

Certificate of Conformity

NO.: ES170731049E

The following product has been tested by us with the listed standards and found in conformity with the council EMC directive 2014/30/EU. It is possible to use CE marking to demonstrate the conformity with this EMC Directive.

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
Trade Mark : INVT
EUT : Uninterruptible Power Systems
M/N : PM20C, PM25C
Test Standards : EN 62040-2: 2006
EN 61000-3-12: 2011
EN 61000-3-11: 2000



The certificate is based on a single evaluation of one sample of above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab. logo.

Standards EN62040-2: 2006

TEST REPORT

For

INVT POWER SYSTEM(SHENZHEN) CO., LTD

Uninterruptible Power Systems

Model Number: PM20C, PM25C

Prepared for : INVT POWER SYSTEM(SHENZHEN) CO., LTD
Address : 5# Building, Gaofa Industrial Park, Longjing, Nanshan District, Shenzhen, China, 518055

Prepared by : EMTEK (SHENZHEN) CO., LTD.
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Report Number : ES170731049E
Date of Test : August 03, 2017 to September 06, 2017
Date of Report : September 06, 2017

TABLE OF CONTENT

Description	Page
1. SUMMARY OF TEST RESULTS.....	7
2. GENERAL INFORMATION	8
2.1. Description of Device (EUT)	8
2.2. Description of Support Device	8
2.3. Description of Test Facility	8
2.4. Measurement Uncertainty	9
3. MEASURING DEVICE AND TEST EQUIPMENT	10
3.1. For Conducted Emission Measurement	10
3.2. For Radiated Emission Measurement	10
3.3. For Harmonic Current / Flicker Measurement	10
3.4. For Electrostatic Discharge Immunity Test	11
3.5. For RF Strength Susceptibility Test	11
3.6. For Electrical Fast Transient/Burst Immunity Test	11
3.7. For Surge Immunity Test.....	11
3.8. For Injected Current Susceptibility Test.....	12
3.9. For Magnetic Field Immunity Test.....	12
3.10. For Voltage Dips and Interruptions Test	12
3.11. Low Frequency Signals and Power Line Unbalance Test	12
4. CONDUCTED EMISSION MEASUREMENT	13
4.1. Block Diagram of Test Setup	13
4.2. Measuring Standard.....	13
4.3. Power Line Conducted Emission Limits (C3)	13
4.4. EUT Configuration of Measurement	13
4.5. Operating Condition of EUT	14
4.6. Test Procedure.....	14
4.7. Measuring Results	14
5. RADIATED EMISSION MEASUREMENT.....	19
5.1. Block Diagram of Test.....	19
5.2. Measuring Standard.....	19
5.3. Radiated Emission Limits(C3)	19
5.4. EUT Configuration on Test.....	20
5.5. Operating Condition of EUT	20
5.6. Test Procedure.....	20
5.7. Measuring Results	20
6. HARMONIC CURRENT EMISSION MEASUREMENT	23
6.1. Block Diagram of Test Setup	23
6.2. Measuring Standard.....	23
6.3. Operation Condition of EUT	23
6.4. Measuring Results	23
7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT	34
7.1. Block Diagram of Test Setup	34
7.2. Measuring Standard.....	34
7.3. Operation Condition of EUT	34
7.4. Measuring Results	34
8. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION	41
9. ELECTROSTATIC DISCHARGE IMMUNITY TEST	43
9.1. Block Diagram of Test Setup	43
9.2. Test Standard.....	43
9.3. Severity Levels and Performance Criterion	43
9.4. EUT Configuration	44
9.5. Operating Condition of EUT	44

9.6. Test Procedure.....	44
9.7. Test Results	44
10. RF FIELD STRENGTH SUSCEPTIBILITY TEST	46
10.1. Block Diagram of Test.....	46
10.2. Test Standard.....	46
10.3. Severity Levels and Performance Criterion	47
10.4. EUT Configuration on Test.....	47
10.5. Operating Condition of EUT	47
10.6. Test Procedure.....	47
10.7. Test Results	47
11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST.....	49
11.1. Block Diagram of Test Setup	49
11.2. Test Standard.....	49
11.3. Severity Levels and Performance Criterion	49
11.4. EUT Configuration	50
11.5. Operating Condition of EUT	50
11.6. Test Procedure.....	50
11.7. Test Result.....	50
12. SURGE IMMUNITY TEST	52
12.1. Block Diagram of Test Setup	52
12.2. Test Standard.....	52
12.3. Severity Levels and Performance Criterion	52
12.4. EUT Configuration	53
12.5. Operating Condition of EUT	53
12.6. Test Procedure.....	53
12.7. Test Result.....	53
13. INJECTED CURRENTS SUSCEPTIBILITY TEST	55
13.1. Block Diagram of Test Setup	55
13.2. Test Standard.....	55
13.3. Severity Levels and Performance Criterion	55
13.4. EUT Configuration	56
13.5. Operating Condition of EUT	56
13.6. Test Procedure.....	56
13.7. Test Results	56
14. MAGNETIC FIELD SUSCEPTIBILITY TEST.....	58
14.1. Block Diagram of Test.....	58
14.2. Test Standard.....	58
14.3. Severity Levels and Performance Criterion	58
14.4. EUT Configuration on Test.....	59
14.5. Test Procedure.....	59
14.6. Test Results	59
15. VOLTAGE DIPS AND INTERRUPTIONS TEST	61
15.1. Block Diagram of Test Setup	61
15.2. Test Standard.....	61
15.3. Severity Levels and Performance Criterion	61
15.4. EUT Configuration	62
15.5. Operating Condition of EUT	62
15.6. Test Procedure.....	62
15.7. Test Result.....	62
16. LOW FREQUENCY SIGNALS TEST.....	64
16.1. Block Diagram of Test Setup	64
16.2. Test Standard.....	64
16.3. Operating Condition of EUT	64
16.4. Test Results	64

17. POWER LINE UNBALANCE (THREE-PHASE UPS SYSTEMS ONLY)	66
17.1. Block Diagram of Test Setup	66
17.2. Test Standard.....	66
17.3. Operating Condition of EUT	66
17.4. Test Results	67
18. TEST PHOTOGRAPHS	69
18.1. Photos of Conducted Emission Measurement	69
18.2. Photos of Radiation Emission Measurement	70
18.3. Photo of Harmonic / Flicker Measurement	71
18.4. Photo of Electrostatic Discharge Test.....	71
18.5. Photo of RF Field Strength susceptibility Test	72
18.6. Photos of Electrical Fast Transient/Burst Test.....	72
18.7. Photo of Surge Test	73
18.8. Photo of Injected Currents Susceptibility Test	73
18.9. Photo of Magnetic Field Immunity Test.....	74
18.10. Photo of Voltage dips and interruption Test.....	74
18.11. Photo of Low Frequency Signals Test and Power Line Unbalance Test	75
APPENDIX (PHOTOS OF EUT) (15 PAGES)	

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 : PM20C, PM25C
Power Supply : PM20C :
Input: 380/400/415VAC, 50/60Hz, 39Amax
Output: 380/400/415VAC, 50/60Hz, 20KVA/20KW
PM25C:
Input: 380/400/415VAC, 50/60Hz, 48Amax
Output: 380/400/415VAC, 50/60Hz, 25KVA/25KW

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 September 06, 2017

Prepared by : 

Kirro Jin/Editor

Reviewer : 

Jessie Hu/Supervisor

Approved & Authorized Signer : 

Lisa Wang/Manager

Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ES170731049E	/	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	:	PM20C, PM25C (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 PM25C for test)
Test voltage	:	AC 380V/50Hz
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 September 06, 2017

2.2. Description of Support Device

N/A

2.3. Description of Test Facility

Site Description	:	Accredited by CNAS, 2016.10.24
EMC Lab.	:	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 checked="" type="checkbox"/>	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	May 20, 2017	1 Year
<input checked="" type="checkbox"/>	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	May 20, 2017	1 Year
<input 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 type="checkbox"/>	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 21, 2017	1 Year
<input 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 checked="" 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	N/A	May 21, 2017	1 Year
<input type="checkbox"/>	Broad-Band Horn Antenna	SCHWARZBECK	STLP 9149	9149-227	May 21, 2017	1 Year
<input type="checkbox"/>	Multi-function interface system	DARE	CTR1009B	12I00250SN O72	N/A	N/A
<input 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"/>	Three phase CDN	Teseq	CDN M332S	32655	May 21, 2017	1 Year
<input type="checkbox"/>	Three phase CDN	Teseq	CDN M432S	33670	May 21, 2017	1 Year
<input checked="" type="checkbox"/>	Three phase CDN	Teseq	CDN M532S	33799	May 21, 2017	1 Year
<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

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

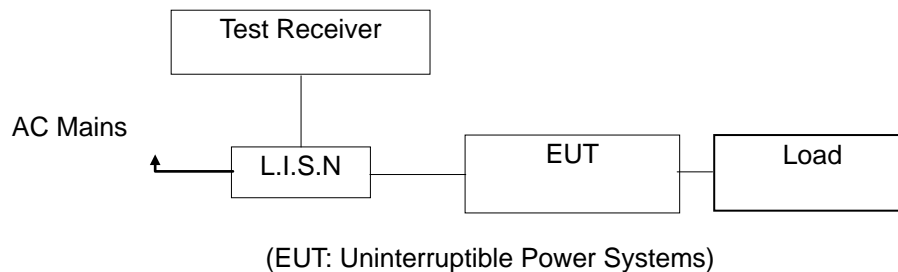
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 20, 2017	1 Year
<input type="checkbox"/>	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 : PM25C
 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.

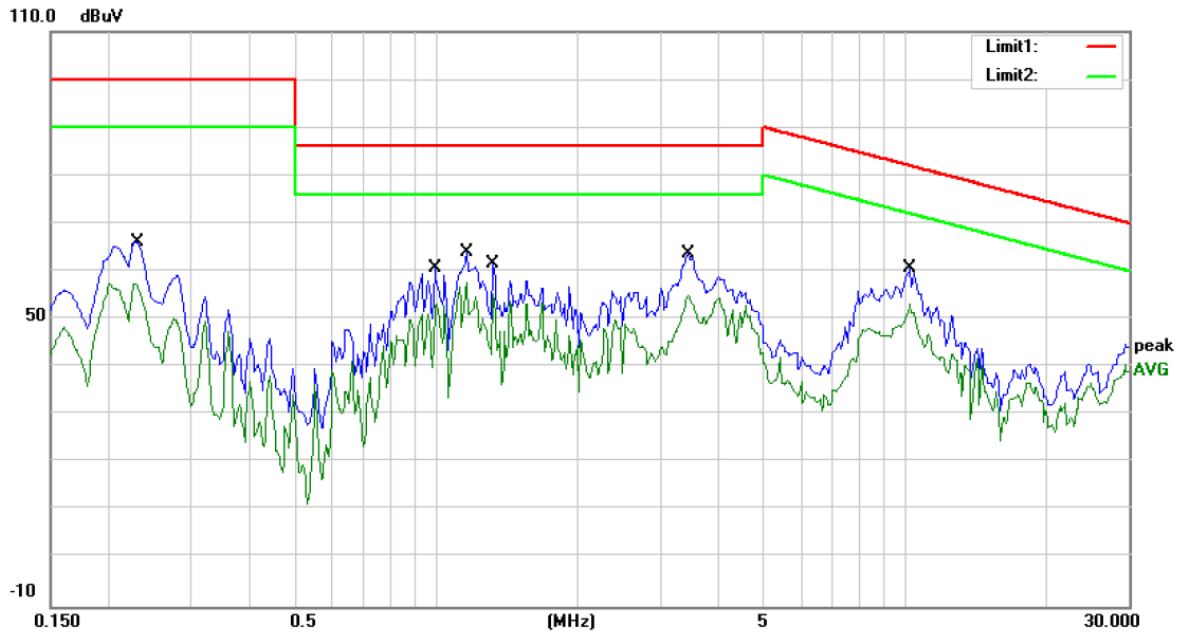
The frequency range from 150kHz to 30MHz is investigated.

