/A	N/A
16	0.021	N/A	N/A	0.027	N/A	N/A	N/A
17	0.184	N/A	N/A	0.188	N/A	N/A	N/A
18	0.026	N/A	N/A	0.029	N/A	N/A	N/A
19	0.175	N/A	N/A	0.179	N/A	N/A	N/A
20	0.026	N/A	N/A	0.033	N/A	N/A	N/A
21	0.184	N/A	N/A	0.188	N/A	N/A	N/A
22	0.130	N/A	N/A	0.156	N/A	N/A	N/A
23	0.302	N/A	N/A	0.325	N/A	N/A	N/A
24	0.065	N/A	N/A	0.076	N/A	N/A	N/A
25	0.193	N/A	N/A	0.201	N/A	N/A	N/A
26	0.065	N/A	N/A	0.079	N/A	N/A	N/A
27	0.197	N/A	N/A	0.204	N/A	N/A	N/A
28	0.128	N/A	N/A	0.153	N/A	N/A	N/A
29	0.282	N/A	N/A	0.306	N/A	N/A	N/A
30	0.071	N/A	N/A	0.116	N/A	N/A	N/A
31	0.144	N/A	N/A	0.168	N/A	N/A	N/A
32	0.068	N/A	N/A	0.101	N/A	N/A	N/A
33	0.131	N/A	N/A	0.149	N/A	N/A	N/A
34	0.030	N/A	N/A	0.040	N/A	N/A	N/A
35	0.086	N/A	N/A	0.090	N/A	N/A	N/A
36	0.027	N/A	N/A	0.032	N/A	N/A	N/A
37	0.092	N/A	N/A	0.096	N/A	N/A	N/A
38	0.024	N/A	N/A	0.034	N/A	N/A	N/A
39	0.085	N/A	N/A	0.092	N/A	N/A	N/A
40	0.016	N/A	N/A	0.022	N/A	N/A	N/A

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

Voltage Source Verification Data (Phase C-Run time)

EUT: Uninterruptible Power Systems Tested by: ZCJ
 Test category: Table:2, R_{sce}=33, Inter-Harm, Test Margin: 100
 Test date: 2017/8/27 Start time: 14:41:29 End time: 14:44:22
 Test duration (min): 2.5 Data file name: WIN2106_H-000342.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Source qualification: Normal
 Measured source distortion is within the requirements of the standards
 Measurements are compliant with IEC/EN61000-3-12 Ed.2 (2011) & IEC/EN61000-4-7

Highest parameter values during test:

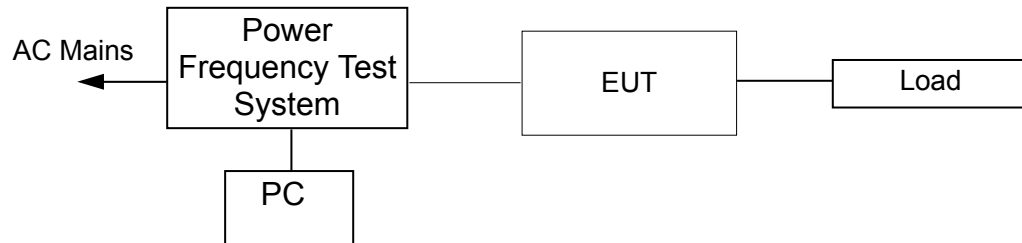
Voltage (Vrms):	219.46	Frequency(Hz):	50.00
I_Peak (Amps):	31.679	I_RMS (Amps):	19.232
I_Fund (Amps):	19.104	Crest Factor:	1.657
Power (Watts):	5199	Power Factor:	0.996

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.256	0.878	29.20	OK
3	0.212	2.742	7.71	OK
4	0.053	0.878	6.08	OK
5	0.117	3.290	3.54	OK
6	0.028	0.878	3.13	OK
7	0.185	2.742	6.76	OK
8	0.028	0.878	3.19	OK
9	0.215	1.316	16.35	OK
10	0.026	0.878	2.92	OK
11	0.230	1.536	14.98	OK
12	0.033	0.658	4.97	OK
13	0.213	1.316	16.18	OK
14	0.024	0.658	3.58	OK
15	0.218	0.658	33.12	OK
16	0.027	0.658	4.06	OK
17	0.195	0.658	29.56	OK
18	0.031	0.658	4.72	OK
19	0.189	0.658	28.73	OK
20	0.042	0.658	6.39	OK
21	0.192	0.658	29.14	OK
22	0.085	0.658	12.99	OK
23	0.305	0.658	46.34	OK
24	0.083	0.658	12.67	OK
25	0.273	0.658	41.49	OK
26	0.103	0.658	15.58	OK
27	0.297	0.658	45.09	OK
28	0.089	0.658	13.53	OK
29	0.288	0.658	43.79	OK
30	0.121	0.658	18.40	OK
31	0.184	0.658	27.88	OK
32	0.129	0.658	19.66	OK
33	0.189	0.658	28.66	OK
34	0.056	0.658	8.46	OK
35	0.123	0.658	18.64	OK
36	0.048	0.658	7.37	OK
37	0.159	0.658	24.15	OK
38	0.038	0.658	5.75	OK
39	0.154	0.658	23.43	OK
40	0.040	0.658	6.03	OK

5th Harmonic Phase Angle and Magnitude for Phase A :**H-5_min_phase : 113.9 Degree (Leading)****H-5_max_phase : 127.9 Degree (Leading)****H-5_ave_phase : 121.3 Degree (Leading)****H-5_ave_vector_magnitude : 0.112 Amp****H-5_standard_ave_magnitude : 0.371 Amp****H-5_standard_max_magnitude : 0.121 Amp****Ratio of H-5_ave_vector / H-5_standard_ave : 0.997****Phase A = 74.361% of tested Rsce = 33.000, Rsce = 24.539****Phase B = 74.091% of tested Rsce = 33.000, Rsce = 24.450****Phase C = 80.206% of tested Rsce = 33.000, Rsce = 26.468****Minimum Rsce required: Rsce = 26.468**

7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1. Block Diagram of Test Setup



(EUT: Uninterruptible Power Systems)

7.2. Measuring Standard

EN 61000-3-11: 2000

7.3. Operation Condition of EUT

Same as Section 4.4, except the test setup replaced as Section 7.1.

7.4. Measuring Results

PASS.

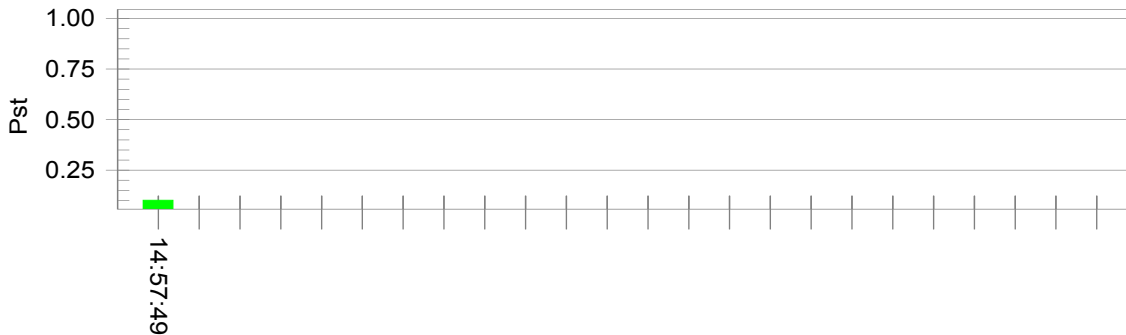
Please see the following pages.

Flicker Test Summary (Phase A-Run time) per EN/IEC61000-3-11

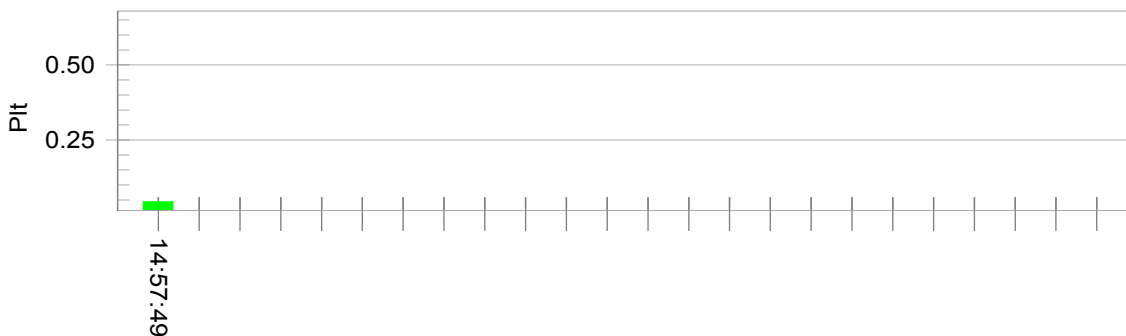
EUT: Uninterruptible Power Systems		Tested by: ZCJ
Test category: All parameters		Test Margin: 100
Test date: 2017/8/27	Start time: 14:47:17	End time: 14:57:50
Test duration (min): 10	Data file name: WIN2106_F-000343.cts_data	
Comment: LINE MODE		
Customer: INVT		
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)		

Test Result: Pass
Status: Test Completed

Pst_i and limit line



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 215.11

T-max (mS):	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.21	Test limit (%):	3.30	Pass
Highest dmax (%):	0.25	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.102	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.044	Test limit:	0.650	Pass

Calculated dmax(%): 0.300
 Calculated dc(%): 0.280

Calculated Pst : 0.136
Calculated Plt : 0.059

The maximum permissible system impedance Zsys:

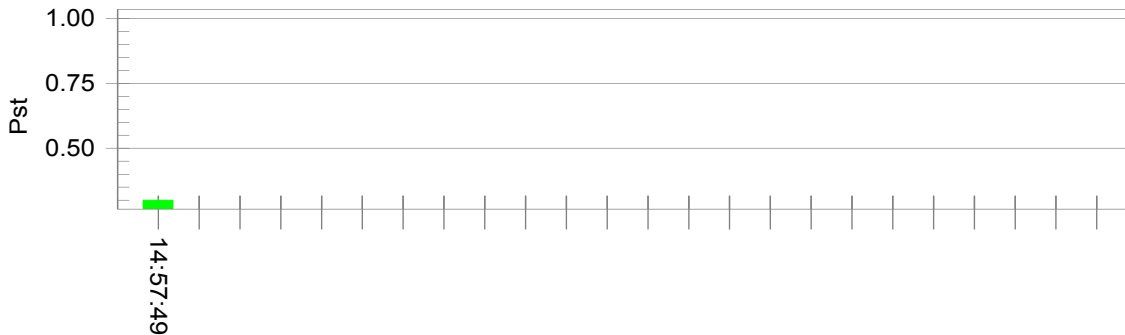
Z-phase A = 4.793 Ohm + j 2.996 Ohm (4.793 Ohm + 9535 ?H)
Z-neutral A = 3.195 Ohm + j 1.997 Ohm (3.195 Ohm + 6357 ?H)

Flicker Test Summary (Phase B-Run time) per EN/IEC61000-3-11

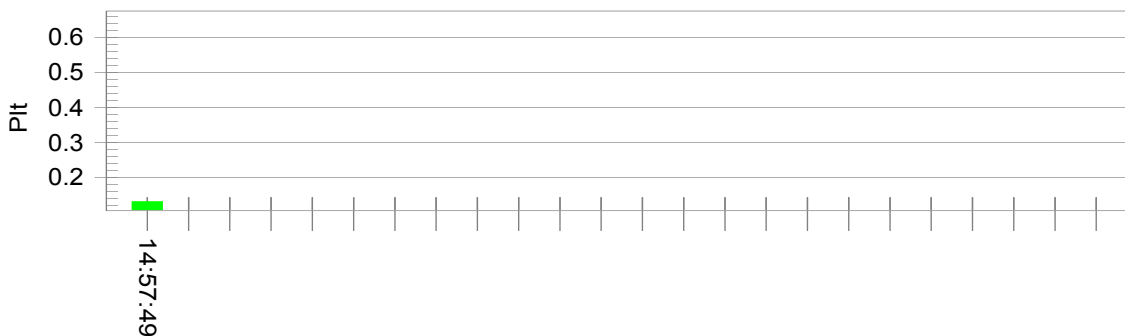
EUT: Uninterruptible Power Systems		Tested by: ZCJ
Test category: All parameters		Test Margin: 100
Test date: 2017/8/27	Start time: 14:47:17	End time: 14:57:50
Test duration (min): 10	Data file name: WIN2106_F-000343.cts_data	
Comment: LINE MODE		
Customer: INVT		
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)		

Test Result: Pass
Status: Test Completed

Pst_i and limit line



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 215.08

Time(mS) > dt:	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):	0.300	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.131	Test limit:	0.650	Pass

Calculated dmax(%): 0.000
Calculated dc(%): 0.000

Calculated Pst : 0.401
Calculated Plt : 0.175

The maximum permissible system impedance Zsys :

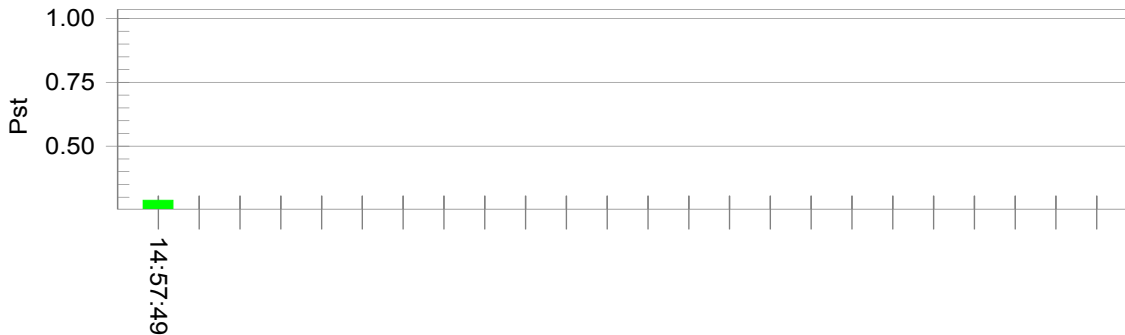
Z-phase B = 0.946 Ohm + j 0.591 Ohm (0.946 Ohm + 1882 ?H)
Z-neutral B = 0.631 Ohm + j 0.394 Ohm (0.631 Ohm + 1255 ?H)

Flicker Test Summary (Phase C-Run time) per EN/IEC61000-3-11

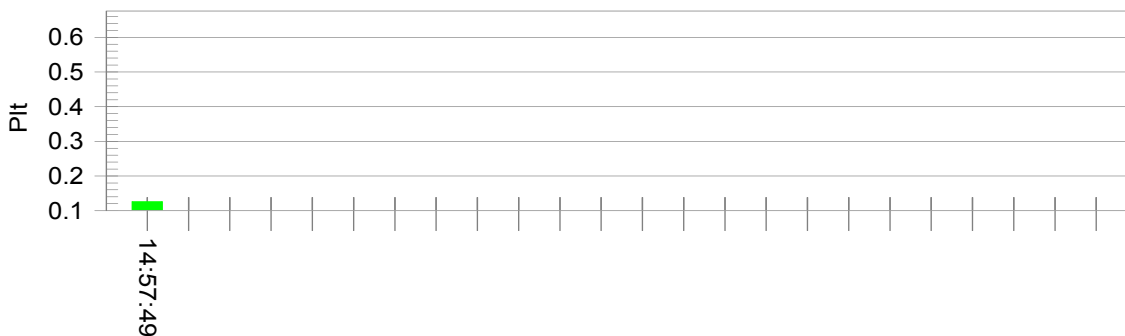
EUT: Uninterruptible Power Systems		Tested by: ZCJ
Test category: All parameters		Test Margin: 100
Test date: 2017/8/27	Start time: 14:47:17	End time: 14:57:50
Test duration (min): 10	Data file name: WIN2106_F-000343.cts_data	
Comment: LINE MODE		
Customer: INVT		
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)		

Test Result: Pass
Status: Test Completed

Pst_i and limit line



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 214.92

Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.26	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.288	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.126	Test limit:	0.650	Pass

Calculated dmax(%): 0.310
 Calculated dc(%): 0.000
 Calculated Pst : 0.385

Calculated Plt : 0.168

The maximum permissible system impedance Zsys :

Z-phase C = 1.005 Ohm + j 0.628 Ohm (1.005 Ohm + 1999 ?H)
Z-neutral C = 0.670 Ohm + j 0.419 Ohm (0.670 Ohm + 1333 ?H)

8. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION

Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

Definition: normal performance within limits specified by the manufacturer, requestor and purchaser.

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment 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, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Criterion B:

Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention.

After the test, the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.

Criterion C:

Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention.

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

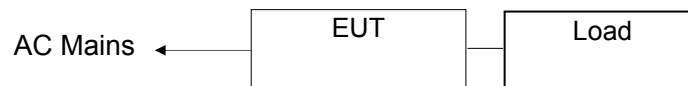
Criterion D

Definition: loss of function or degradation of performance, which is not recoverable, owing to damage to hardware or software, or loss of data.

9. ELECTROSTATIC DISCHARGE IMMUNITY TEST

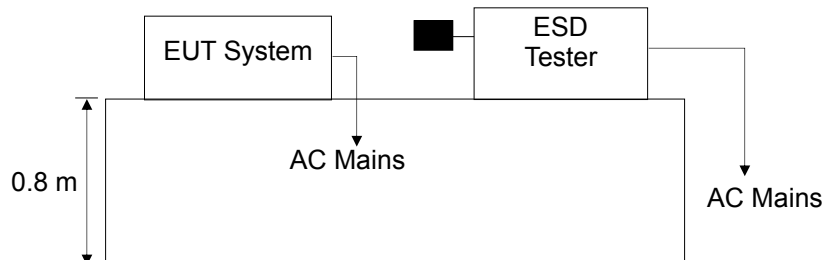
9.1. Block Diagram of Test Setup

9.1.1. Block diagram of connection between the EUT and simulators



(EUT: Uninterruptible Power Systems)

9.1.2. Block diagram of ESD test setup



(EUT: Uninterruptible Power Systems)

9.2. Test Standard

IEC 61000-4-2:2008 (Air Discharge: ± 8 kV, Contact Discharge: ± 4 kV)

9.3. Severity Levels and Performance Criterion

9.3.1. Severity level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1.	± 2	± 2
2.	± 4	± 4
3.	± 6	± 8
4.	± 8	± 15
X	Special	Special

9.3.2.Performance criterion : B

	Criterion B
Output characteristics	Voltage permitted to vary within the inverse time characteristics applicable (<100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)
External and internal indications and metering	Change only during test
Control signals to external devices	Change only temporarily in consistency with the actual Uninterruptible Power Systems mode of operation
Mode of operation	Change only temporarily

9.4. EUT Configuration

The configuration of EUT are listed in Section 4.3.

9.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.4. except the test set up replaced by Section 9.1.

9.6. Test Procedure

9.6.1.Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed

9.6.2.Contact Discharge:

All procedure shall be the same as Section 9.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.6.3.Indirect discharge for horizontal coupling plane

At least 10 single discharges(in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit(if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

9.6.4.Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.7. Test Results

PASS

Please refer to the following page.

Electrostatic Discharge Test Result

EMTEK(SHENZHEN) CO., LTD.

Applicant : INVT POWER SYSTEM(SHENZHEN) CO., LTD <hr/> EUT : Uninterruptible Power Systems <hr/> M/N : HR33025CL <hr/> Power Supply : AC 380V/50Hz <hr/> Test Mode : Line mode, Bat mode <hr/> Test Engineer : ZZY	Test Date : August 25, 2017 <hr/> Temperature : 22°C <hr/> Humidity : 50% <hr/> Actual Criterion : B <hr/> Air discharge : ±8kV <hr/> Contact discharge : ±4kV	
Location	Kind A-Air Discharge C-Contact Discharge	Result
Slot	A	A
Metal	C	A
HCP	C	A
VCP of front	C	A
VCP of rear	C	A
VCP of left	C	A
VCP of right	C	A
Test Equipment: ESD Simulator (TESEQAG, NSG 437)		

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

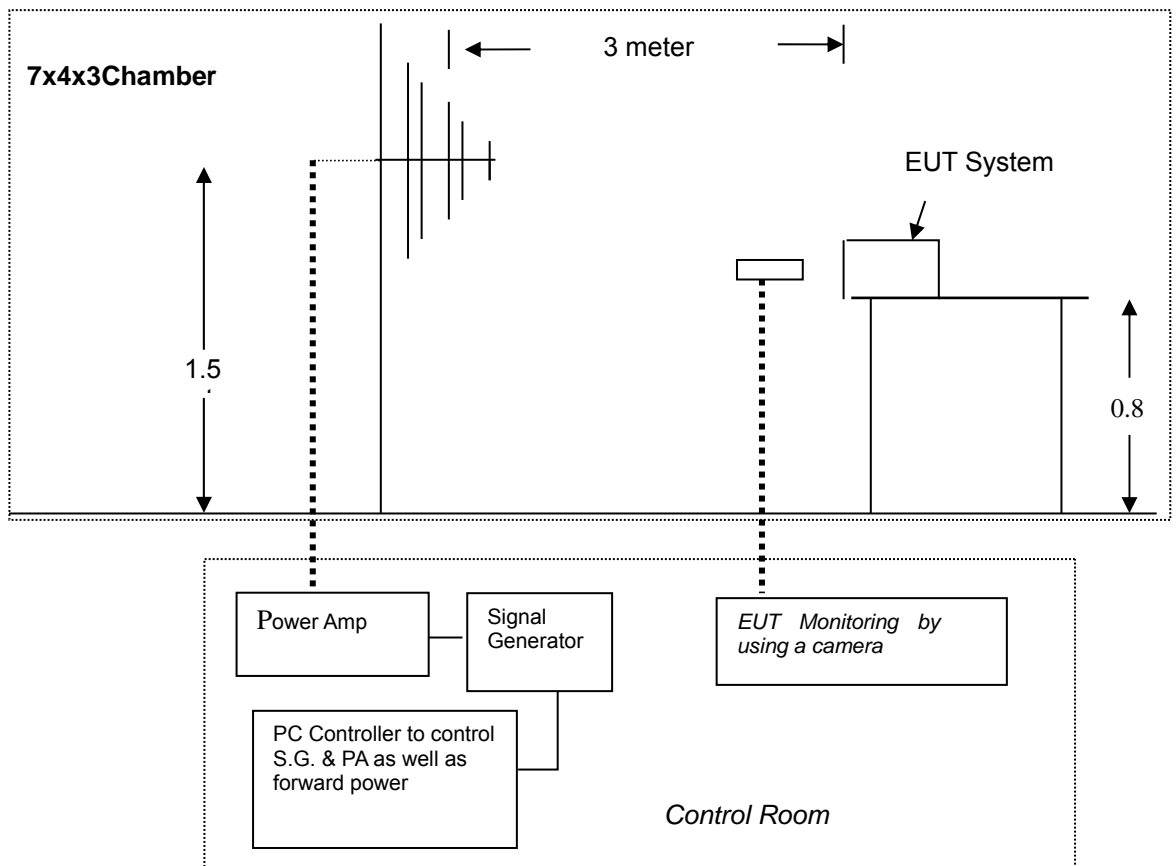
10.1. Block Diagram of Test

10.1.1. Block diagram of connection between the EUT and Load



(EUT: Uninterruptible Power Systems)

10.1.2. Block diagram of RS test setup



(EUT: Uninterruptible Power Systems)

10.2. Test Standard

IEC 61000-4-3:2006+A1:2007+A2:2010 (level 3: 10V / m)

10.3. Severity Levels and Performance Criterion

10.3.1. Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

10.3.2. Performance Criterion : A

	Criterion A
External and internal indications and metering (LCD)	No change
Output characteristics (Load)	No change
Control signals to external devices (Signal line)	No change
Mode of operation	No change

10.4. EUT Configuration on Test

The configuration of the EUT is same as Section 4.3.

10.5. Operating Condition of EUT

Same as radiated emission measurement which is listed in Section 4.4, except the test setup replaced as Section 10.1.

10.6. Test Procedure

The EUT is placed on a table which is 0.8m high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor its screen. All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	10V/m(level 3)
2. Radiated Signal	Modulated
3. Scanning Frequency	80-1000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

10.7. Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

EMTEK (SHENZHEN) CO., LTD.

<p>Applicant : INVT POWER SYSTEM(SHENZHEN) CO., LTD</p> <hr/> <p>EUT : Uninterruptible Power Systems</p> <hr/> <p>M/N : HR33025CL</p> <hr/> <p>Field Strength : 10V/m</p> <hr/> <p>Power Supply : AC 380V/50Hz</p> <hr/> <p>Test Engineer : ZZY</p> <hr/>	<p>Test Date : August 25, 2017</p> <hr/> <p>Temperature : 22°C</p> <hr/> <p>Humidity : 50%</p> <hr/> <p>Actual Criterion : A</p> <hr/> <p>Test Mode : Line mode, Bat mode</p> <hr/> <p>Frequency Range : 80 to 1000 MHz</p> <hr/>		
<p>Modulation: <input type="checkbox"/>None <input type="checkbox"/>Pulse <input checked="" type="checkbox"/>AM 1KHz 80%</p>			
<p>Frequency Rang 1: 80~ 1000MHz</p>			
<p>Frequency Rang 2: N/A</p>			
Steps	# / %	# / %	# / %
	Horizontal	Vertical	Horizontal
Front	A	A	
Right	A	A	
Rear	A	A	
Left	A	A	
<p>Test Equipment :</p> <p>1. Signal Generator : N5181A (Agilent)</p> <p>2. Power Amplifier : 80RF1000-175 (MILMEGA) & AS1860-50 (MILMEGA)</p> <p>3. Log.-Per.Antenna: VULP9118E (SCHWARZBECK)</p> <p>4 RF Power Meter. Dual Channel: 4232A (BOONTON)</p> <p>5 Field Strength Meter: RSS1006A (DARE)</p>			
<p>Note: /</p>			

11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

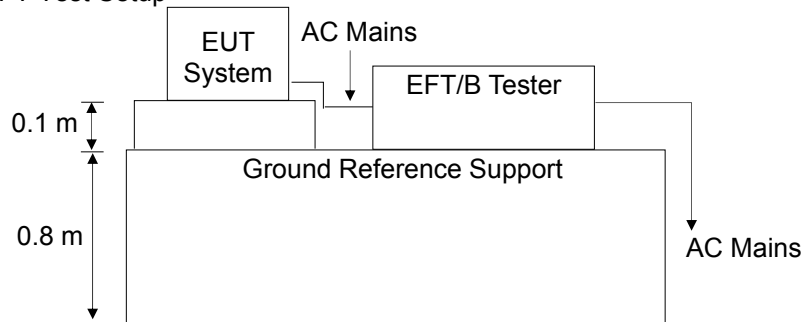
11.1. Block Diagram of Test Setup

11.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power Systems)

11.1.2. EFT Test Setup



(EUT: Uninterruptible Power Systems)

11.2. Test Standard

IEC 61000-4-4:2012 (Level 3: 2KV/5kHz for AC Mains)

11.3. Severity Levels and Performance Criterion

11.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 kV	0.25 kV
2.	1 kV	0.5 kV
3.	2 kV	1 kV
4.	4 kV	2 kV
X	Special	Special

11.3.2. Performance criterion : B

Criterion B	
Output characteristics	Voltage permitted to vary within the inverse time characteristics applicable (< 100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)
External and internal indications and metering	Change only during test
Control signals to external devices	Change only temporarily in consistency with the actual Uninterruptible Power Systems mode of operation
Mode of operation	Change only temporarily

11.4.EUT Configuration

The configuration of EUT is listed in Section 4.4.

11.5.Operating Condition of EUT

11.5.1.Setup the EUT as shown in Section 11.1.

11.5.2.Turn on the power of all equipment.

11.5.3.Let the EUT work in test mode (Line mode) and measure it.

11.6.Test Procedure

The EUT is put on the table which is 0.8m high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

11.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

11.6.2. For signal line and control lines ports:

It's unnecessary to test.

11.6.3. For DC output line ports:

It's unnecessary to test.

11.7.Test Result

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

EMTEK (SHENZHEN) CO., LTD.