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: 26

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

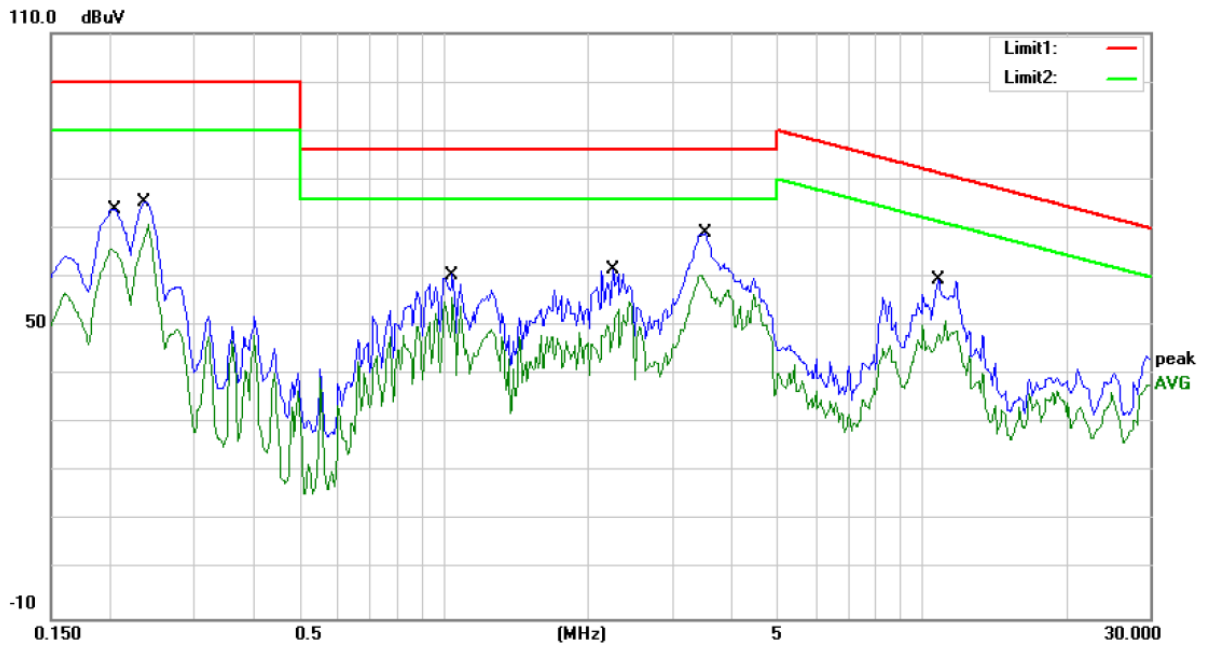
Humidity: 60 %

Mode: BAT MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2300	66.17	0.00	66.17	100.00	-33.83	QP	
2		0.2300	57.48	0.00	57.48	90.00	-32.52	AVG	
3		0.9900	60.76	0.00	60.76	86.00	-25.24	QP	
4		0.9900	53.13	0.00	53.13	76.00	-22.87	AVG	
5		1.1600	63.91	0.00	63.91	86.00	-22.09	QP	
6	*	1.1600	57.75	0.00	57.75	76.00	-18.25	AVG	
7		1.3200	61.64	0.00	61.64	86.00	-24.36	QP	
8		1.3200	55.33	0.00	55.33	76.00	-20.67	AVG	
9		3.4400	63.51	0.00	63.51	86.00	-22.49	QP	
10		3.4400	54.84	0.00	54.84	76.00	-21.16	AVG	
11		10.2500	60.79	0.00	60.79	81.99	-21.20	QP	
12		10.2500	53.16	0.00	53.16	71.99	-18.83	AVG	

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



Site :10m Chamber #1

Phase: **L2**

Temperature: 26

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

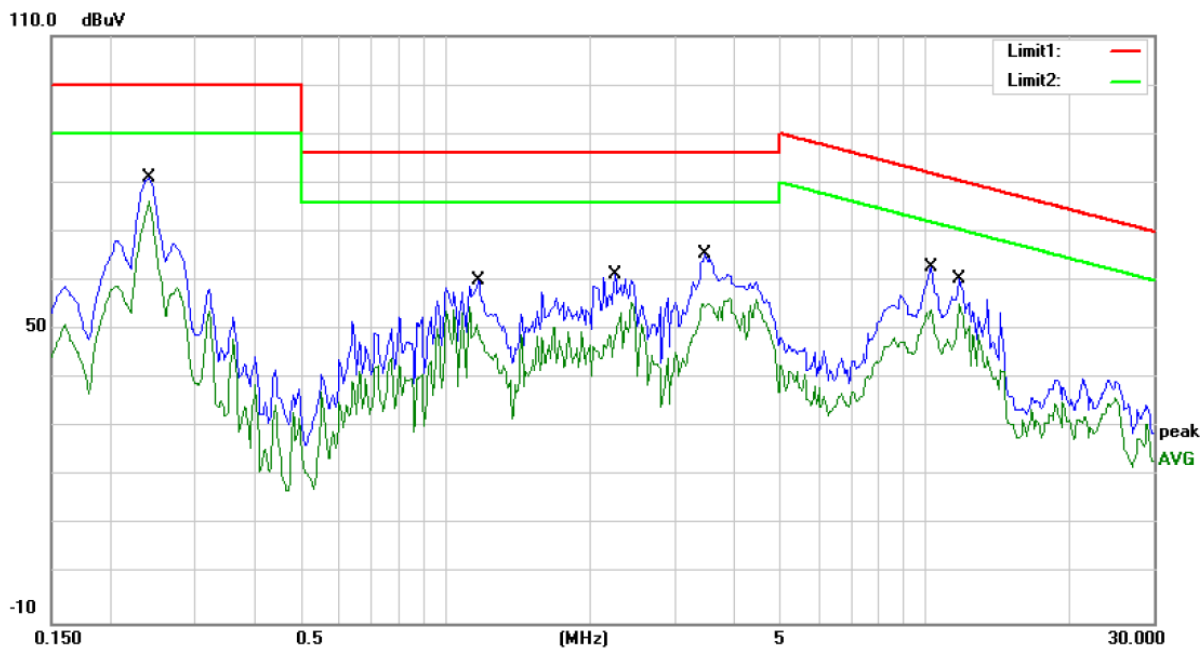
Humidity: 60 %

Mode: BAT MODE

Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.2050	73.75	0.00	73.75	100.00	-26.25	QP	
2	0.2050	65.81	0.00	65.81	90.00	-24.19	AVG	
3	0.2350	75.29	0.00	75.29	100.00	-24.71	QP	
4	0.2350	70.72	0.00	70.72	90.00	-19.28	AVG	
5	1.0400	60.50	0.00	60.50	86.00	-25.50	QP	
6	1.0400	55.83	0.00	55.83	76.00	-20.17	AVG	
7	2.2500	61.65	0.00	61.65	86.00	-24.35	QP	
8	2.2500	55.01	0.00	55.01	76.00	-20.99	AVG	
9	3.5100	69.03	0.00	69.03	86.00	-16.97	QP	
10 *	3.5100	60.46	0.00	60.46	76.00	-15.54	AVG	
11	10.8250	59.40	0.00	59.40	81.38	-21.98	QP	
12	10.8250	51.03	0.00	51.03	71.38	-20.35	AVG	

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



Site :10m Chamber #1

Phase: **L3**

Temperature: 26

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

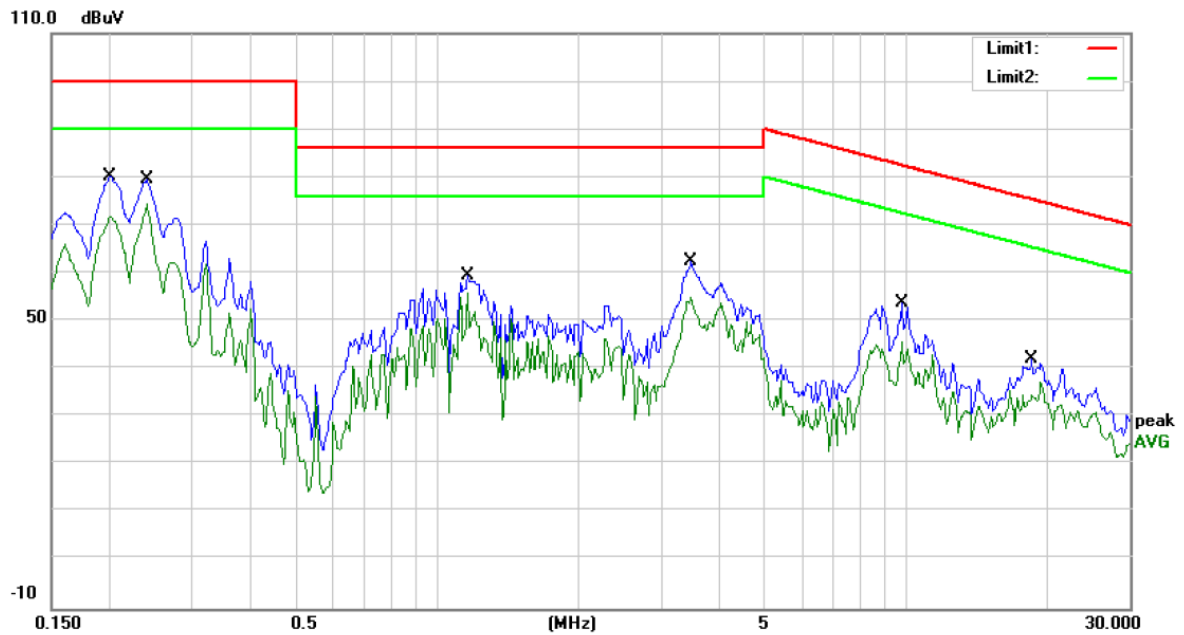
Humidity: 60 %

Mode: BAT MODE

Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.2400	80.99	0.00	80.99	100.00	-19.01	QP	
2 *	0.2400	76.35	0.00	76.35	90.00	-13.65	AVG	
3	1.1700	59.99	0.00	59.99	86.00	-26.01	QP	
4	1.1700	54.56	0.00	54.56	76.00	-21.44	AVG	
5	2.2500	61.13	0.00	61.13	86.00	-24.87	QP	
6	2.2500	53.51	0.00	53.51	76.00	-22.49	AVG	
7	3.4700	65.44	0.00	65.44	86.00	-20.56	QP	
8	3.4700	56.32	0.00	56.32	76.00	-19.68	AVG	
9	10.3000	62.76	0.00	62.76	81.93	-19.17	QP	
10	10.3000	54.17	0.00	54.17	71.93	-17.76	AVG	
11	11.7500	60.24	0.00	60.24	80.46	-20.22	QP	
12	11.7500	55.14	0.00	55.14	70.46	-15.32	AVG	

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



Site :10m Chamber #1

Phase: **N**

Temperature: 26

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

Humidity: 60 %

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	80.29	0.00	80.29	100.00	-19.71	QP	
2		0.2000	71.83	0.00	71.83	90.00	-18.17	AVG	
3		0.2400	79.57	0.00	79.57	100.00	-20.43	QP	
4	*	0.2400	74.37	0.00	74.37	90.00	-15.63	AVG	
5		1.1600	59.43	0.00	59.43	86.00	-26.57	QP	
6		1.1600	55.94	0.00	55.94	76.00	-20.06	AVG	
7		3.4800	62.37	0.00	62.37	86.00	-23.63	QP	
8		3.4800	55.04	0.00	55.04	76.00	-20.96	AVG	
9		9.8000	53.73	0.00	53.73	82.49	-28.76	QP	
10		9.8000	45.73	0.00	45.73	72.49	-26.76	AVG	
11		18.6000	41.93	0.00	41.93	75.34	-33.41	QP	
12		18.6000	37.14	0.00	37.14	65.34	-28.20	AVG	

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

5. RADIATED EMISSION MEASUREMENT

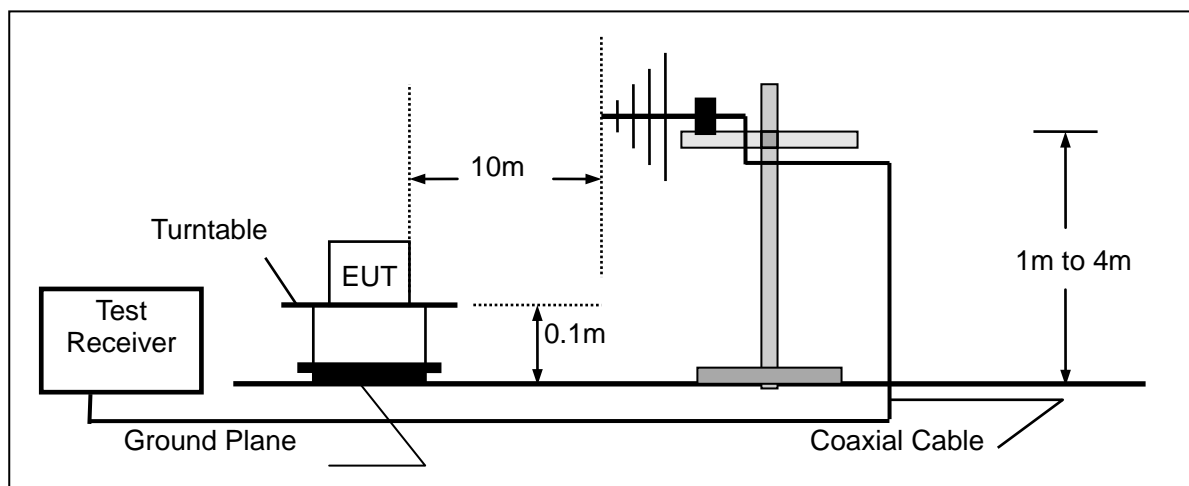
5.1. Block Diagram of Test

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.