Standard	IEC 61000-4-4	Result: <input checked="" type="checkbox"/> PASS / <input type="checkbox"/> FAIL	
Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u> EUT : <u>Uninterruptible Power Systems</u> M/N : <u>HR33025CL</u> Input Voltage : <u>AC 380V/50Hz</u> Actual Criterion : <u>B</u> Ambient Condition : <u>23 °C</u> <u>55% RH</u>			
Operation Mode: Line mode			
Line : <input checked="" type="checkbox"/> AC input and output power ports		Line : <input type="checkbox"/> Signal <input type="checkbox"/> I/O Cable	
Coupling : <input checked="" type="checkbox"/> Direct		Coupling : <input type="checkbox"/> Capacitive	
Test Time : 120s			
Line	Test Voltage	Result(+)	Result(-)
AC input power ports: L1, L2, L3, N, PE	2kV	A	A
L1-L2, L1-L3, L2-L3, L1-N, L2-N, L3-N	2kV	A	A
L1-PE, L2-PE, L3-PE, N-PE	2kV	A	A
L1-L2-PE, L1-L3-PE, L2-L3-PE, L1-L2-L3, L1-L2-N, L1-L3-N, L2-L3-N, L1-N-PE, L2-N-PE, L3-N-PE	2kV	A	A
L1-L2-L3-PE, L1-L2-L3-N, L1-L2-N-PE, L1-L3-N-PE, L2-L3-N-PE	2kV	A	A
AC output power ports: L1, L2, L3, N, PE	2kV	A	A
L1-L2, L1-L3, L2-L3, L1-N, L2-N, L3-N	2kV	A	A
L1-PE, L2-PE, L3-PE, N-PE	2kV	A	A
L1-L2-PE, L1-L3-PE, L2-L3-PE, L1-L2-L3, L1-L2-N, L1-L3-N, L2-L3-N, L1-N-PE, L2-N-PE, L3-N-PE	2kV	A	A
L1-L2-L3-PE, L1-L2-L3-N, L1-L2-N-PE, L1-L3-N-PE, L2-L3-N-PE	2kV	A	A
DC line			
Signal line			
Note:			
Test Equipment		Burst Tester Model : PEFT 4010	

12. SURGE IMMUNITY TEST

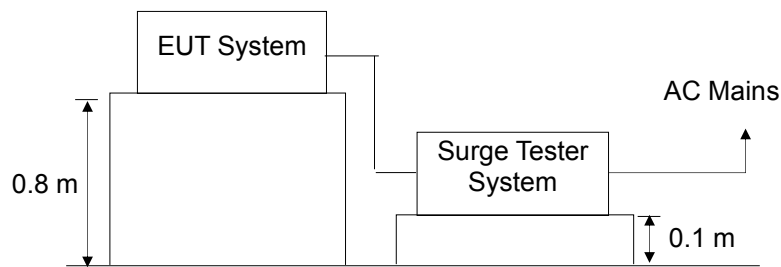
12.1. Block Diagram of Test Setup

12.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power Systems)

12.1.2. Surge Test Setup



(EUT: Uninterruptible Power Systems)

12.2. Test Standard

IEC 61000-4-5:2014 (Line to Line: Level 2, 1.0kV, Line to earth: Level 3, 2.0kV)

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

12.3.2. Performance criterion: B

	Criterion B
Output characteristics	Voltage permitted to vary within the inverse time characteristics applicable (<100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)
External and internal indications and metering	Change only during test
Control signals to external devices	Change only temporarily in consistency with the actual Uninterruptible Power Systems mode of operation
Mode of operation	Change only temporarily

12.4.EUT Configuration

The configuration of EUT is listed in Section 4.3.

12.5.Operating Condition of EUT

12.5.1.Setup the EUT as shown in Section 12.1.

12.5.2.Turn on the power of all equipment.

12.5.3.Let the EUT work in test mode (Line mode) and measure it.

12.6.Test Procedure

- 1) Set up the EUT and test generator as shown on Section 12.1.2.
For line to line coupling mode, provide 1kV 1.2/50us voltage surge.
For line to earth coupling mode, provide 2kV 1.2/50us voltage surge.
(At open-circuit condition) and 8/20us current surge to EUT selected points.
- 2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 3) Different phase angles are done individually.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

12.7.Test Result

PASS.

Please refer to the following page.

Surge Immunity Test Result

EMTEK (SHENZHEN) CO., LTD.

Applicant : INVT POWER SYSTEM(SHENZHEN) CO., LTD

Test Engineer: ZZY

EUT : Uninterruptible Power Systems

Test Date : August 25, 2017

M/N : HR33025CL

Temperature : 23°C

Power Supply : AC 230V / 50Hz

Humidity : 51%

Test Mode : Line mode

Criterion : B

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
AC Input: L1-L2, L1-L3, L2-L3	+	0°, 90°, 180°, 270°	5	1.0	A
	-	0°, 90°, 180°, 270°	5	1.0	A
L1-N, L2-N, L3-N	+	0°, 90°, 180°, 270°	5	1.0	A
	-	0°, 90°, 180°, 270°	5	1.0	A
L1-PE, L2-PE, L3-PE	+	0°, 90°, 180°, 270°	5	2.0	A
	-	0°, 90°, 180°, 270°	5	2.0	A
N-PE	+	0°, 90°, 180°, 270°	5	2.0	A
	-	0°, 90°, 180°, 270°	5	2.0	A
AC Output: L1-L2, L1-L3, L2-L3	+	Random	5	1.0	A
	-	Random	5	1.0	A
L1-N, L2-N, L3-N	+	Random	5	1.0	A
	-	Random	5	1.0	A
L1-PE, L2-PE, L3-PE	+	Random	5	2.0	A
	-	Random	5	2.0	A
N-PE	+	Random	5	2.0	A
	-	Random	5	2.0	A

Note:

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

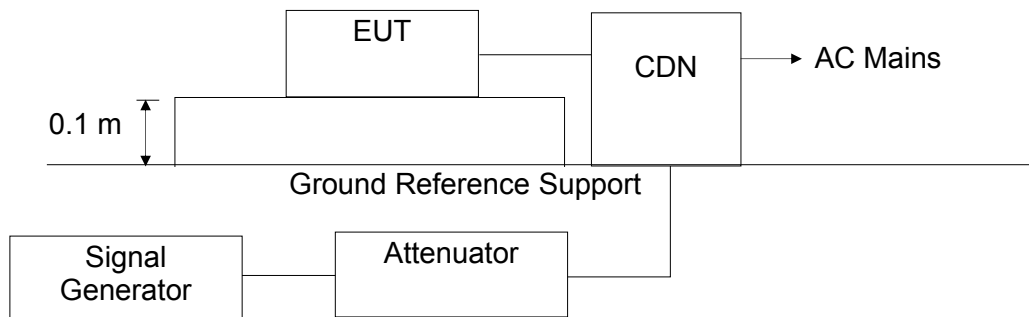
13.1. Block Diagram of Test Setup

13.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power Systems)

13.1.2. Block Diagram of Test Setup



13.2. Test Standard

IEC 61000-4-6:2013 (Level 3: 10V (rms) (0.15MHz ~ 80MHz))

13.3. Severity Levels and Performance Criterion

13.3.1. Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

13.3.2. Performance criterion: A

	Criterion A
External and internal indications and metering (LCD)	No change
Output characteristics (Load)	No change
Control signals to external devices (Signal line)	No change
Mode of operation	No change

13.4.EUT Configuration

The configuration of EUT is listed in Section 4.3.

13.5.Operating Condition of EUT

13.5.1.Setup the EUT as shown in Section 13.1.

13.5.2.Turn on the power of all equipment.

13.5.3.Let the EUT work in test mode (Line mode) and measure it.

13.6.Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 13.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to80MHz using 10V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed $1.5 \cdot 10^{-3}$ decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

13.7.Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results

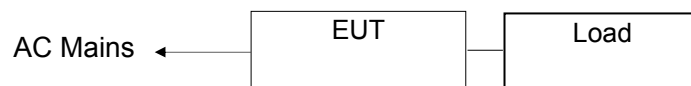
EMTEK (SHENZHEN) CO., LTD.

Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u>		Test Date : <u>August 25, 2017</u>		
EUT : <u>Uninterruptible Power Systems</u>		Temperature : <u>23°C</u>		
M/N : <u>HR33025CL</u>		Humidity : <u>50%</u>		
Power Supply : <u>AC 380V/50Hz</u>		Actual Criterion : <u>A</u>		
Test Engineer : <u>ZZY</u>				
Test Mode : Line mode				
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Input	10V	A	A
0.15 ~ 80	AC Output	10V	A	A
Remark : 1. Modulation Signal:1KHz 80% AM Measurement Equipment : Simulator: CWS 500C (SWITZERLAND EMTEST) CDN : <input type="checkbox"/> CDN-M2 (SWITZERLAND EMTEST) <input checked="" type="checkbox"/> CDN-M4 (SWITZERLAND EMTEST) <input type="checkbox"/> EM-Clamp (SWITZERLAND EMTEST)		Note: /		

14. MAGNETIC FIELD SUSCEPTIBILITY TEST

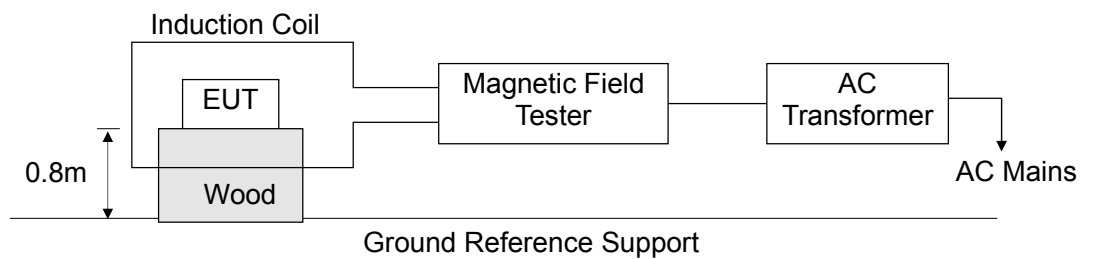
14.1. Block Diagram of Test

14.1.1. Block diagram of test setup



(EUT: Uninterruptible Power Systems)

14.1.2. Magnetic field test setup



(EUT: Uninterruptible Power Systems)

14.2. Test Standard

IEC 61000-4-8:2009, (Severity Level 4: 30A / m)

14.3. Severity Levels and Performance Criterion

14.3.1. Severity Levels

Level	Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

14.3.2.Performance Criterion: A

	Criterion A
Output characteristics	Voltage permitted to vary within the inverse time characteristics applicable (<100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)
External and internal indications and metering	Change only during test
Control signals to external devices	Change only temporarily in consistency with the actual Uninterruptible Power Systems mode of operation
Mode of operation	Change only temporarily

14.4.EUT Configuration on Test

The configuration of the EUT is same as Section 4.3.

14.5.Test Procedure

The EUT is placed in the middle of a induction coil, under which is a 0.8m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

14.6.Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Result

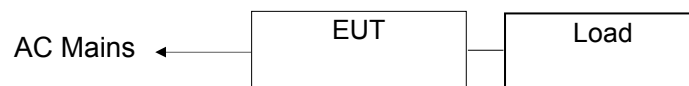
EMTEK (SHENZHEN) CO., LTD.

Standard	IEC 61000-4-8		Result: <input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail	
Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u> EUT : <u>Uninterruptible Power Systems</u> M/N : <u>HR33025CL</u> Input Voltage : <u>AC 380V/50Hz</u> Date of Test : <u>August 25, 2017</u> Test Engineer : <u>ZZY</u> Ambient Condition : Temp : <u>22°C</u> Humid : <u>50%</u> Actual Criterion : A				
Operation Mode : Line mode				
Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
30	5 mins	X	A	A
30	5 mins	Y	A	A
30	5 mins	Z	A	A
Operation Mode : N/A				
Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
Test Equipment	Magnetic Field Test : HEAFELY MAG 100.1			
Note: /				

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

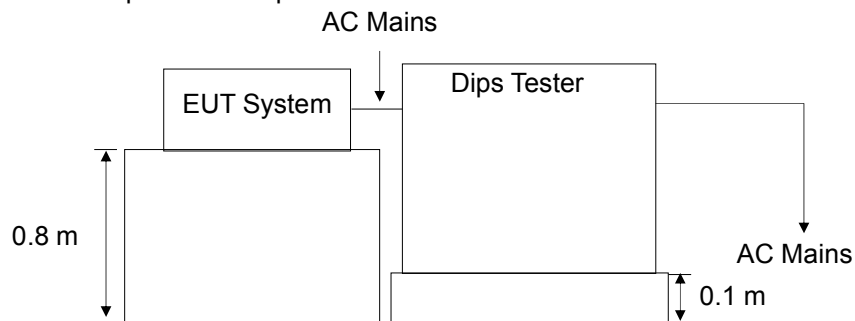
15.1. Block Diagram of Test Setup

15.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power Systems)

15.1.2. Dips Test Setup



(EUT: Uninterruptible Power Systems)

15.2. Test Standard

IEC 61000-4-11:2004

15.3. Severity Levels and Performance Criterion

15.3.1. Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5 1 5 10 25 50 *
40	60	
70	30	

15.3.2.Performance criterion: B

	Criterion B
Output characteristics	Voltage permitted to vary within the inverse time characteristics applicable (<100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)
External and internal indications and metering	Change only during test
Control signals to external devices	Change only temporarily in consistency with the actual Uninterruptible Power Systems mode of operation
Mode of operation	Change only temporarily

15.4.EUT Configuration

The configuration of EUT is listed in Section 4.3.

15.5.Operating Condition of EUT

15.5.1.Setup the EUT as shown in Section 15.1.

15.5.2.Turn on the power of all equipment.

15.5.3.Let the EUT work in test mode (Line mode) and measure it.

15.6.Test Procedure

- 1) Set up the EUT and test generator as shown on Section 15.1.2.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

15.7.Test Result

PASS.

Please refer to the following page.