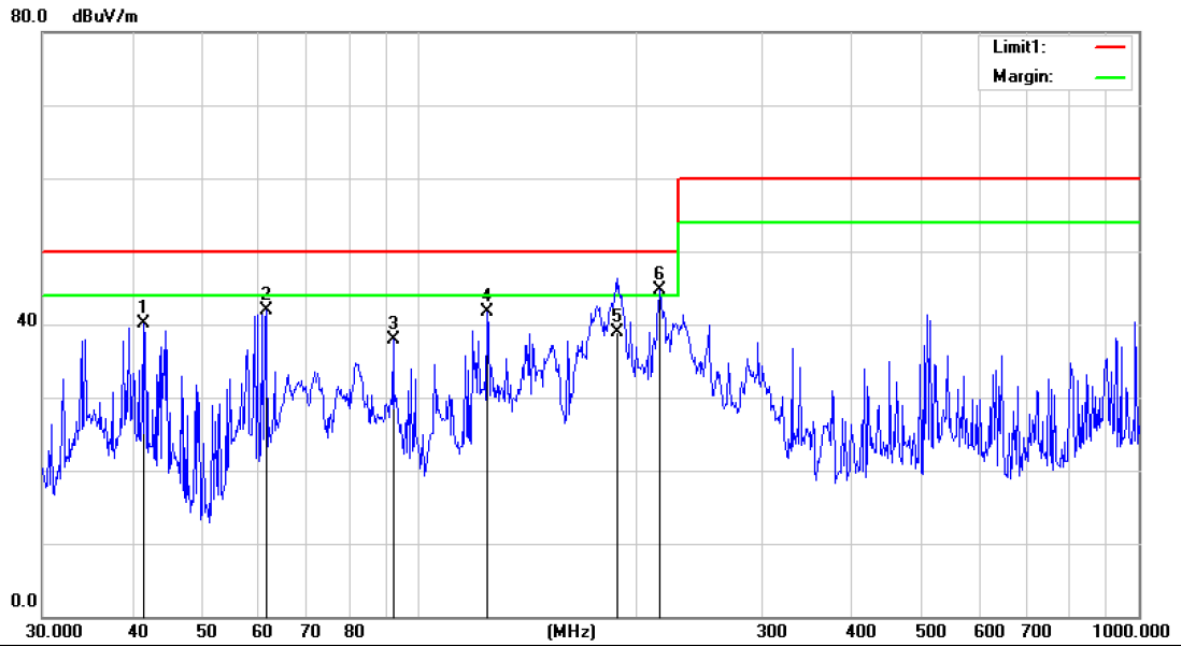
The bandwidth of the Receiver is set at 120kHz.

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 %

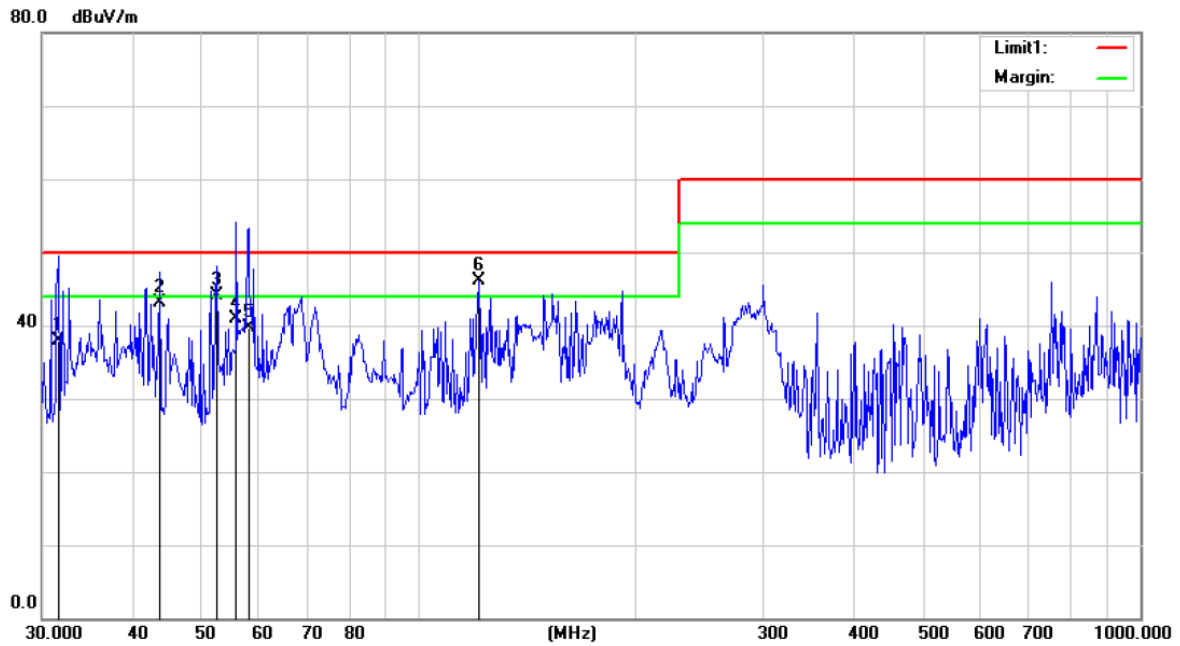
Mode:ine mode

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		41.4215	69.61	-29.55	40.06	50.00	-9.94	303	359	
2		61.3463	73.28	-31.40	41.88	50.00	-8.12	400	211	
3		92.1388	70.65	-32.74	37.91	50.00	-12.09	400	250	
4		124.5690	74.94	-33.17	41.77	50.00	-8.23	303	359	
5		189.0743	70.58	-31.58	39.00	50.00	-11.00	400	6	
6	*	216.0240	74.46	-29.80	44.66	50.00	-5.34	303	359	

*: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:

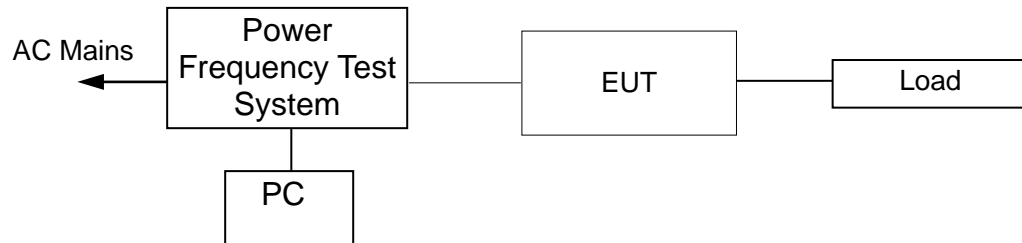
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		31.6202	69.21	-31.31	37.90	50.00	-12.10	QP	199	359
2		43.6584	73.98	-30.78	43.20	50.00	-6.80	QP	199	359
3	!	52.3912	72.59	-28.49	44.10	50.00	-5.90	QP	199	359
4		55.8047	69.64	-28.74	40.90	50.00	-9.10	QP	100	183
5		57.9993	68.65	-28.92	39.73	50.00	-10.27	QP	199	359
6	*	121.1231	76.97	-30.87	46.10	50.00	-3.90	QP	199	359

*: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.

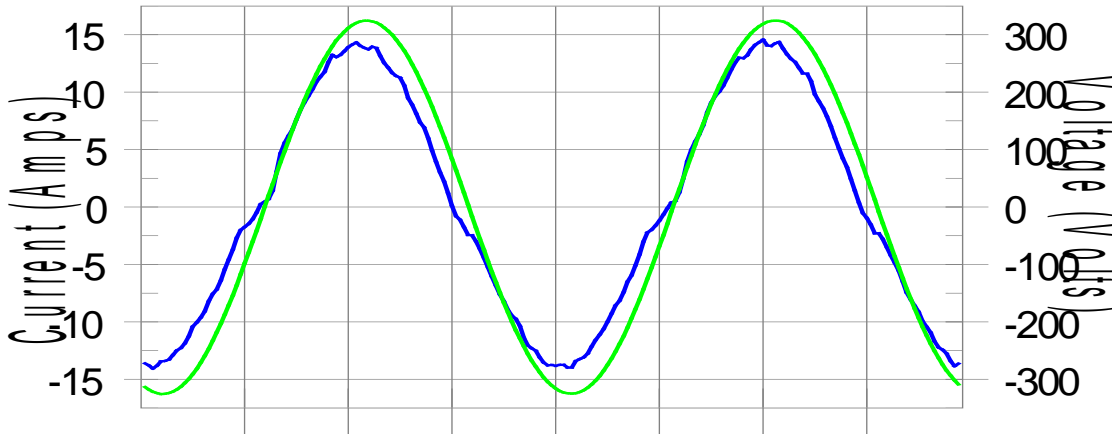
Harmonics – Per EN/IEC61000-3-12(Phase A-Run time)

EUT: UPS
 Test category: Table:3, R_{sce}=33, Inter-Harm,)
 Test date: 2017/8/26
 Test duration (min): 2.5
 Comment: LINE MODE
 Customer: INVT

Tested by: LB
 Test Margin: 100
 Start time: 9:38:03
 End time: 9:40:56
 Data file name: WIN2106_H-000008.cts_data

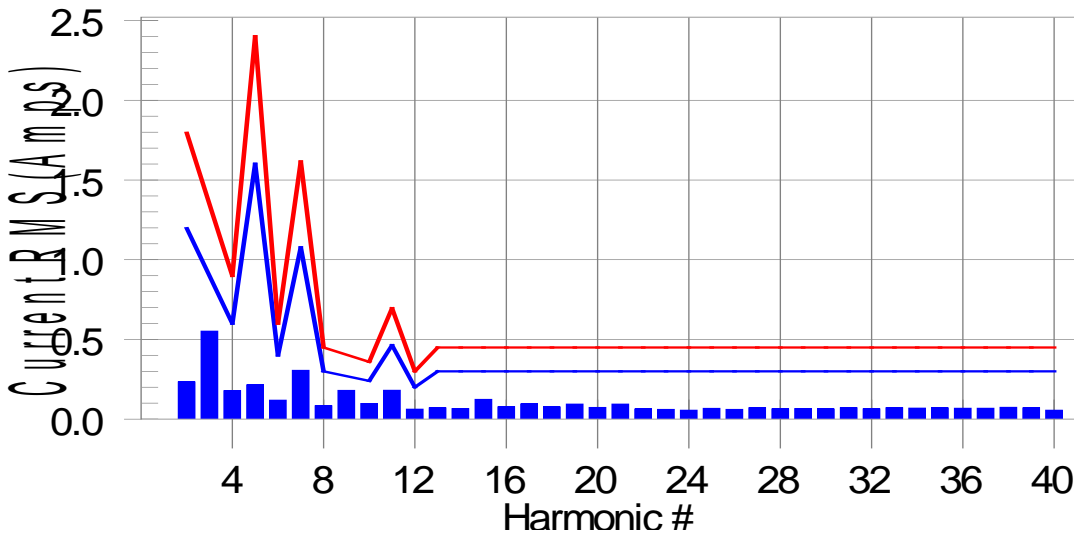
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 3 limit line

European Limits



Test result: Pass Worst harmonic was #11 with 91.68 % of the limit.

Current Test Result Summary (Phase A-Run time)

EUT: UPS Tested by: LB
 Test category: Table:3, R_{sce}=33, Inter-Harm,) Test Margin: 100
 Test date: 2017/8/26 Start time: 9:38:03 End time: 9:40:56
 Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Measured I-ref: 14.915 Amp rms Source: Normal
 I-THC(%): 6.1 Limit(%): 13.0 PWHC(%): 15.5 PWHC Limit(%): 22.0

Highest parameter values during test:

V _{RMS} (Volts):	229.80	Frequency(Hz):	50.00
I _{Peak} (Amps):	45.897	I _{RMS} (Amps):	27.489
I _{Fund} (Amps):	26.915	Crest Factor:	2.388
Power (Watts):	6230	Power Factor:	0.993

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.234	1.197	19.5	0.287	1.796	16.0	Pass
3	0.553	N/A	N/A	0.788	N/A	N/A	N/A
4	0.179	0.599	29.9	0.194	0.898	21.6	Pass
5	0.216	1.601	13.5	0.494	2.402	20.6	Pass
6	0.120	0.399	30.1	0.165	0.599	27.5	Pass
7	0.307	1.078	28.5	0.477	1.616	29.5	Pass
8	0.084	0.299	28.0	0.117	0.449	26.1	Pass
9	0.181	N/A	N/A	0.284	N/A	N/A	N/A
10	0.099	0.239	41.4	0.144	0.359	40.1	Pass
11	0.182	0.464	39.3	0.360	0.696	51.8	Pass
12	0.063	0.200	31.6	0.150	0.299	50.1	Pass
13	0.071	0.299	23.7	0.124	0.449	27.5	Pass
14	0.067	N/A	N/A	0.110	N/A	N/A	N/A
15	0.125	N/A	N/A	0.302	N/A	N/A	N/A
16	0.078	N/A	N/A	0.133	N/A	N/A	N/A
17	0.096	N/A	N/A	0.168	N/A	N/A	N/A
18	0.077	N/A	N/A	0.119	N/A	N/A	N/A
19	0.095	N/A	N/A	0.163	N/A	N/A	N/A
20	0.074	N/A	N/A	0.133	N/A	N/A	N/A
21	0.095	N/A	N/A	0.165	N/A	N/A	N/A
22	0.064	N/A	N/A	0.106	N/A	N/A	N/A
23	0.062	N/A	N/A	0.125	N/A	N/A	N/A
24	0.057	N/A	N/A	0.108	N/A	N/A	N/A
25	0.068	N/A	N/A	0.124	N/A	N/A	N/A
26	0.062	N/A	N/A	0.117	N/A	N/A	N/A
27	0.072	N/A	N/A	0.134	N/A	N/A	N/A
28	0.065	N/A	N/A	0.123	N/A	N/A	N/A
29	0.067	N/A	N/A	0.121	N/A	N/A	N/A
30	0.064	N/A	N/A	0.125	N/A	N/A	N/A
31	0.072	N/A	N/A	0.140	N/A	N/A	N/A
32	0.065	N/A	N/A	0.128	N/A	N/A	N/A
33	0.072	N/A	N/A	0.154	N/A	N/A	N/A
34	0.070	N/A	N/A	0.149	N/A	N/A	N/A
35	0.071	N/A	N/A	0.144	N/A	N/A	N/A
36	0.069	N/A	N/A	0.146	N/A	N/A	N/A
37	0.069	N/A	N/A	0.138	N/A	N/A	N/A
38	0.075	N/A	N/A	0.152	N/A	N/A	N/A
39	0.071	N/A	N/A	0.139	N/A	N/A	N/A
40	0.057	N/A	N/A	0.118	N/A	N/A	N/A

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

Voltage Source Verification Data (Phase A-Run time)

EUT: UPS
 Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
 Test date: 2017/8/26 Start time: 9:38:03 End time: 9:40:56
 Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
 Comment: LINE MODE
 Customer: INVT

Tested by: LB

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:

V_RMS (Volts):	229.80	Frequency(Hz):	50.00
I_Peak (Amps):	45.897	I_RMS (Amps):	27.489
I_Fund (Amps):	26.915	Crest Factor:	2.388
Power (Watts):	6230	Power Factor:	0.993

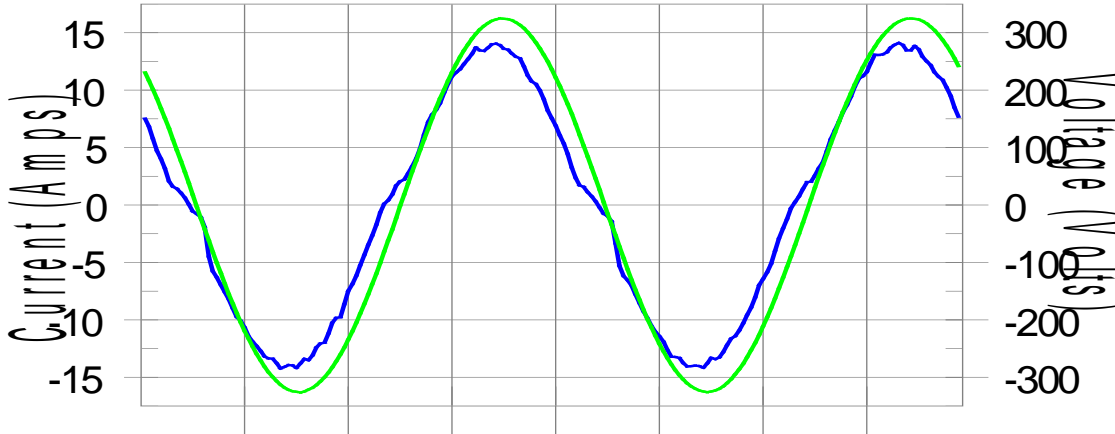
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.315	0.918	34.34	OK
3	0.227	2.868	7.93	OK
4	0.104	0.918	11.32	OK
5	0.102	3.441	2.96	OK
6	0.076	0.918	8.23	OK
7	0.169	2.868	5.91	OK
8	0.089	0.917	9.71	OK
9	0.102	1.376	7.43	OK
10	0.125	0.918	13.66	OK
11	0.218	1.606	13.55	OK
12	0.109	0.688	15.89	OK
13	0.156	1.377	11.31	OK
14	0.147	0.688	21.34	OK
15	0.274	0.688	39.84	OK
16	0.155	0.688	22.51	OK
17	0.218	0.688	31.68	OK
18	0.140	0.688	20.32	OK
19	0.229	0.688	33.33	OK
20	0.138	0.688	20.09	OK
21	0.275	0.688	39.88	OK
22	0.151	0.688	21.94	OK
23	0.195	0.688	28.38	OK
24	0.126	0.688	18.30	OK
25	0.193	0.688	28.02	OK
26	0.137	0.688	19.84	OK
27	0.243	0.688	35.24	OK
28	0.138	0.688	20.09	OK
29	0.169	0.688	24.62	OK
30	0.165	0.688	23.93	OK
31	0.226	0.688	32.88	OK
32	0.136	0.688	19.70	OK
33	0.282	0.688	40.96	OK
34	0.223	0.688	32.39	OK
35	0.211	0.688	30.66	OK
36	0.202	0.688	29.31	OK
37	0.277	0.688	40.24	OK
38	0.261	0.688	37.92	OK
39	0.205	0.688	29.79	OK
40	0.234	0.688	34.04	OK

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

EUT: UPS
 Test category: Table:3, R_{sce}=33, Inter-Harm,) Tested by: LB
 Test date: 2017/8/26 Start time: 9:38:03 Test Margin: 100
 Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data End time: 9:40:56
 Comment: LINE MODE
 Customer: INVT

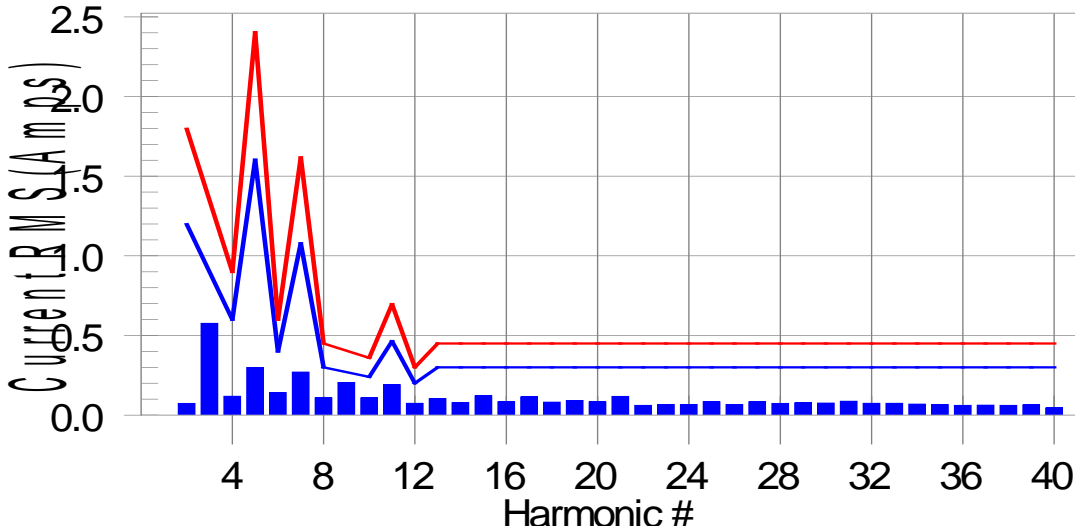
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 3 limit line

European Limits



Test result: Pass Worst harmonic was #11 with 88.94 % of the limit.

Current Test Result Summary (Phase B-Run time)

EUT: UPS Tested by: LB
 Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
 Test date: 2017/8/26 Start time: 9:38:03 End time: 9:40:56
 Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Measured I-ref: 14.925 Amp rms Source: Normal
 I-THC(%): 6.2 Limit(%): 13.0 PWHC(%): 15.7 PWHC Limit(%): 22.0

Highest parameter values during test:

V_RMS (Volts): 229.91	Frequency(Hz): 50.00
I_Peak (Amps): 40.554	I_RMS (Amps): 27.744
I_Fund (Amps): 25.925	Crest Factor: 2.314
Power (Watts): 6215	Power Factor: 0.990

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.074	1.198	6.2	0.106	1.797	5.9	Pass
3	0.553	N/A	N/A	0.799	N/A	N/A	N/A
4	0.119	0.599	19.9	0.161	0.899	17.9	Pass
5	0.300	1.603	18.7	0.621	2.404	25.8	Pass
6	0.142	0.399	35.6	0.155	0.599	25.9	Pass
7	0.271	1.078	25.1	0.403	1.618	24.9	Pass
8	0.109	0.300	36.2	0.162	0.449	36.0	Pass
9	0.181	N/A	N/A	0.353	N/A	N/A	N/A
10	0.109	0.240	45.4	0.157	0.359	43.7	Pass
11	0.192	0.464	41.3	0.357	0.696	51.2	Pass
12	0.075	0.200	37.5	0.131	0.300	43.7	Pass
13	0.104	0.300	34.6	0.185	0.449	41.2	Pass
14	0.079	N/A	N/A	0.176	N/A	N/A	N/A
15	0.121	N/A	N/A	0.244	N/A	N/A	N/A
16	0.084	N/A	N/A	0.142	N/A	N/A	N/A
17	0.115	N/A	N/A	0.208	N/A	N/A	N/A
18	0.082	N/A	N/A	0.149	N/A	N/A	N/A
19	0.092	N/A	N/A	0.178	N/A	N/A	N/A
20	0.083	N/A	N/A	0.138	N/A	N/A	N/A
21	0.118	N/A	N/A	0.236	N/A	N/A	N/A
22	0.062	N/A	N/A	0.132	N/A	N/A	N/A
23	0.067	N/A	N/A	0.149	N/A	N/A	N/A
24	0.068	N/A	N/A	0.144	N/A	N/A	N/A
25	0.084	N/A	N/A	0.173	N/A	N/A	N/A
26	0.068	N/A	N/A	0.147	N/A	N/A	N/A
27	0.084	N/A	N/A	0.181	N/A	N/A	N/A
28	0.074	N/A	N/A	0.153	N/A	N/A	N/A
29	0.078	N/A	N/A	0.159	N/A	N/A	N/A
30	0.076	N/A	N/A	0.142	N/A	N/A	N/A
31	0.088	N/A	N/A	0.169	N/A	N/A	N/A
32	0.075	N/A	N/A	0.139	N/A	N/A	N/A
33	0.075	N/A	N/A	0.144	N/A	N/A	N/A
34	0.070	N/A	N/A	0.142	N/A	N/A	N/A
35	0.067	N/A	N/A	0.132	N/A	N/A	N/A
36	0.062	N/A	N/A	0.129	N/A	N/A	N/A
37	0.063	N/A	N/A	0.135	N/A	N/A	N/A
38	0.062	N/A	N/A	0.131	N/A	N/A	N/A
39	0.065	N/A	N/A	0.134	N/A	N/A	N/A
40	0.045	N/A	N/A	0.102	N/A	N/A	N/A