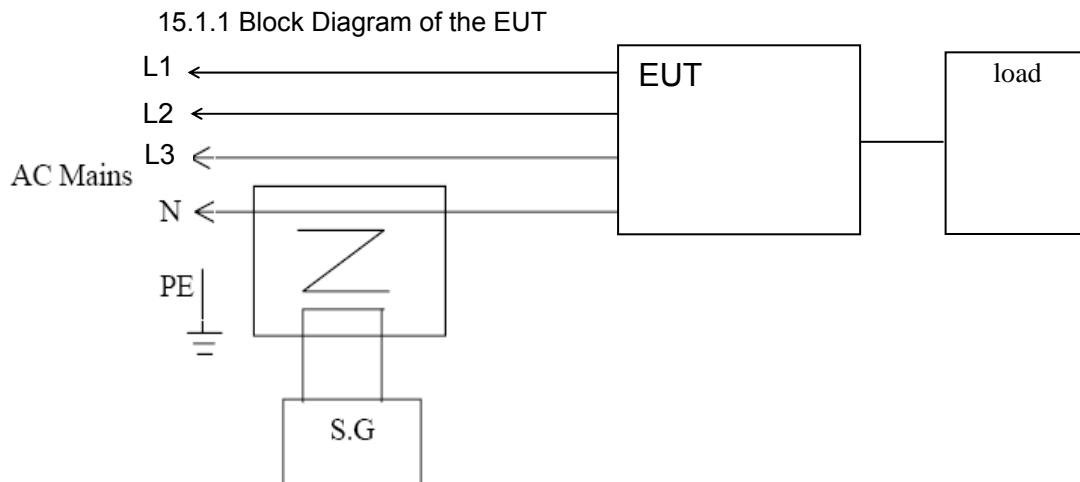
Voltage Dips And Interruptions Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u>		Test Date : <u>August 25, 2017</u>		
EUT : <u>Uninterruptible Power Systems</u>		Temperature : <u>22°C</u>		
M/N : <u>HR33025CL</u>		Humidity : <u>50%</u>		
Power Supply : <u>AC 380V/50Hz</u>		Test Engineer : <u>ZZY</u>		
Test Mode: Line mode				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	Result
0	100	0.5P	B	A
0	100	1P	B	A
70	30	25P	B	A
0	100	250P	B	B
Note: Test in 0%, 250P, light appears flicker, but can self-recovery.				

16. LOW FREQUENCY SIGNALS TEST

16.1. Block Diagram of Test Setup



(EUT: Uninterruptible Power Systems)
Note: Above test setup is worst case by pretest.

16.2. Test Standard

IEC 61000-2-2:2002, Performance: A

	Criterion A
External and internal indications and metering (LCD)	No change
Output characteristics (Load)	No change
Control signals to external devices (Signal line)	No change
Mode of operation	No change

16.3. Operating Condition of EUT

Same as Section 4.4, Except the test setup replaced by Section 16.1.

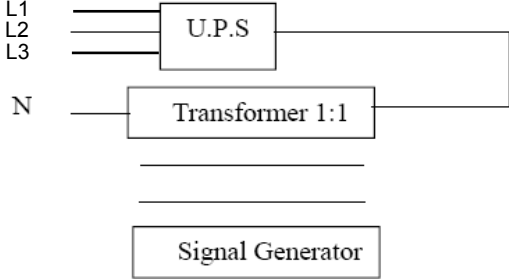
16.4. Test Results

PASS.

Please refer to following page.

Low Frequency Signals Test Result

EMTEK (SHENZHEN) CO., LTD.

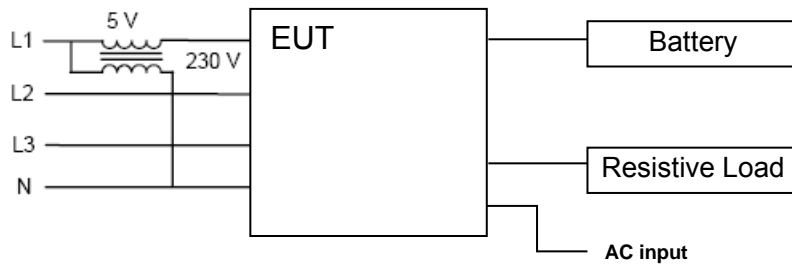
Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u> EUT : <u>Uninterruptible Power Systems</u> M/N : <u>HR33025CL</u> Power Supply : <u>AC 380V/50Hz</u> Test Engineer : <u>ZZY</u>			Test Date : <u>August 25, 2017</u> Temperature : <u>22°C</u> Humidity : <u>58%</u> Test Mode : <u>Line mode</u> Actual Criterion : <u>A</u>	
Frequency Range (Hz)	Position	Strength	Result	Note
140	See Fig.1	10V(rms) Sinusoidal	A	/
160			A	/
200			A	/
240			A	/
280			A	/
320			A	/
360			A	/
Note 			Test Equipment: 1. Isolation transformer Primary: Secondary=1:1 2. Signal Generator AC Source: 6530(Chroma)	

17. POWER LINE UNBALANCE (THREE-PHASE UPS SYSTEMS ONLY)

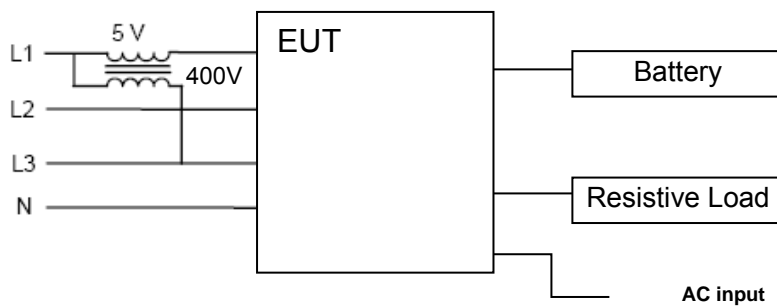
17.1. Block Diagram of Test Setup

17.1.1. Block Diagram of the EUT

For Amplitude unbalance:



For Phase unbalance:



(EUT: Uninterruptible Power Systems)

17.2. Test Standard

EN62040-2: 2006
Performance: A

17.3. Operating Condition of EUT

Same as Section 4.4, Except the test setup replaced by Section 14.1.

17.4. Test Results

PASS.

Please refer to following page.

Power Line Unbalance Test Result

EMTEK (SHENZHEN) CO., LTD.

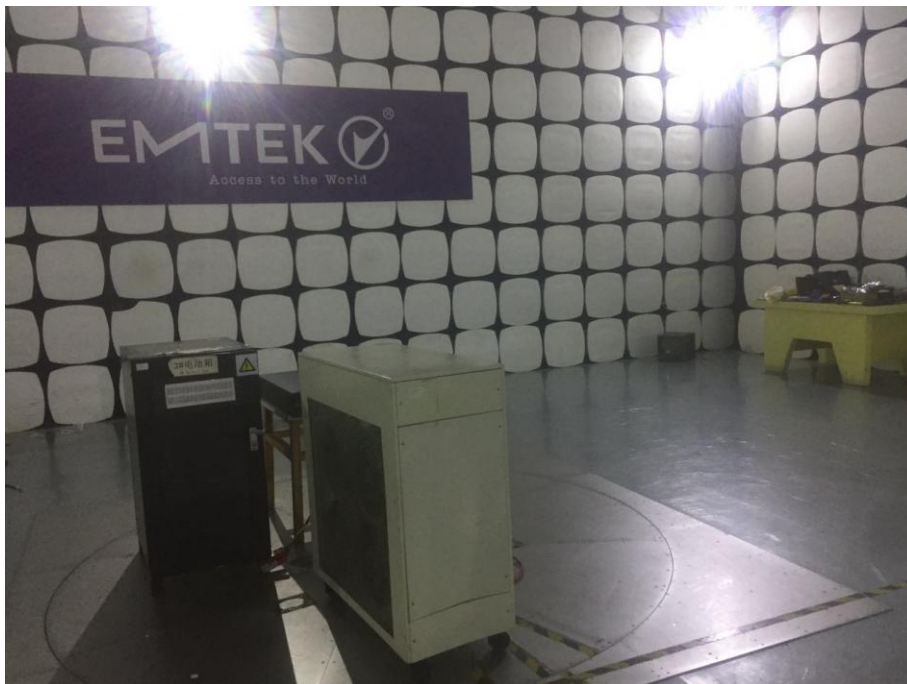
Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u> EUT : <u>Uninterruptible Power Systems</u> M/N : <u>HR33025CL</u> Power Supply : <u>AC 380V/50Hz</u> Test Engineer : <u>ZZY</u>			Test Date: <u>August 25, 2017</u> Temperature : <u>22°C</u> Humidity : <u>50%</u> Test Mode : <u>Line Mode</u> Actual Criterion : <u>A</u>	
Frequency Range (Hz)	Position	Strength	Result	Note
50	See 14.1.1	5V(rms) Sinusoidal	A	N/A
Note: This result for normal. See 14.1.1			Test Equipment: 3. Isolation transformer Primary: Secondary=1:1 4. Signal Generator AC Source: 65930 (Chroma)	

18. TEST PHOTOGRAPHS

18.1. Photos of Conducted Emission Measurement



18.2.Photos of Radiation Emission Measurement



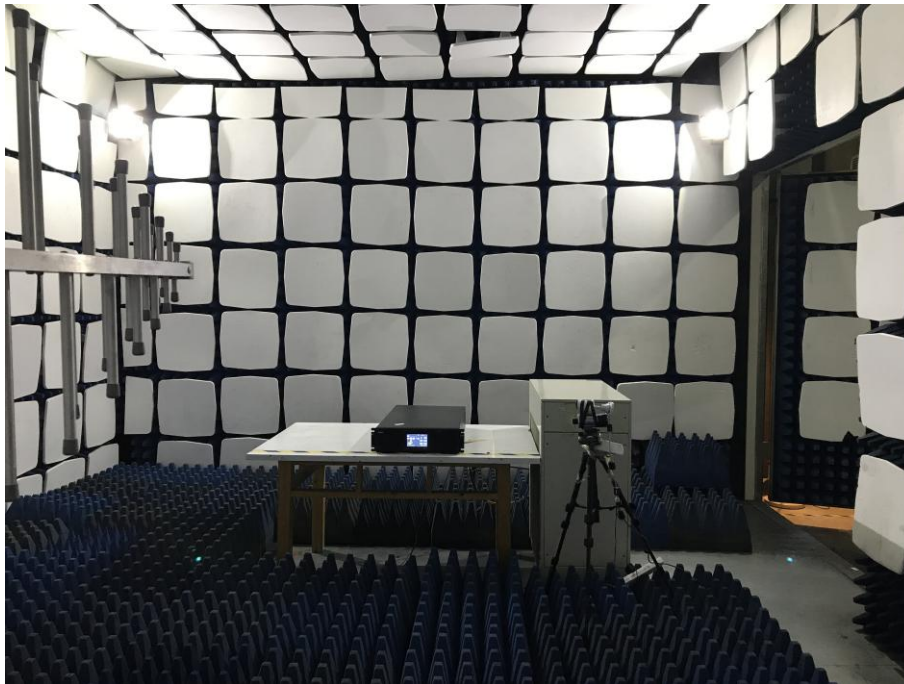
18.3.Photo of Harmonic / Flicker Measurement