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

Voltage Source Verification Data (Phase B-Run time)

EUT: UPS
 Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
 Test date: 2017/8/26 Start time: 9:38:03 End time: 9:40:56
 Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
 Comment: LINE MODE
 Customer: INVT

Tested by: LB

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:

V_RMS (Volts): 229.91 Frequency(Hz): 50.00
 I_Peak (Amps): 40.554 I_RMS (Amps): 27.744
 I_Fund (Amps): 25.925 Crest Factor: 2.314
 Power (Watts): 6215 Power Factor: 0.990

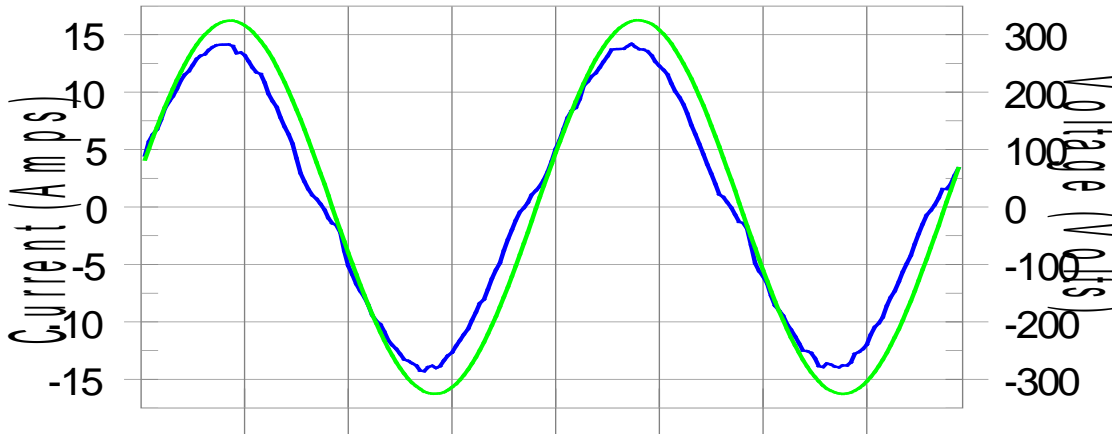
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.317	0.918	34.55	OK
3	0.192	2.868	6.70	OK
4	0.065	0.918	7.12	OK
5	0.085	3.444	2.48	OK
6	0.058	0.918	6.27	OK
7	0.132	2.870	4.60	OK
8	0.079	0.918	8.61	OK
9	0.093	1.377	6.78	OK
10	0.101	0.918	10.96	OK
11	0.196	1.607	12.19	OK
12	0.110	0.689	15.92	OK
13	0.124	1.377	9.01	OK
14	0.190	0.688	27.62	OK
15	0.269	0.688	39.04	OK
16	0.159	0.689	23.07	OK
17	0.240	0.688	34.91	OK
18	0.162	0.688	23.56	OK
19	0.179	0.688	26.07	OK
20	0.136	0.688	19.78	OK
21	0.330	0.688	47.90	OK
22	0.147	0.688	21.31	OK
23	0.214	0.688	31.06	OK
24	0.148	0.688	21.47	OK
25	0.213	0.688	30.91	OK
26	0.143	0.689	20.72	OK
27	0.208	0.688	30.16	OK
28	0.127	0.688	18.51	OK
29	0.210	0.688	30.44	OK
30	0.193	0.689	28.06	OK
31	0.239	0.689	34.68	OK
32	0.164	0.689	23.80	OK
33	0.156	0.689	22.65	OK
34	0.174	0.689	25.29	OK
35	0.175	0.689	25.35	OK
36	0.159	0.688	23.14	OK
37	0.186	0.688	27.00	OK
38	0.203	0.689	29.55	OK
39	0.167	0.689	24.21	OK
40	0.172	0.688	25.03	OK

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

EUT: UPS
 Test category: Table:3, R_{sce}=33, Inter-Harm,) Tested by: LB
 Test date: 2017/8/26 Start time: 9:38:03 Test Margin: 100
 Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
 Comment: LINE MODE
 Customer: INVT

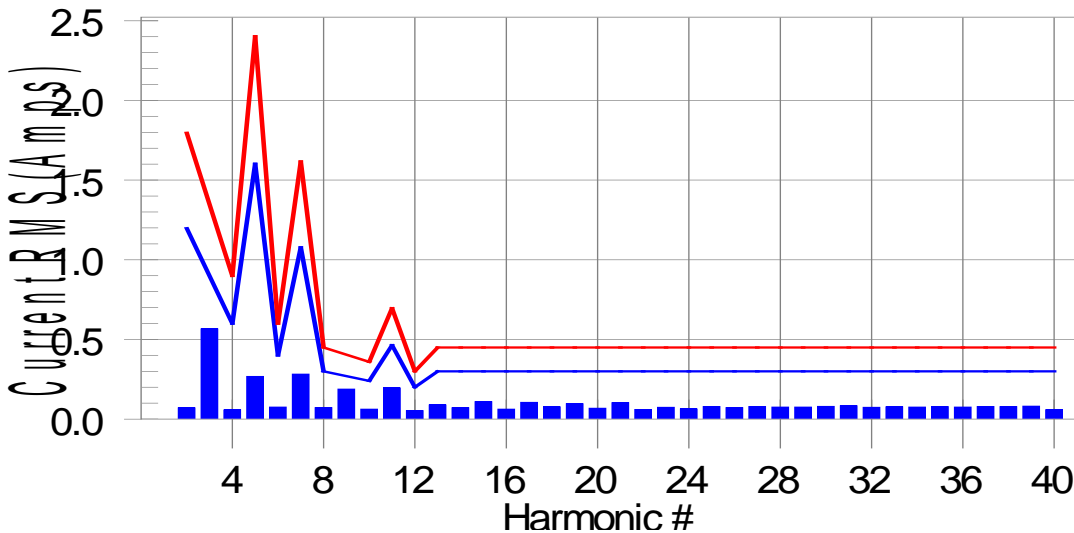
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class 3 limit line

European Limits



Test result: Pass Worst harmonic was #11 with 91.97 % of the limit.

Current Test Result Summary (Phase C-Run time)

EUT: UPS Tested by: LB
 Test category: Table:3, R_{sce}=33, Inter-Harm,) Test Margin: 100
 Test date: 2017/8/26 Start time: 9:38:03 End time: 9:40:56
 Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
 Comment: LINE MODE
 Customer: INVT

Test Result: Pass Measured I-ref: 14.923 Amp rms Source: Normal
 I-THC(%): 6.0 Limit(%): 13.0 PWHC(%): 16.8 PWHC Limit(%): 22.0

Highest parameter values during test:
 V_{RMS} (Volts): 229.85 Frequency(Hz): 50.00
 I_{Peak} (Amps): 41.244 I_{RMS} (Amps): 28.796
 I_{Fund} (Amps): 27.923 Crest Factor: 2.315
 Power (Watts): 6352 Power Factor: 0.991

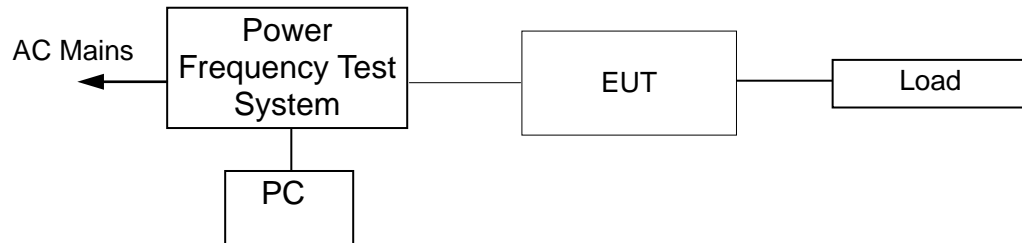
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.071	1.198	5.9	0.097	1.797	5.4	Pass
3	0.553	N/A	N/A	0.829	N/A	N/A	N/A
4	0.058	0.599	9.7	0.100	0.898	11.2	Pass
5	0.269	1.602	16.8	0.548	2.403	22.8	Pass
6	0.076	0.399	19.1	0.121	0.599	20.2	Pass
7	0.283	1.078	26.2	0.443	1.617	27.4	Pass
8	0.073	0.299	24.3	0.155	0.449	34.5	Pass
9	0.181	N/A	N/A	0.282	N/A	N/A	N/A
10	0.063	0.240	26.2	0.105	0.359	29.3	Pass
11	0.196	0.464	42.2	0.423	0.696	60.8	Pass
12	0.054	0.200	27.3	0.109	0.299	36.3	Pass
13	0.089	0.299	29.6	0.170	0.449	37.8	Pass
14	0.072	N/A	N/A	0.185	N/A	N/A	N/A
15	0.110	N/A	N/A	0.193	N/A	N/A	N/A
16	0.063	N/A	N/A	0.136	N/A	N/A	N/A
17	0.106	N/A	N/A	0.284	N/A	N/A	N/A
18	0.078	N/A	N/A	0.170	N/A	N/A	N/A
19	0.097	N/A	N/A	0.158	N/A	N/A	N/A
20	0.069	N/A	N/A	0.143	N/A	N/A	N/A
21	0.104	N/A	N/A	0.228	N/A	N/A	N/A
22	0.061	N/A	N/A	0.131	N/A	N/A	N/A
23	0.075	N/A	N/A	0.166	N/A	N/A	N/A
24	0.064	N/A	N/A	0.143	N/A	N/A	N/A
25	0.080	N/A	N/A	0.156	N/A	N/A	N/A
26	0.073	N/A	N/A	0.159	N/A	N/A	N/A
27	0.080	N/A	N/A	0.165	N/A	N/A	N/A
28	0.076	N/A	N/A	0.166	N/A	N/A	N/A
29	0.076	N/A	N/A	0.148	N/A	N/A	N/A
30	0.081	N/A	N/A	0.160	N/A	N/A	N/A
31	0.084	N/A	N/A	0.179	N/A	N/A	N/A
32	0.075	N/A	N/A	0.149	N/A	N/A	N/A
33	0.078	N/A	N/A	0.173	N/A	N/A	N/A
34	0.076	N/A	N/A	0.162	N/A	N/A	N/A
35	0.079	N/A	N/A	0.185	N/A	N/A	N/A
36	0.076	N/A	N/A	0.175	N/A	N/A	N/A
37	0.080	N/A	N/A	0.181	N/A	N/A	N/A
38	0.079	N/A	N/A	0.205	N/A	N/A	N/A
39	0.082	N/A	N/A	0.194	N/A	N/A	N/A
40	0.060	N/A	N/A	0.170	N/A	N/A	N/A

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

5th Harmonic Phase Angle and Magnitude for Phase A :**H-5_min_phase : 210.9 Degree (Leading)****H-5_max_phase : 297.7 Degree (Leading)****H-5_ave_phase : 233.8 Degree (Leading)****H-5_ave_vector_magnitude : 0.259 Amp****H-5_standard_ave_magnitude : 0.216 Amp****H-5_standard_max_magnitude : 0.548 Amp****Ratio of H-5_ave_vector / H-5_standard_ave : 0.892****Phase A = 71.323% of tested Rsce = 33.000, Rsce = 23.536****Phase B = 72.022% of tested Rsce = 33.000, Rsce = 23.767****Phase C = 77.063% of tested Rsce = 33.000, Rsce = 25.431****Minimum Rsce required: Rsce = 25.431**

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.