18.4.Photo of Electrostatic Discharge Test



18.5. Photo of RF Field Strength susceptibility Test



18.6. Photos of Electrical Fast Transient/Burst Test



18.7.Photo of Surge Test



18.8.Photo of Injected Currents Susceptibility Test



18.9. Photo of Magnetic Field Immunity Test



18.10. Photo of Voltage dips and interruption Test

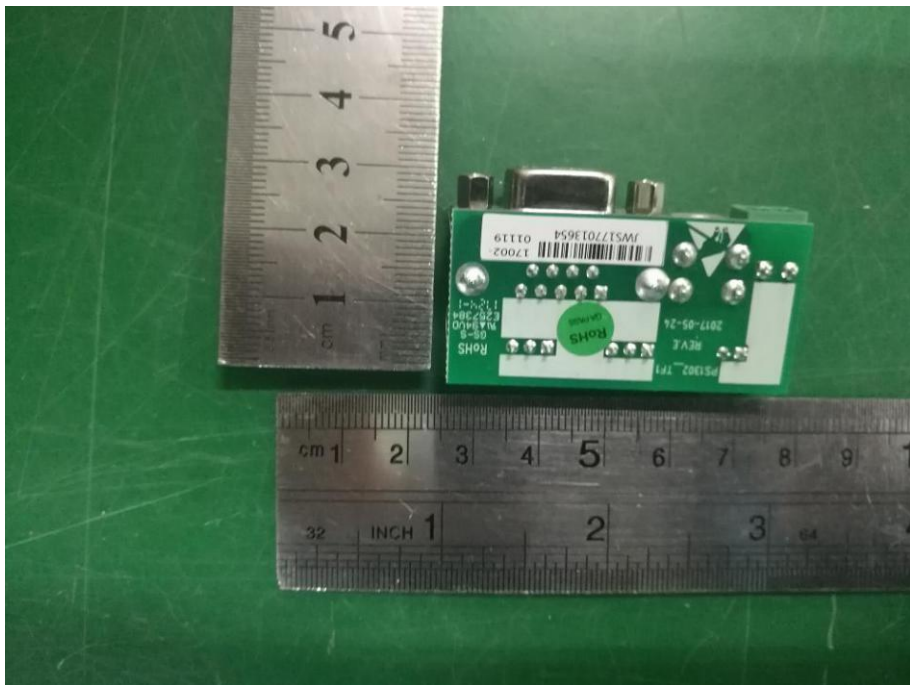


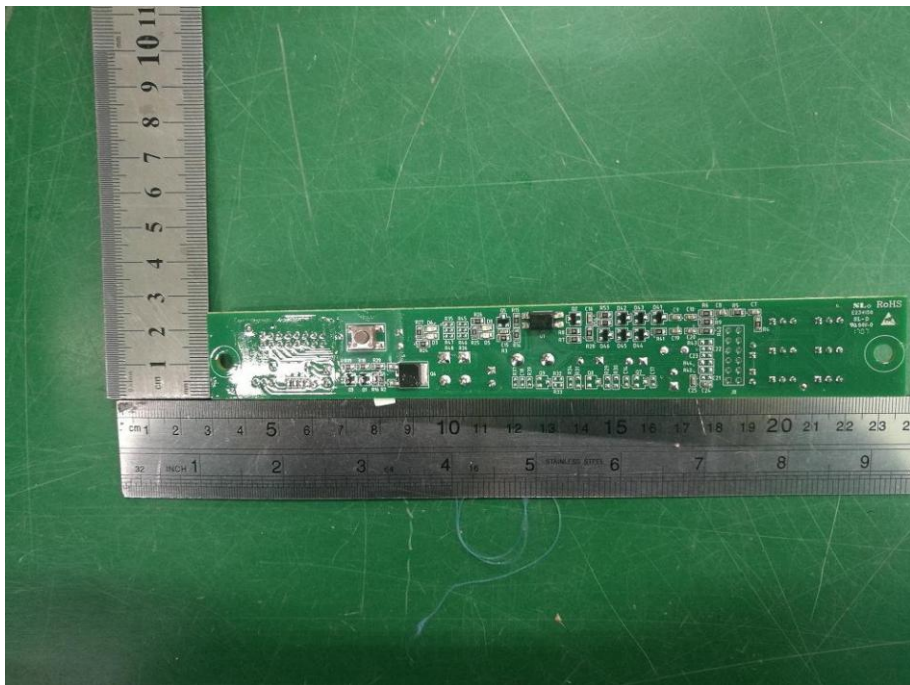
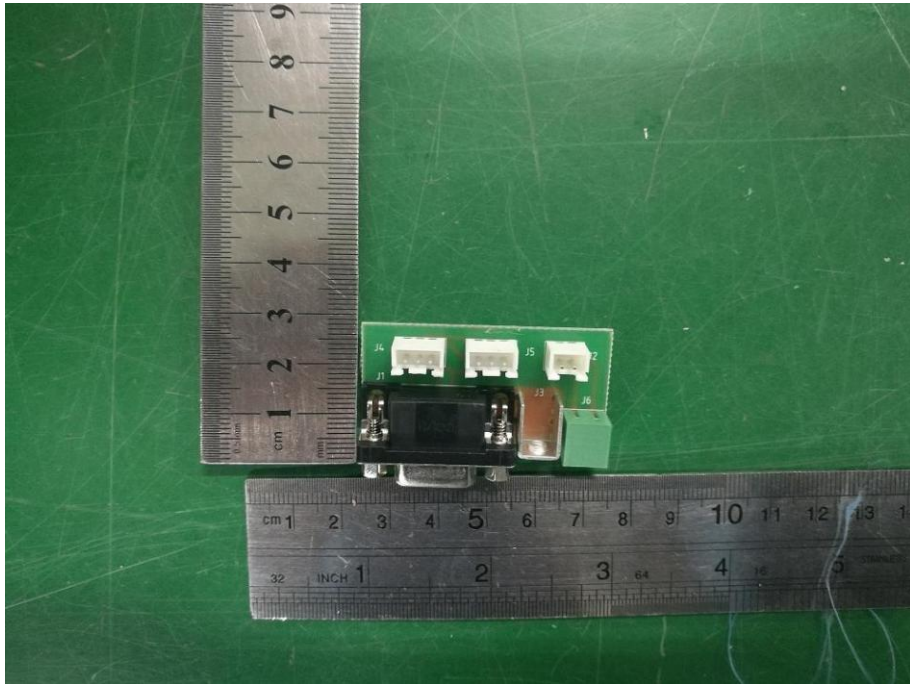
18.11.Photo of Low Frequency Signals and Power Line Unbalance Test

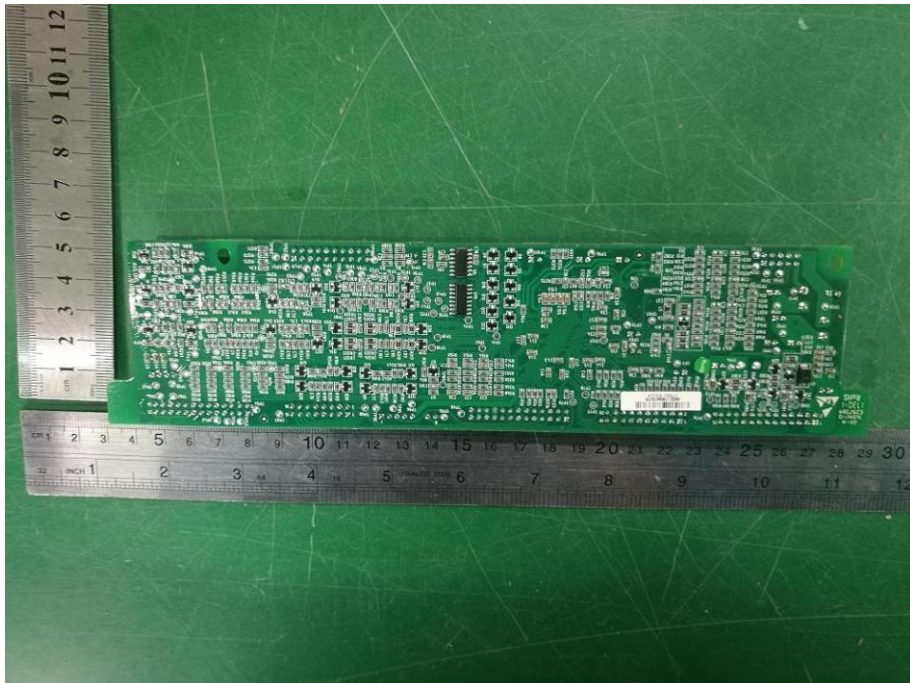
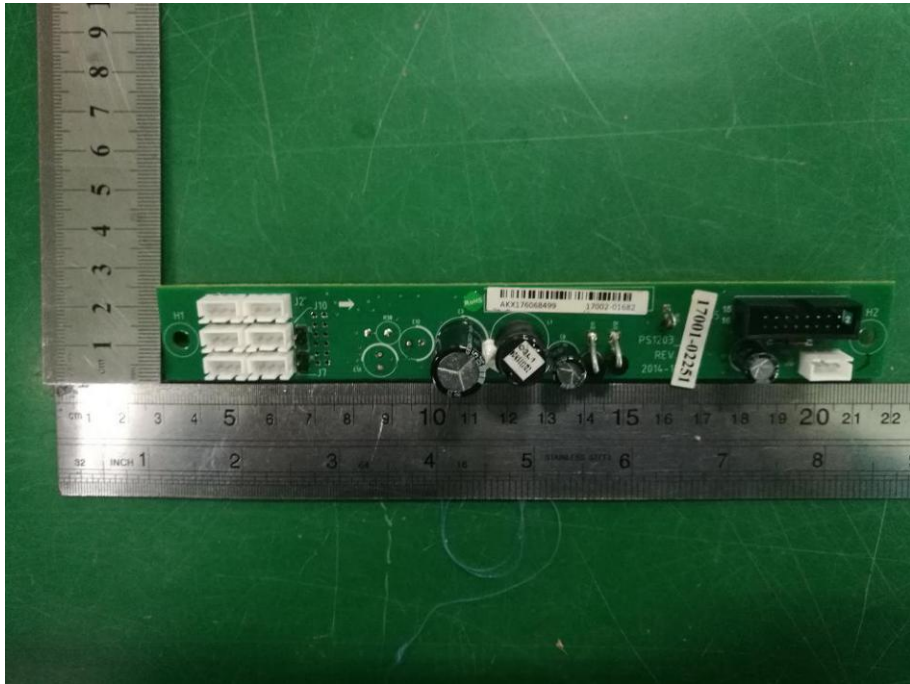


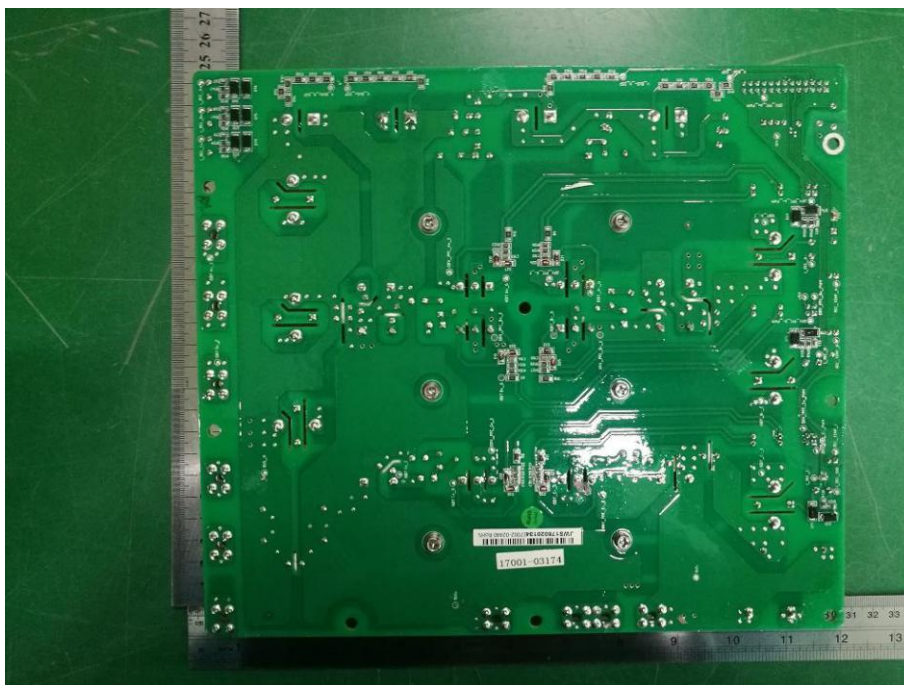
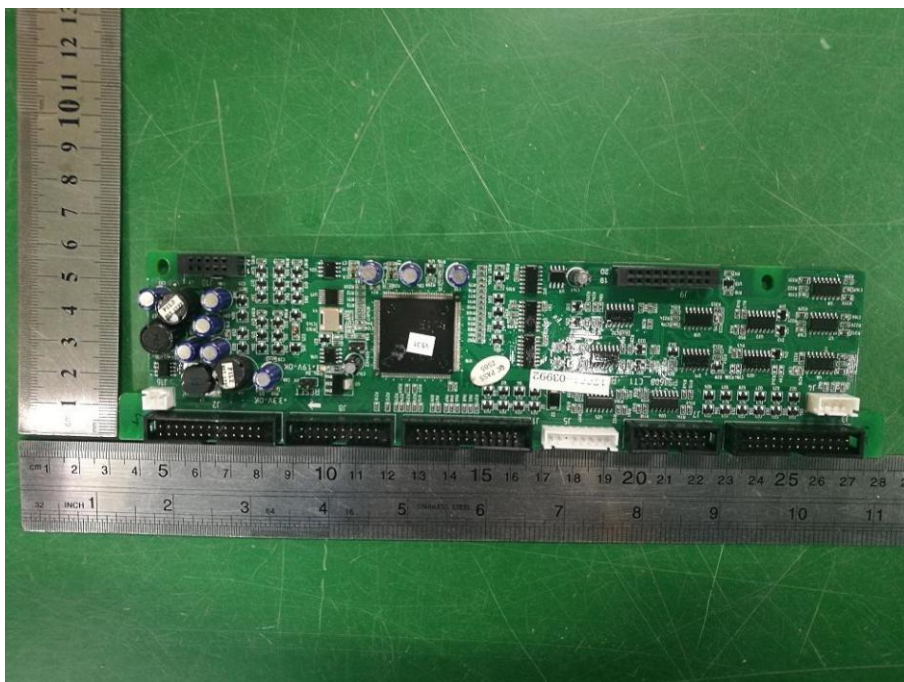
APPENDIX (Photos of EUT)

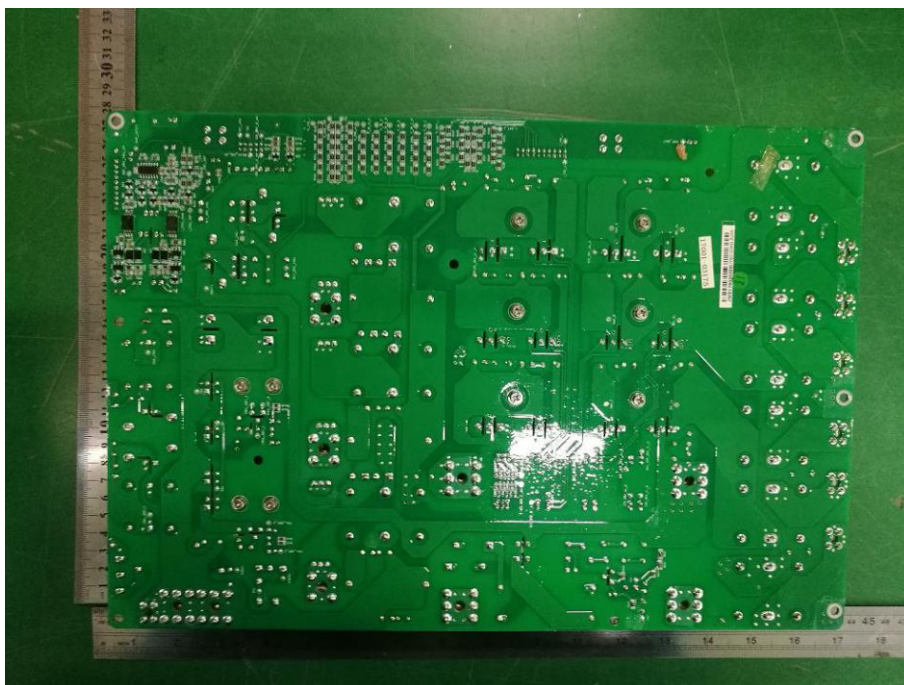
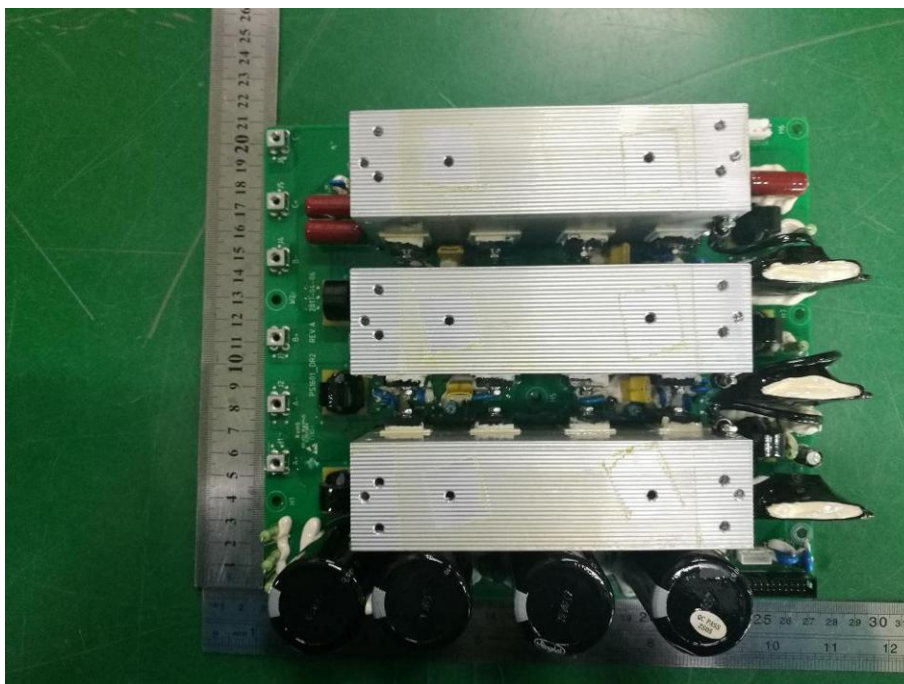