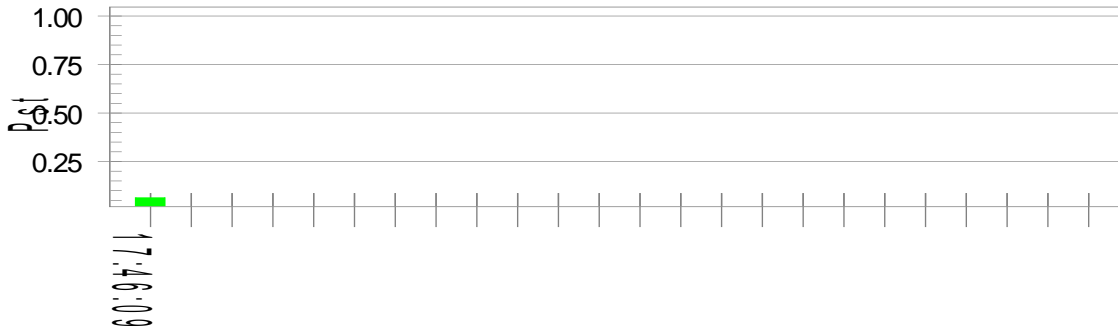
Please see the following pages.

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

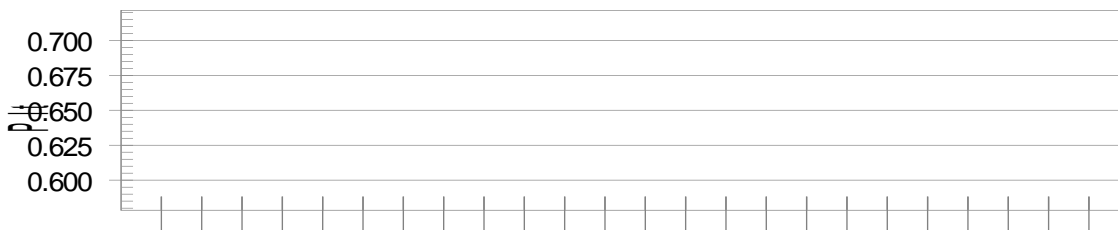
EUT: UPS Test category: All parameters Test date: 2017/8/26 Test duration (min): 10 LINE MODE: LINE MODE Customer: INVT Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)	Tested by: Tested by Test Margin: 100 Start time: 17:36:01 End time: 17:46:10 Data file name: WIN2106_F-000326.cts_data
---	--

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): 227.54

T-max (mS):	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.06	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650	Pass

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

Calculated Pst : 0.085
Calculated Plt : 0.037

The maximum permissible system impedance Zsys:

Z-phase A = 9.647 Ohm + j 6.029 Ohm	(9.647 Ohm + 19192 ?H)
Z-neutral A = 6.431 Ohm + j 4.020 Ohm	(6.431 Ohm + 12795 ?H)

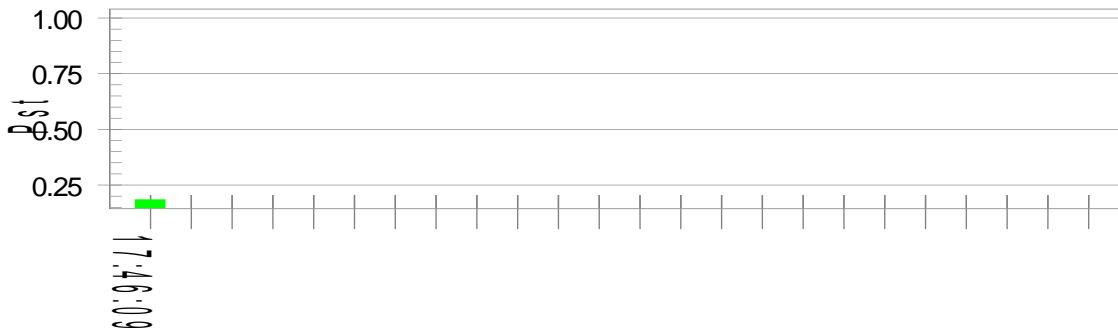
Flicker Test Summary (Phase B-Replay) per EN/IEC61000-3-11

EUT: UPS
Test category: All parameters
Test date: 2017/8/26
Test duration (min): 10
LINE MODE: LINE MODE
Customer: INVT
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)

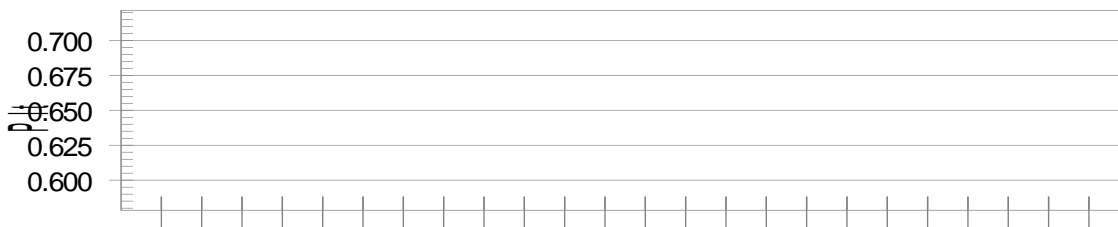
Tested by: Tested by
Test Margin: 100
Start time: 17:36:01
End time: 17:46:10
Data file name: WIN2106_F-000326.cts_data

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): 225.76

Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.09	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.185	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.081	Test limit:	0.650	Pass

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

Calculated Pst : 0.246
Calculated Plt : 0.108

The maximum permissible system impedance Zsys :

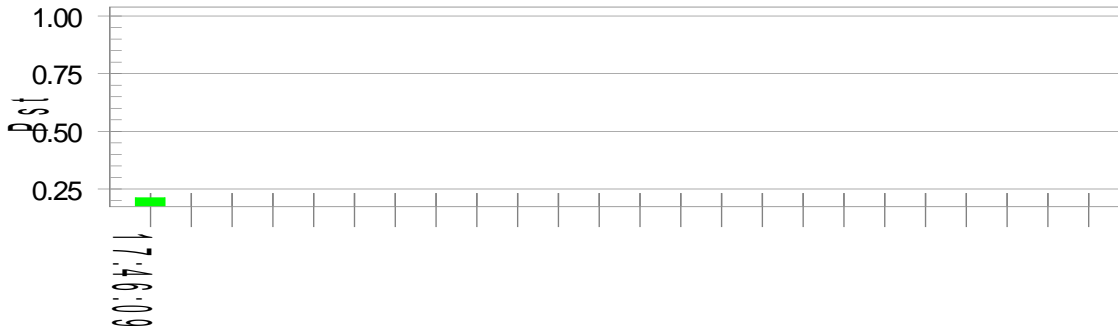
Z-phase B = 1.964 Ohm + j 1.227 Ohm (1.964 Ohm + 3906 ?H)
Z-neutral B = 1.309 Ohm + j 0.818 Ohm (1.309 Ohm + 2604 ?H)

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

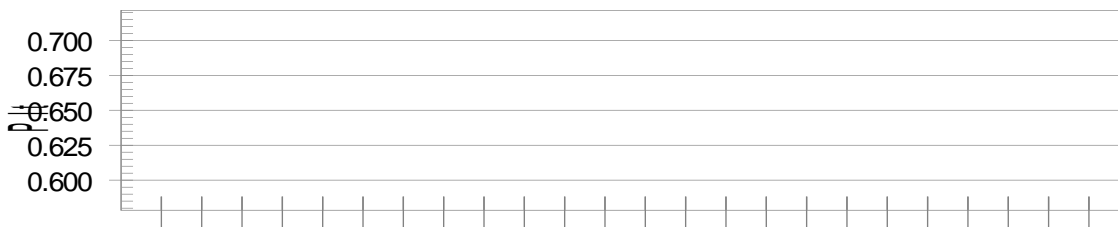
EUT: UPS Test category: All parameters Test date: 2017/8/26 Test duration (min): 10 LINE MODE: LINE MODE Customer: INVT Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)	Tested by: Tested by Test Margin: 100 Start time: 17:36:01 End time: 17:46:10 Data file name: WIN2106_F-000326.cts_data
---	--

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): 226.43

Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.08	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.213	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.093	Test limit:	0.650	Pass

Calculated dmax(%): 0.000
Calculated dc(%): 0.000
Calculated Pst : 0.284

Calculated Plt : 0.124

The maximum permissible system impedance Zsys :

Z-phase C = 1.588 Ohm + j 0.993 Ohm (1.588 Ohm + 3160 ?H)
Z-neutral C = 1.059 Ohm + j 0.662 Ohm (1.059 Ohm + 2107 ?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.

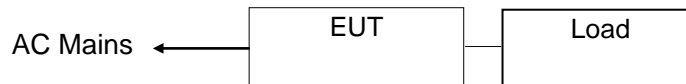
Criterion D

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

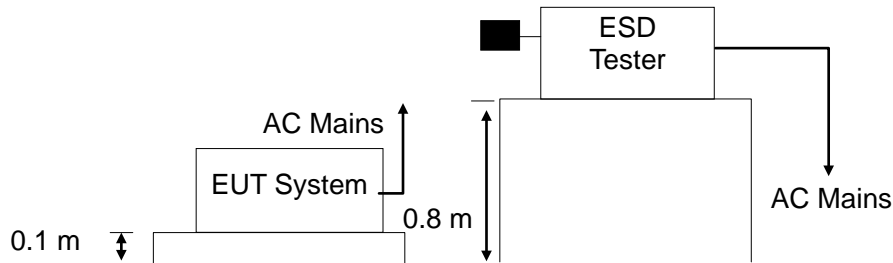
9.1. Block Diagram of Test Setup

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 : PM25C <hr/> Power Supply : AC 380V/50Hz <hr/> Test Mode : Line 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 438)		

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

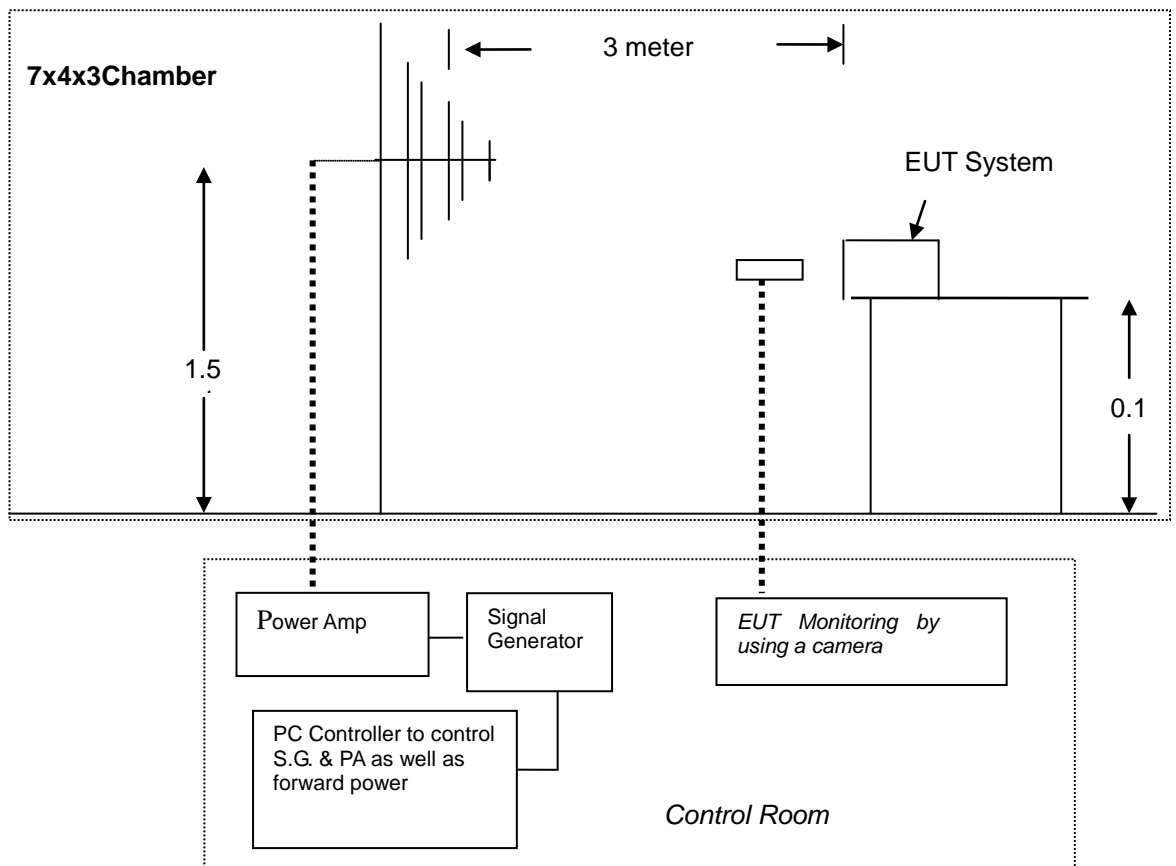
10.1. Block Diagram of Test

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 0.1m 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.