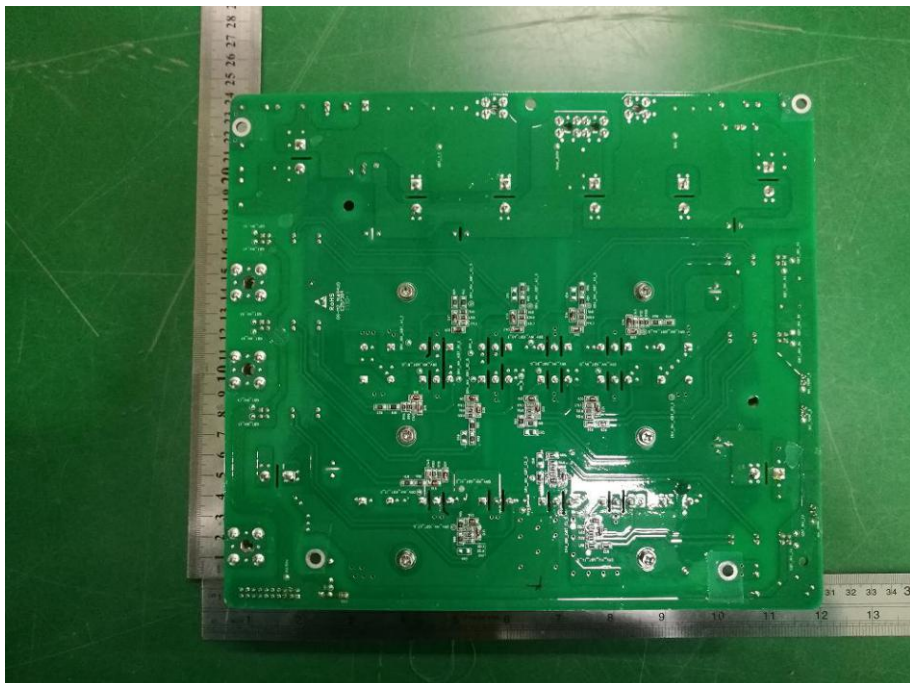
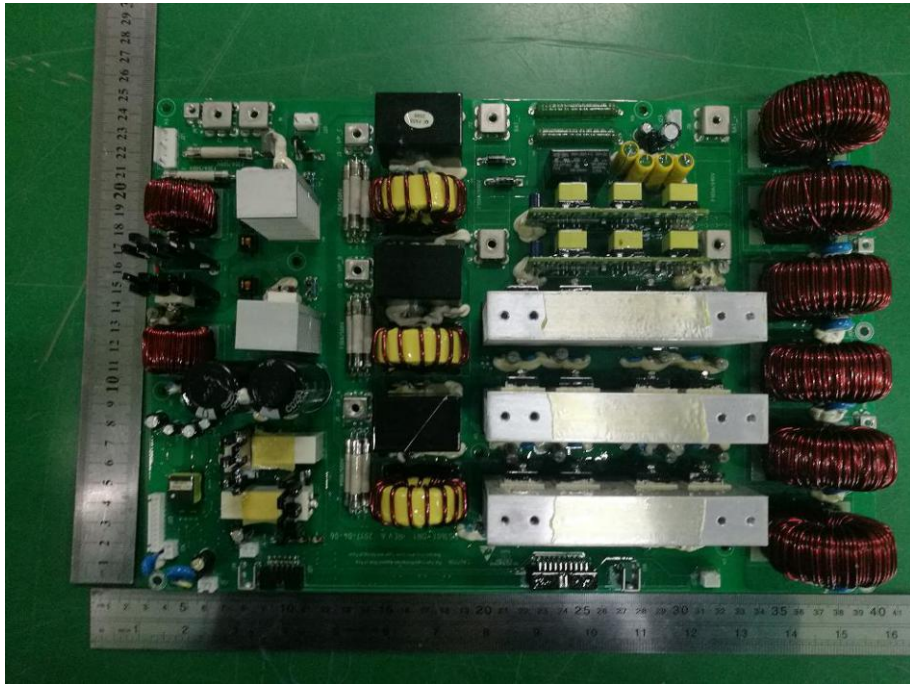


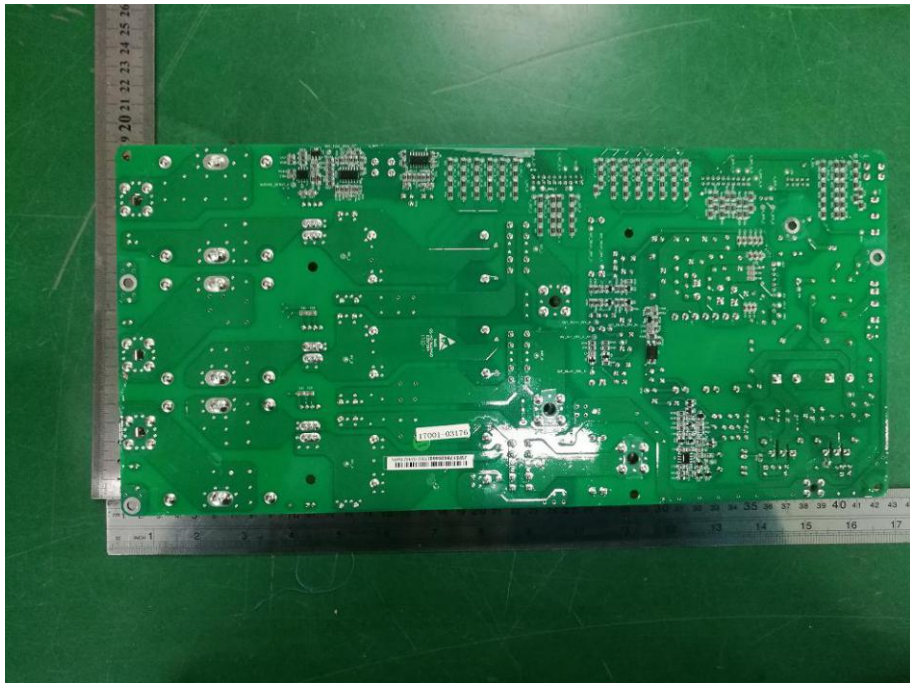
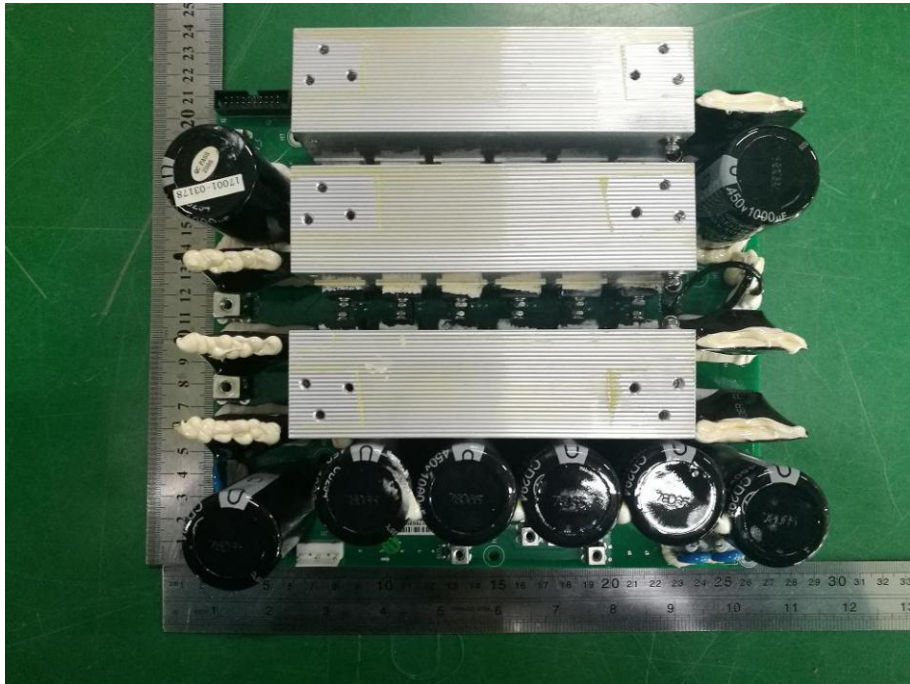


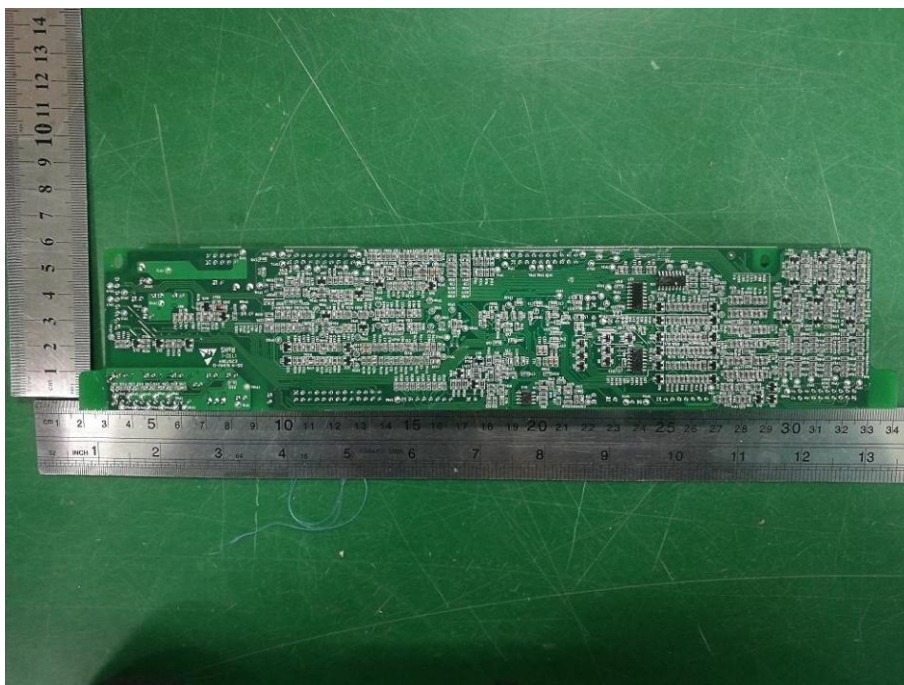
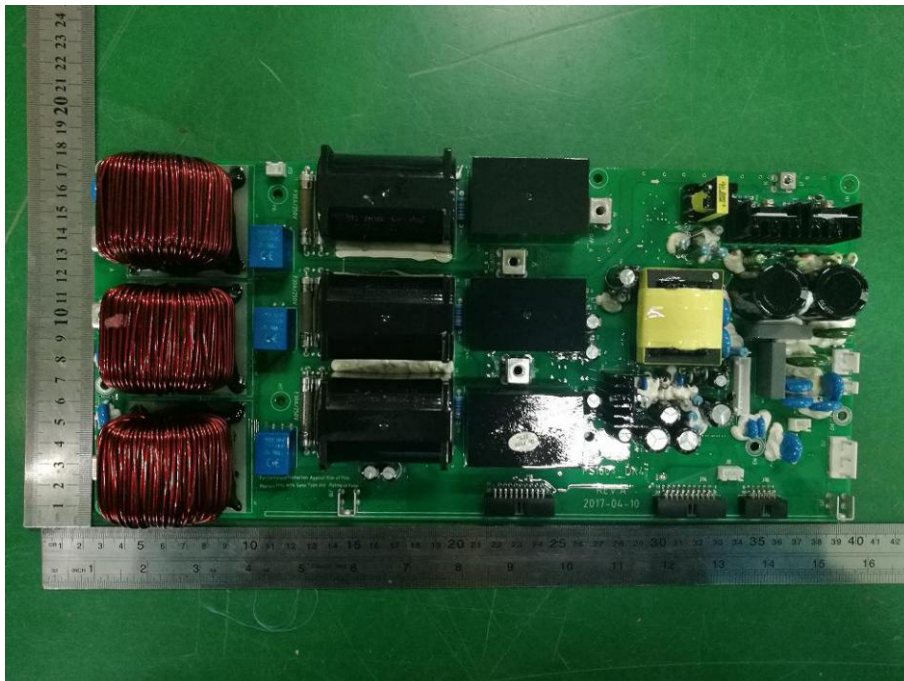


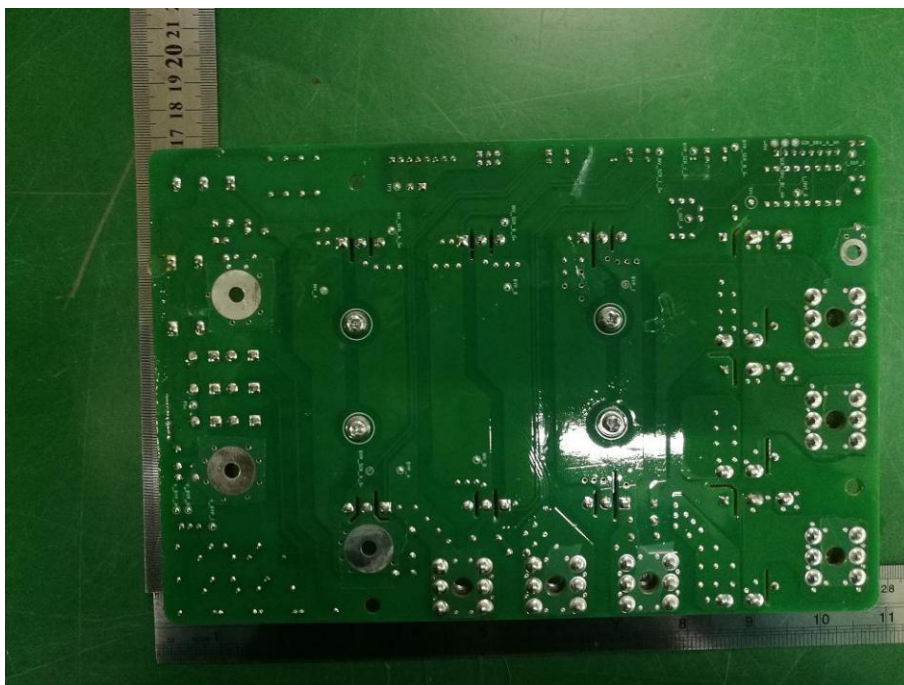
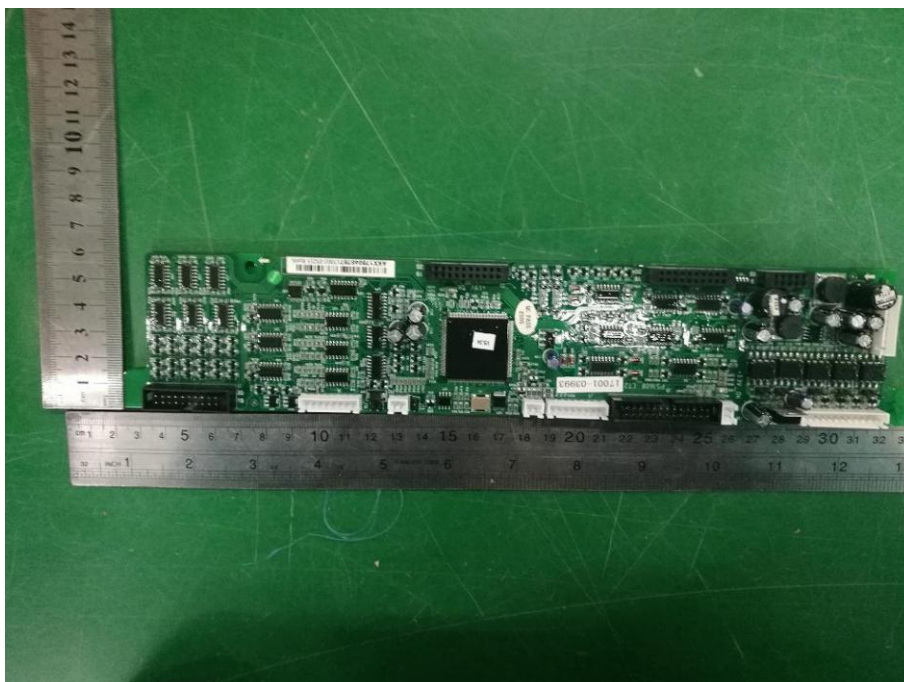


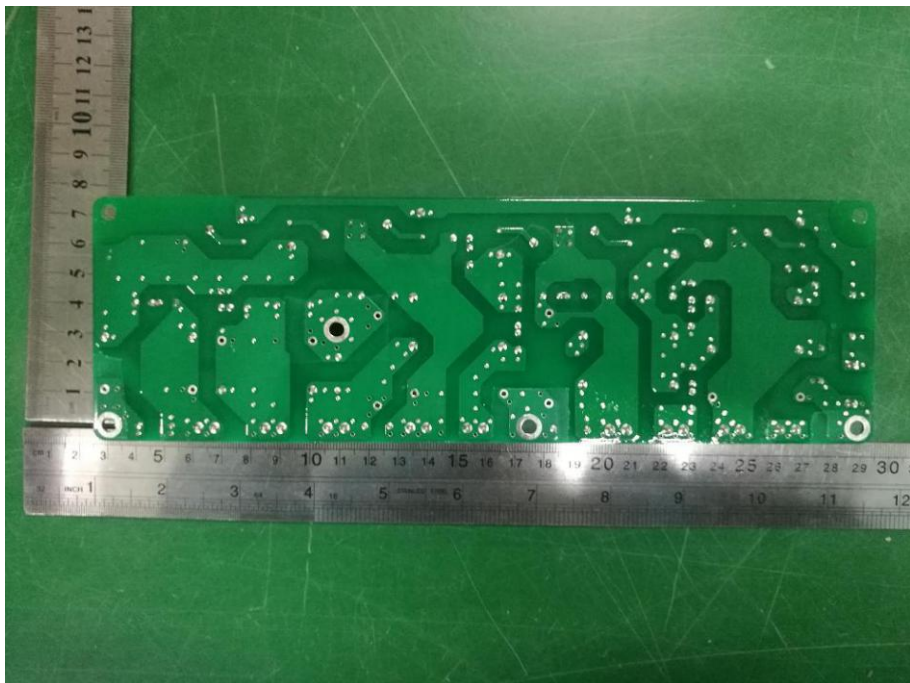
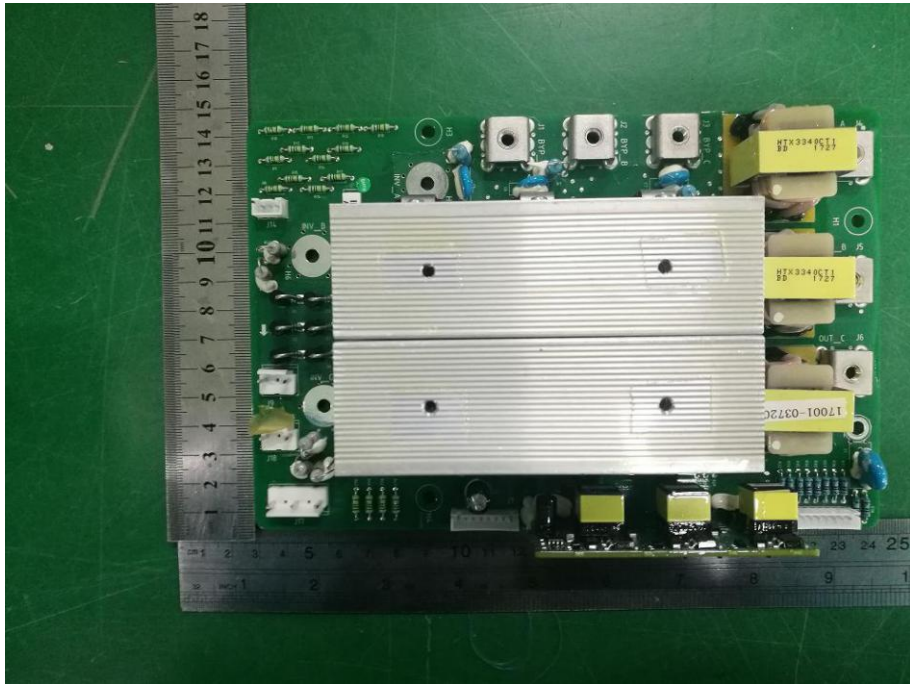


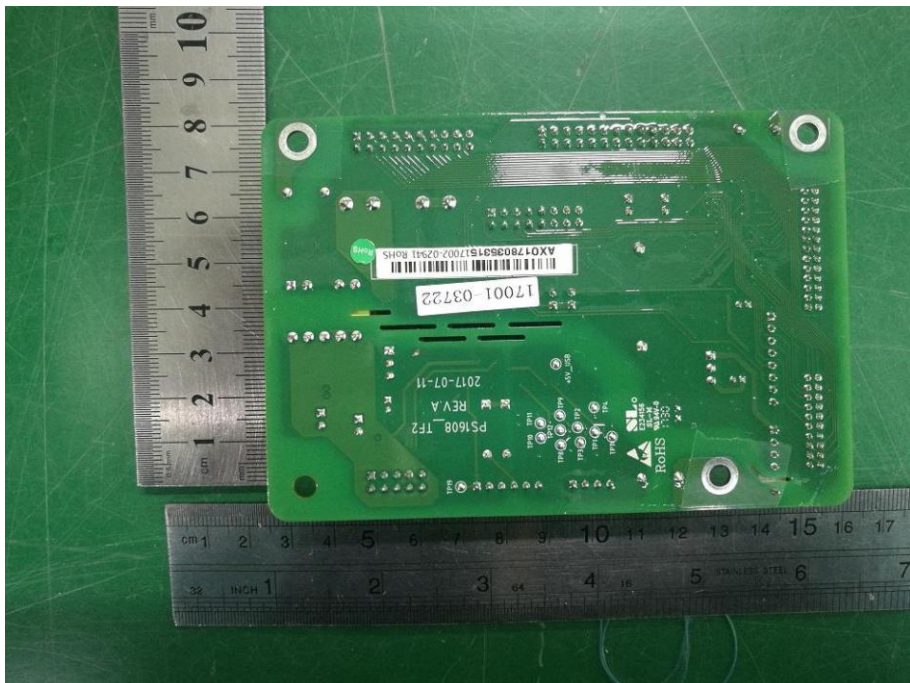
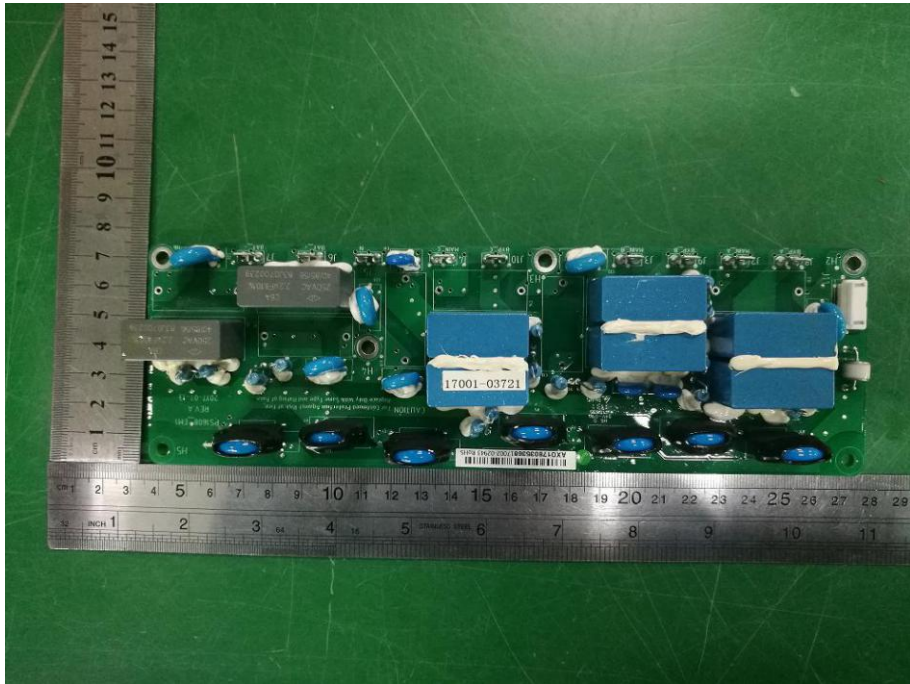


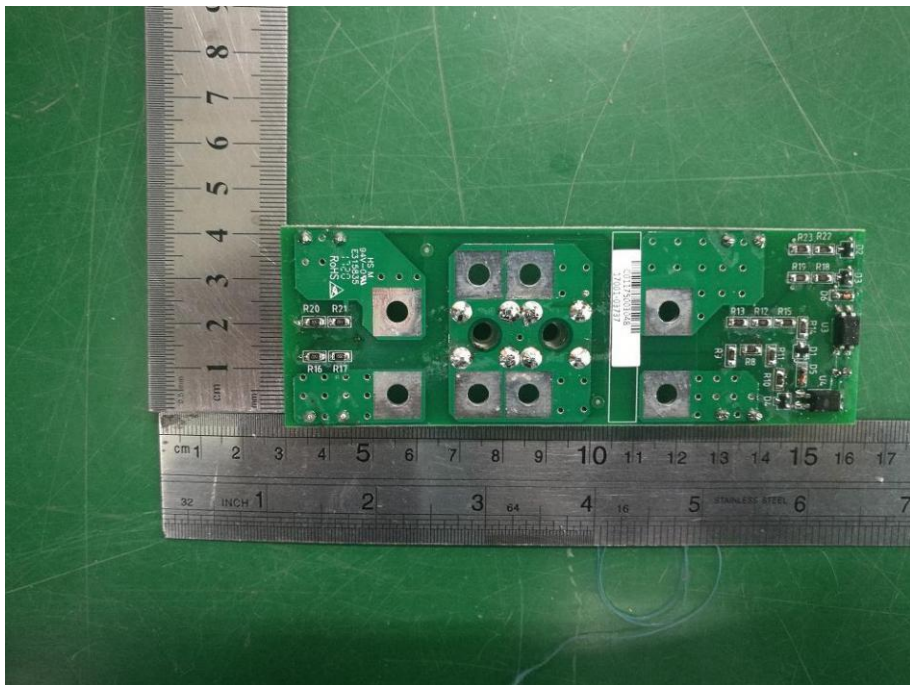
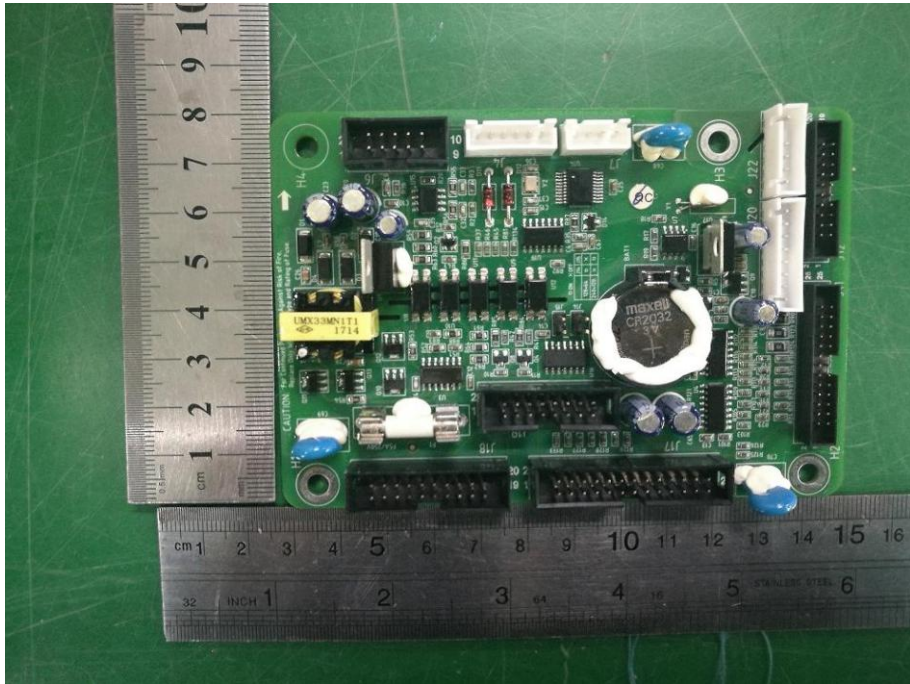