Applicant : INVT POWER SYSTEM(SHENZHEN) CO., LTD	Test Date : August 25, 2017
EUT : Uninterruptible Power Systems	Temperature : 22°C
M/N : PM25C	Humidity : 50%
Field Strength : 10V/m	Actual Criterion : A
Power Supply : AC 380V/50Hz	Test Mode : Line Mode
Test Engineer : ZZY	Frequency Range : 80 to 1000 MHz

Modulation: <input type="checkbox"/> None	<input type="checkbox"/> Pulse	<input checked="" type="checkbox"/> AM 1KHz	80%	
Frequency Rang 1: 80~ 1000MHz		Frequency Rang 2: N/A		
Steps	# / %	# / %	# / %	
	Horizontal	Vertical	Horizontal	Vertical
Front	A	A		
Right	A	A		
Rear	A	A		
Left	A	A		

Test Equipment :

- Signal Generator : N5181A (Agilent)
- Power Amplifier : 80RF1000-175 (MILMEGA) & AS0102-55 (MILMEGA)& AS1860-50 (MILMEGA)
- Log.-Per.Antenna: VULP9118E (SCHWARZBECK)
- Broad-Band Horn Antenna.: STLP9149 (SCHWARZBECK)
- Field Strength Meter: RSS1006A (DARE)

Note: /

11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

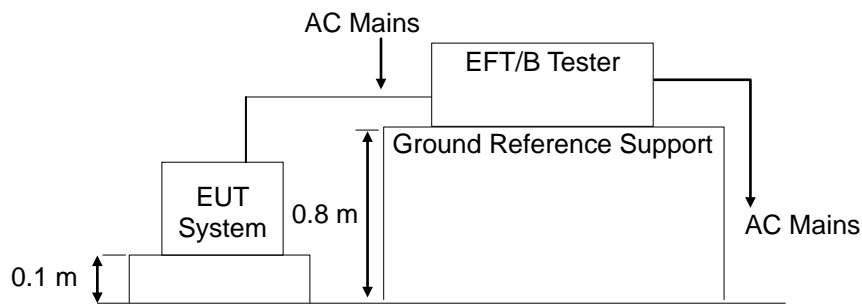
11.1. Block Diagram of Test Setup

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 0.1m 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>UPS-PM25C</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 Coupling Clamp:IP-4A	

12. SURGE IMMUNITY TEST

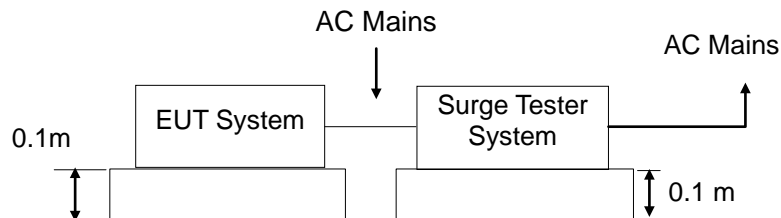
12.1. Block Diagram of Test Setup

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 : UPS-PM25C

Temperature : 23 °C

Power Supply : AC 380V / 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

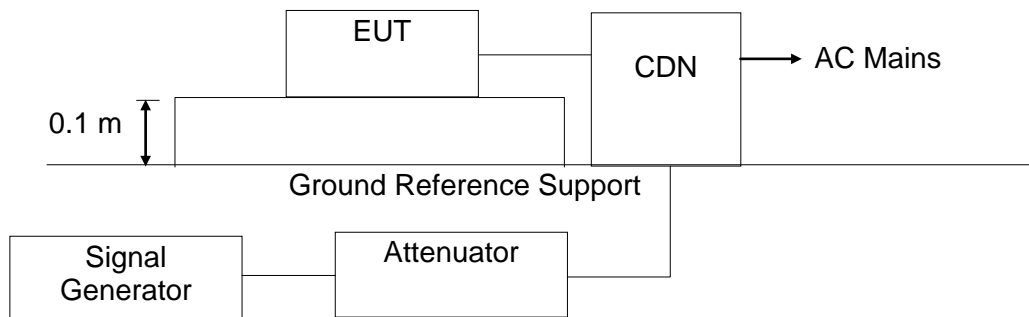
13.1. Block Diagram of Test Setup

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 2: 3V (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 to 80MHz 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 1.5×10^{-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

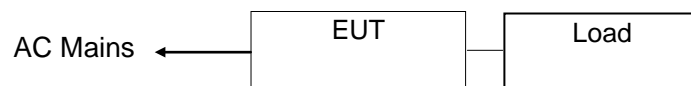
EMTEK (SHENZHEN) CO., LTD.

<p>Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u></p> <p>EUT : <u>Uninterruptible Power Systems</u></p> <p>M/N : <u>PM25C</u></p> <p>Power Supply : <u>AC 380V/50Hz</u></p> <p>Test Engineer : <u>ZZY</u></p>	<p>Test Date : <u>August 25, 2017</u></p> <p>Temperature : <u>23°C</u></p> <p>Humidity : <u>50%</u></p> <p>Actual Criterion : <u>A</u></p>			
<p>Test Mode : Line Mode</p>				
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Input	3V	A	A
0.15 ~ 80	AC Output	3V	A	A
<p>Remark : 1. Modulation Signal:1KHz 80% AM Measurement Equipment : Simulator: CWS 500C (SWITZERLAND EMTEST) CDN : <input type="checkbox"/> CDN-M432 (TESEQ) <input checked="" type="checkbox"/> CDN-M532 (TESEQ) <input type="checkbox"/> CDN-M332 (TESEQ) <input type="checkbox"/> Injection Clamp (EMTEST F-2031-23MM)</p>			<p>Note: /</p>	

14. MAGNETIC FIELD SUSCEPTIBILITY TEST

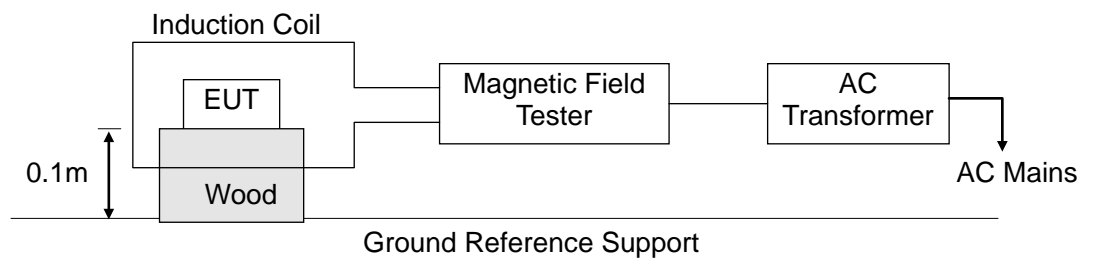
14.1. Block Diagram of Test

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 0.1m (high) table, this small table is also placed on a larger table, 0.1 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	
<p>Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u></p> <p>EUT : <u>Uninterruptible Power Systems</u> M/N : <u>PM25C</u></p> <p>Input Voltage : <u>AC 380V/50Hz</u></p> <p>Date of Test : <u>August 25, 2017</u> Test Engineer : <u>ZZY</u></p> <p>Ambient Condition : Temp : <u>22 °C</u> Humid : <u>50%</u></p> <p>Actual Criterion : A</p>				
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			
Note: /				

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

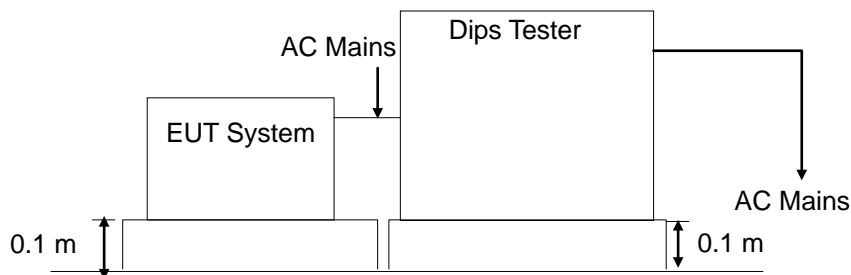
15.1. Block Diagram of Test Setup

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

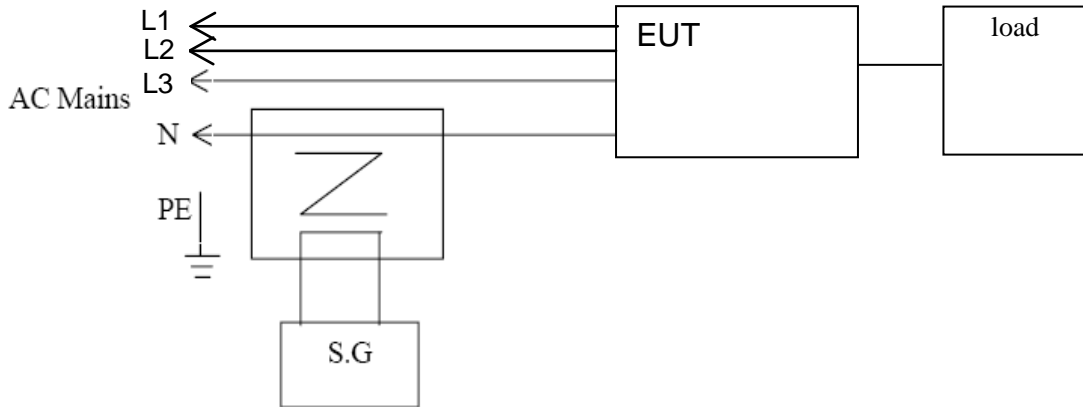
EMTEK (SHENZHEN) CO., LTD.

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</u> °C		
M/N : <u>PM25C</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

15.1.1 Block Diagram of the EUT



(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.

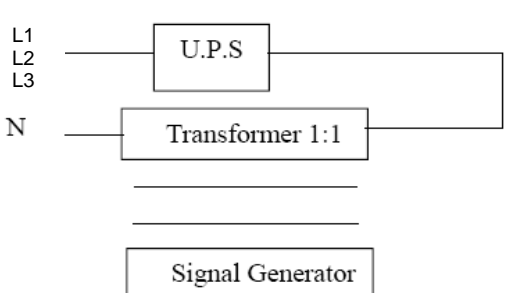
16.4. Test Results

PASS.

Please refer to following page.

Low Frequency Signals Test Result

EMTEK (SHENZHEN) CO., LTD.