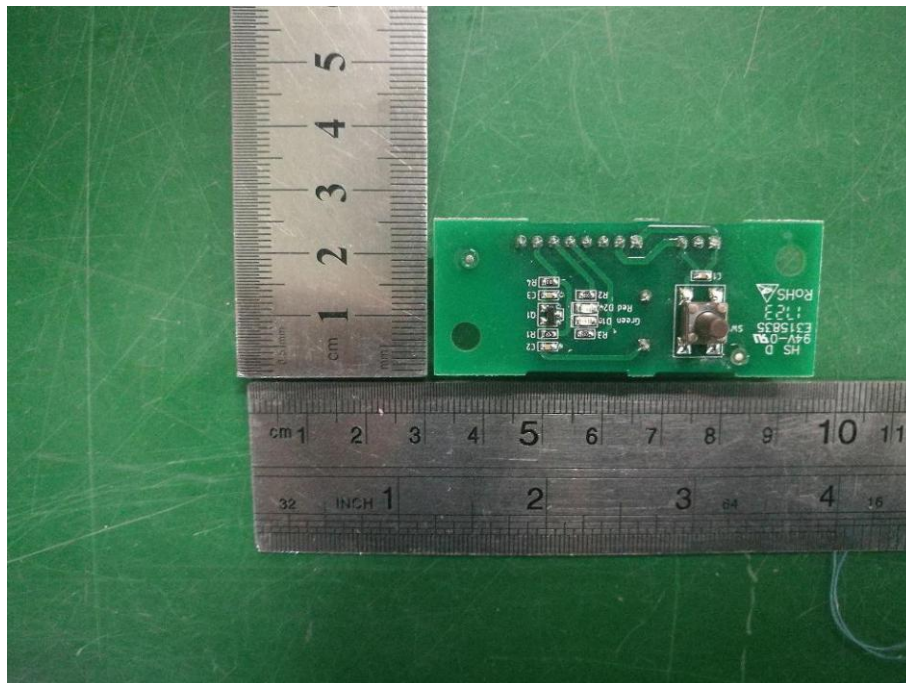
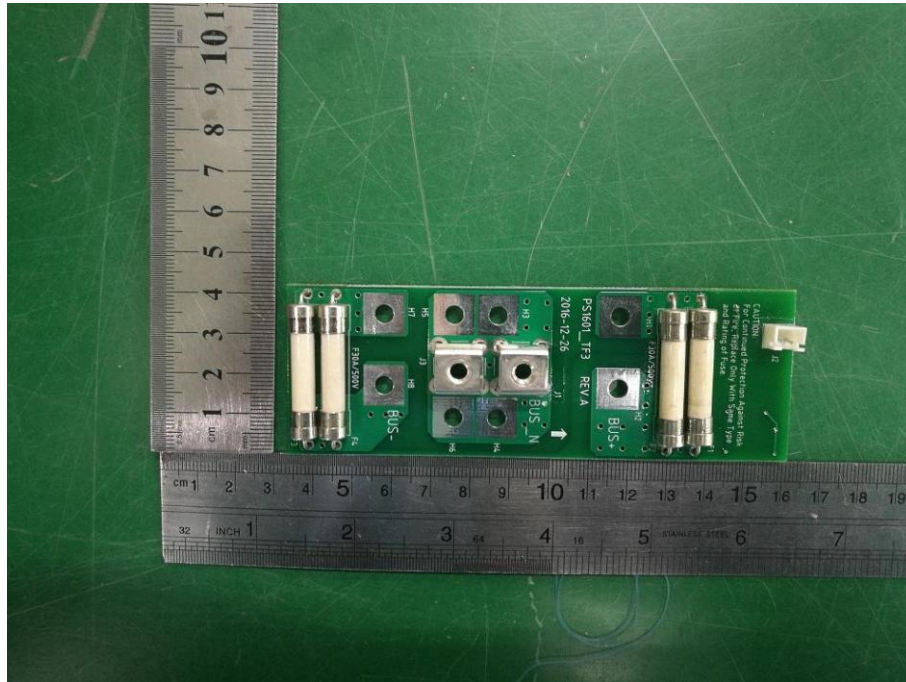


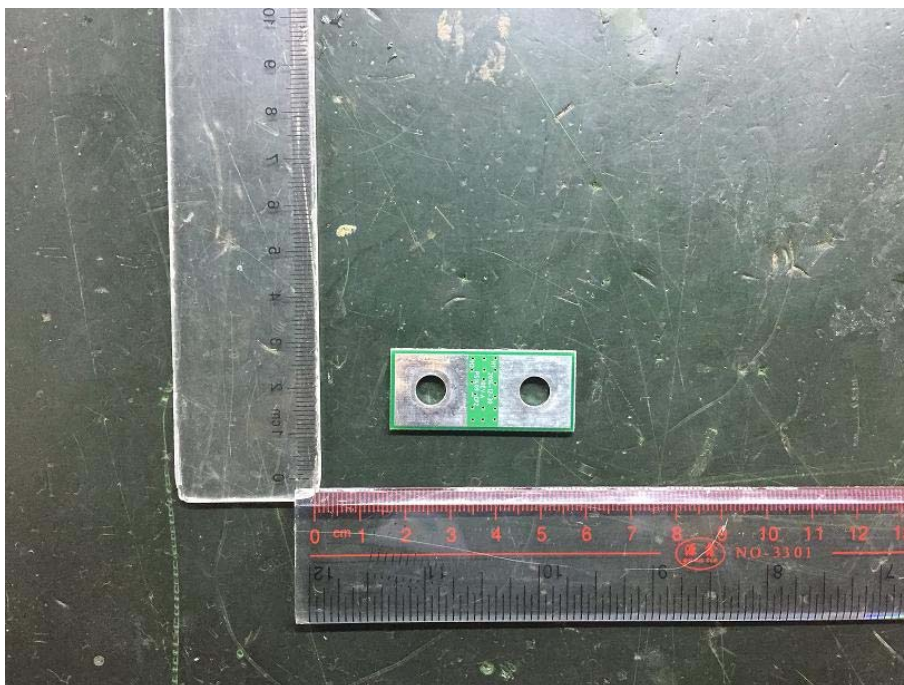


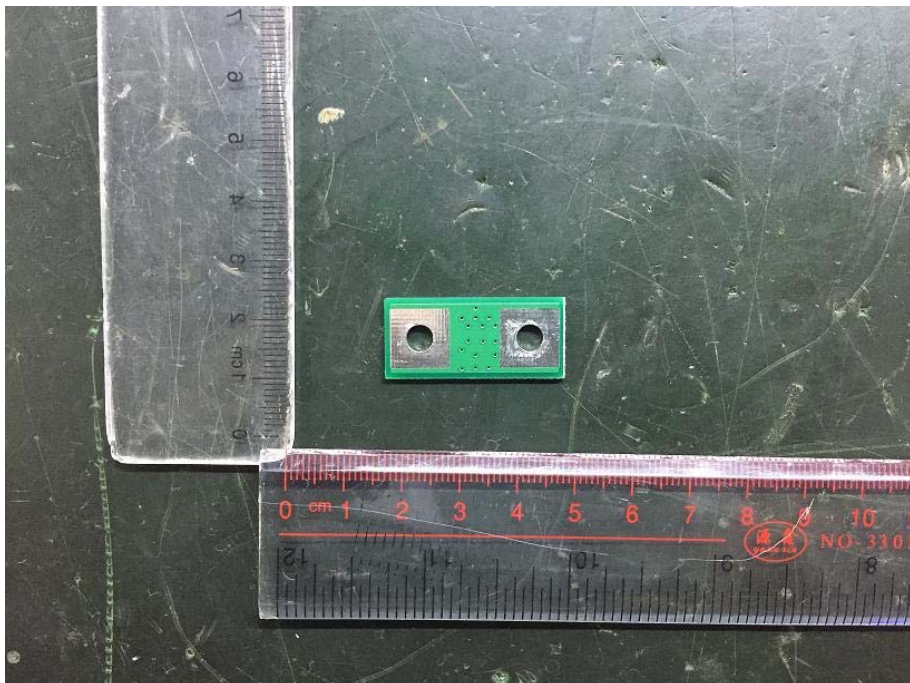


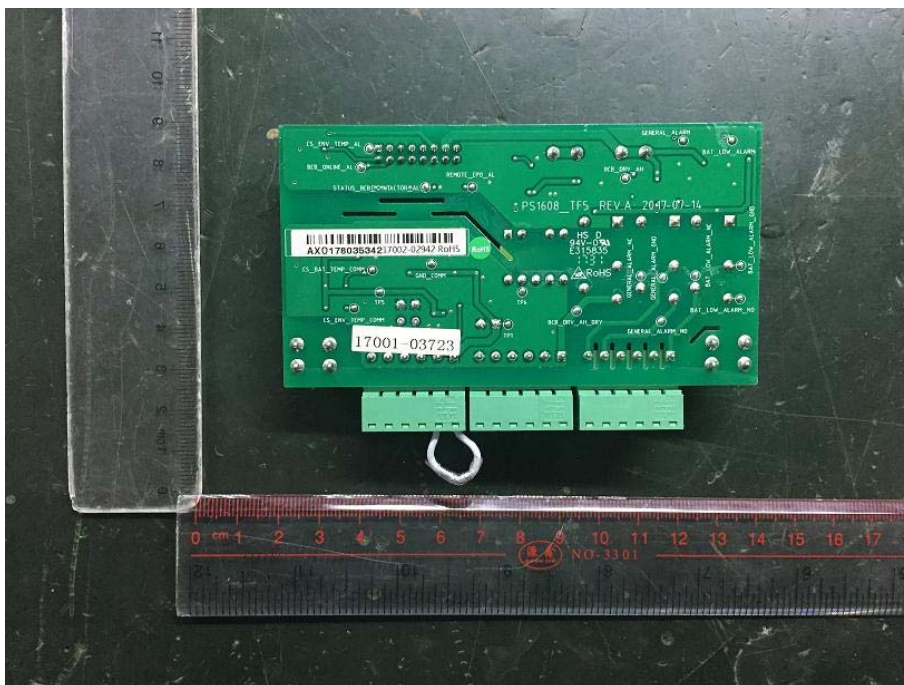
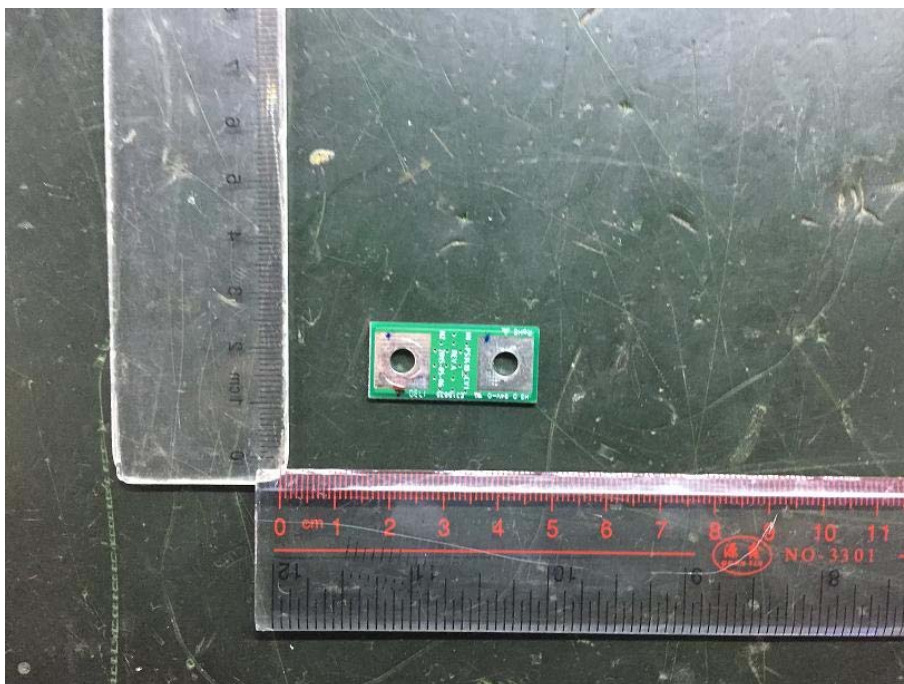


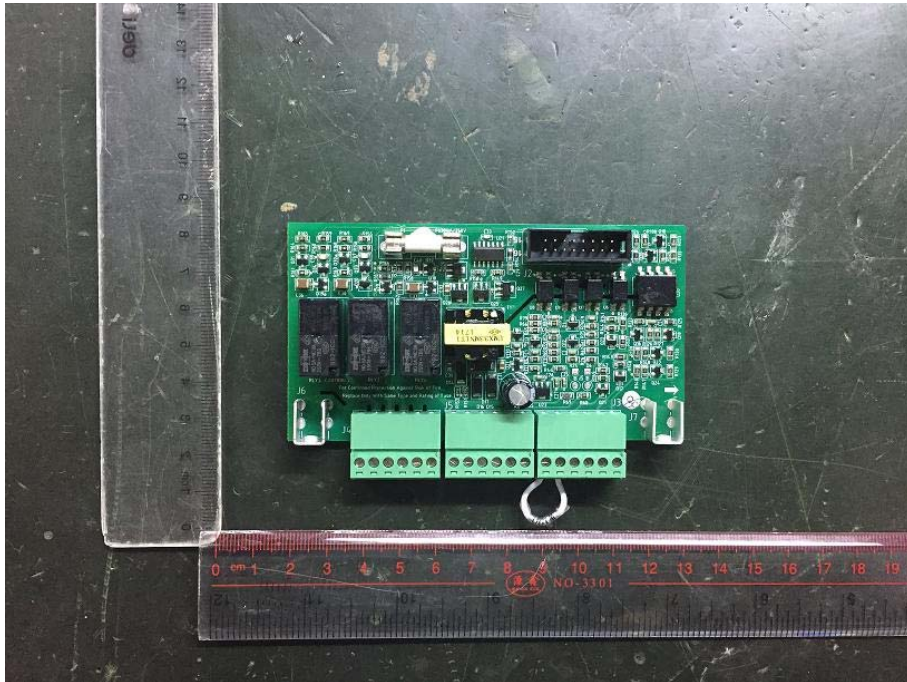












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