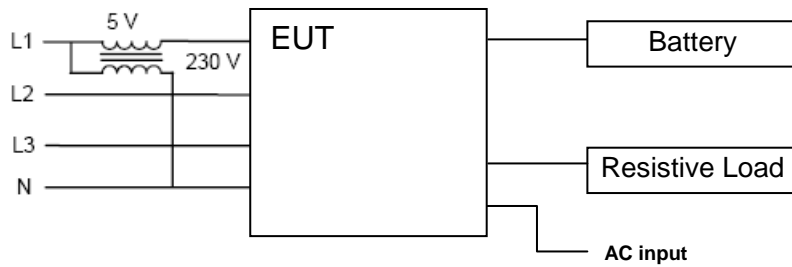
Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD</u> EUT : <u>Uninterruptible Power Systems</u> M/N : <u>PM25C</u> Power Supply : <u>AC 380V/50Hz</u> Test Engineer : <u>ZZY</u>			Test Date : <u>August 25, 2017</u> Temperature : <u>21°C</u> Humidity : <u>50%</u> Test Mode : <u>Line Mode</u> Actual 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)

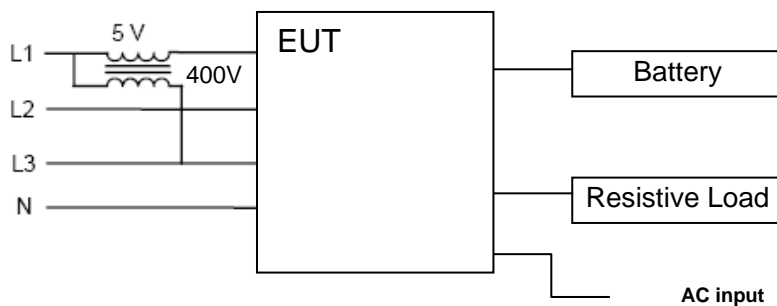
17.1. Block Diagram of Test Setup

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 17.1.

17.4. Test Results

PASS.

Please refer to following page.

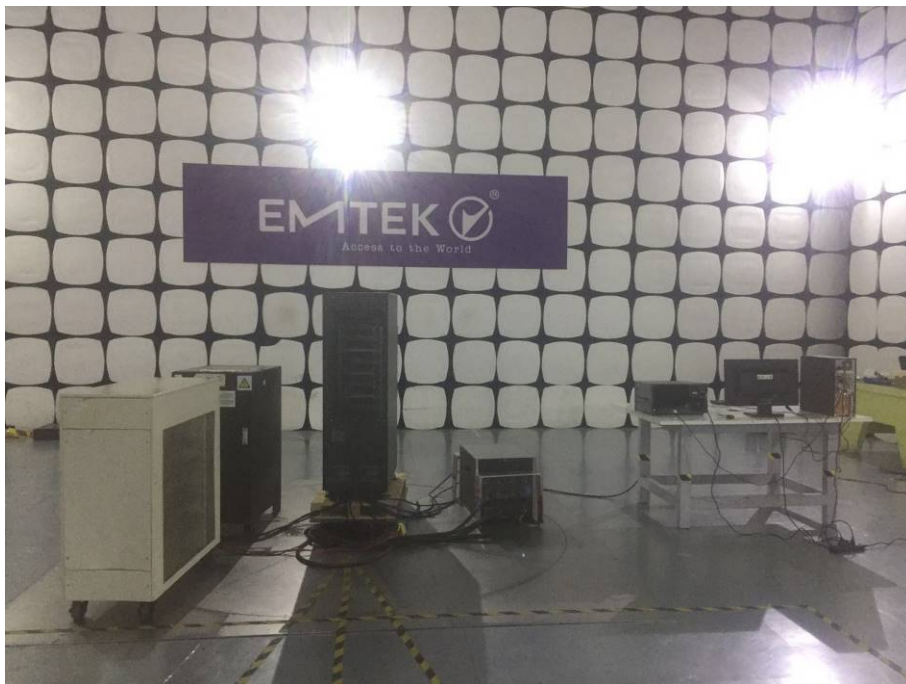
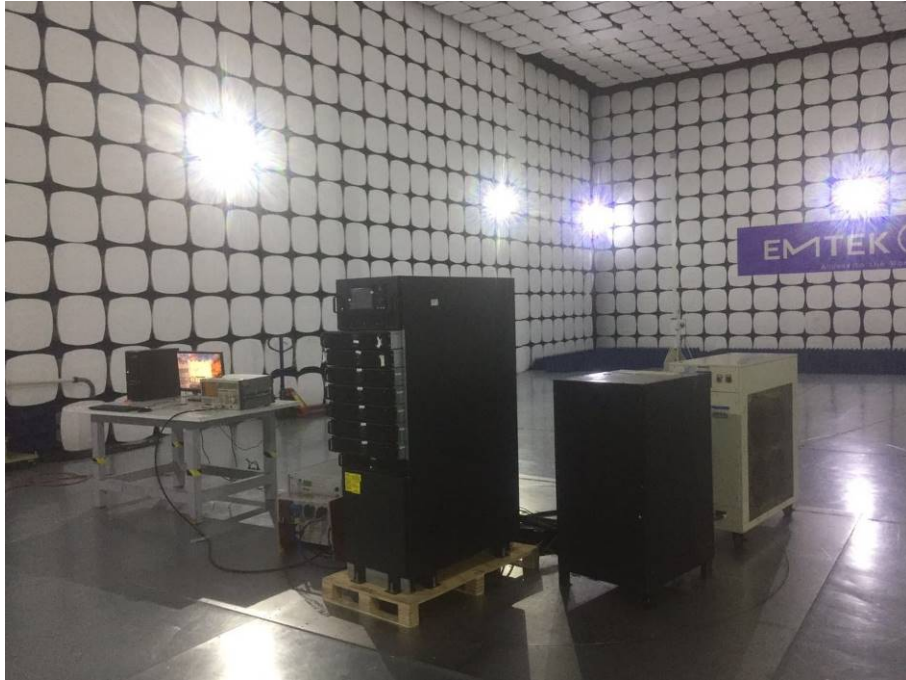
Power Line Unbalance Test Result

EMTEK (SHENZHEN) CO., LTD.

Applicant : <u>INVT POWER SYSTEM(SHENZHEN) CO., LTD.</u> EUT : <u>Uninterruptible Power Systems</u> M/N : <u>UPS-PM25C</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 16.1.1	5V(rms) Sinusoidal	A	N/A
Note: This result for normal. See 17.1.1			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



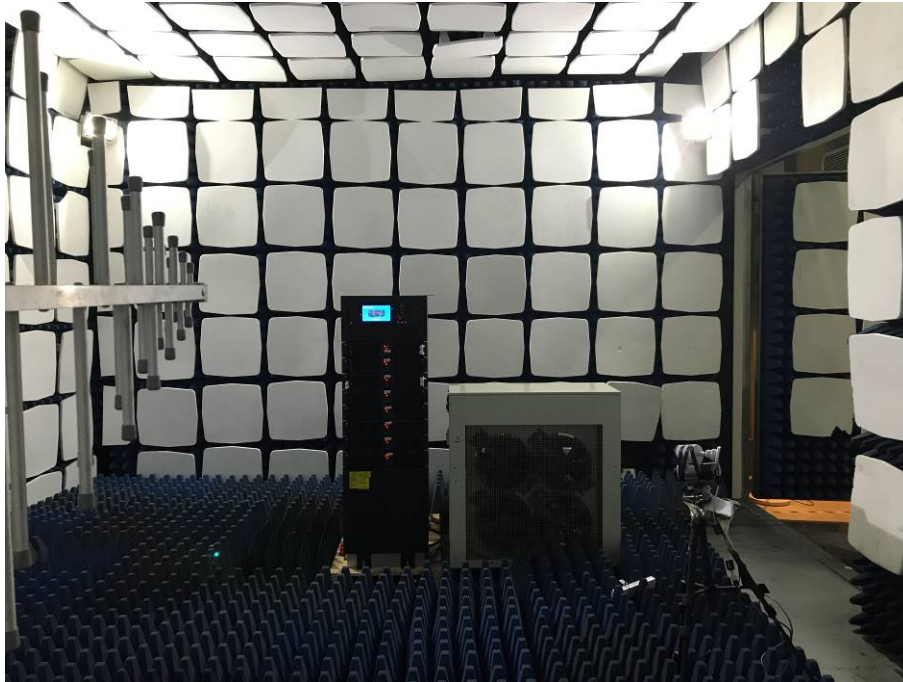
18.3.Photo of Harmonic / Flicker Measurement



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



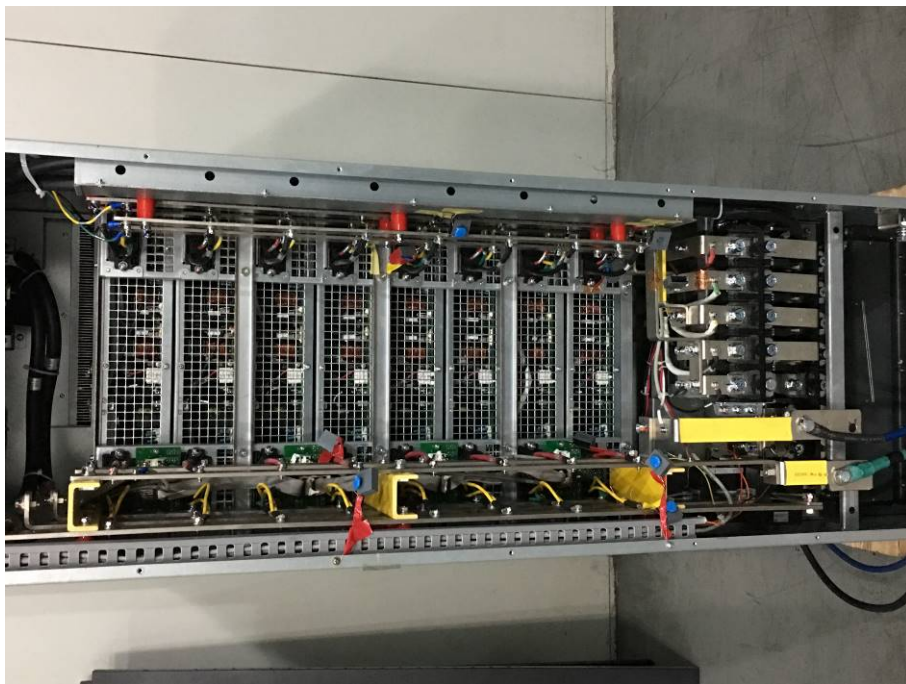
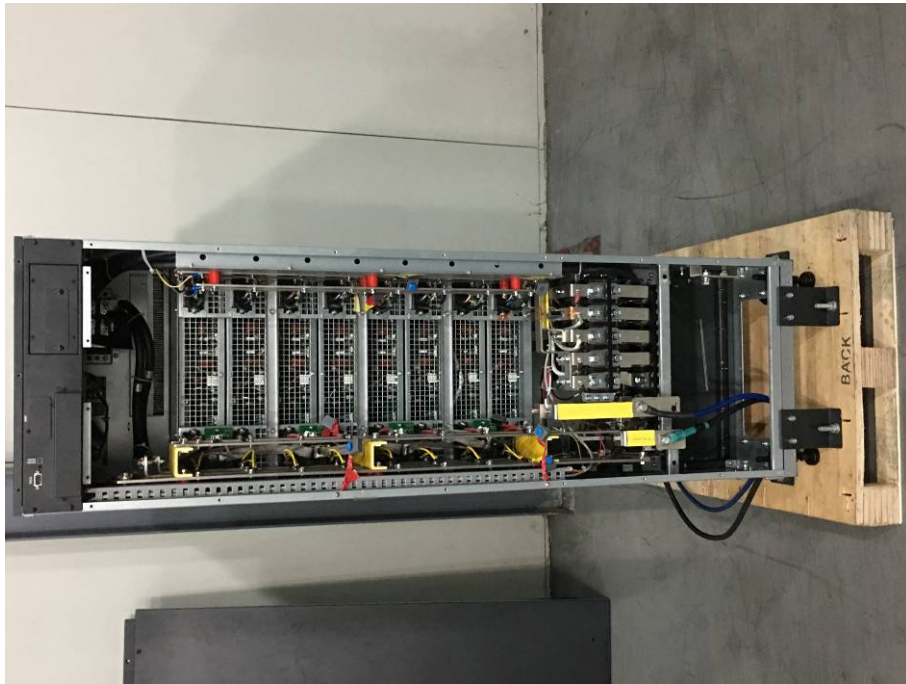
18.11.Photo of Low Frequency Signals Test and Power Line Unbalance Test

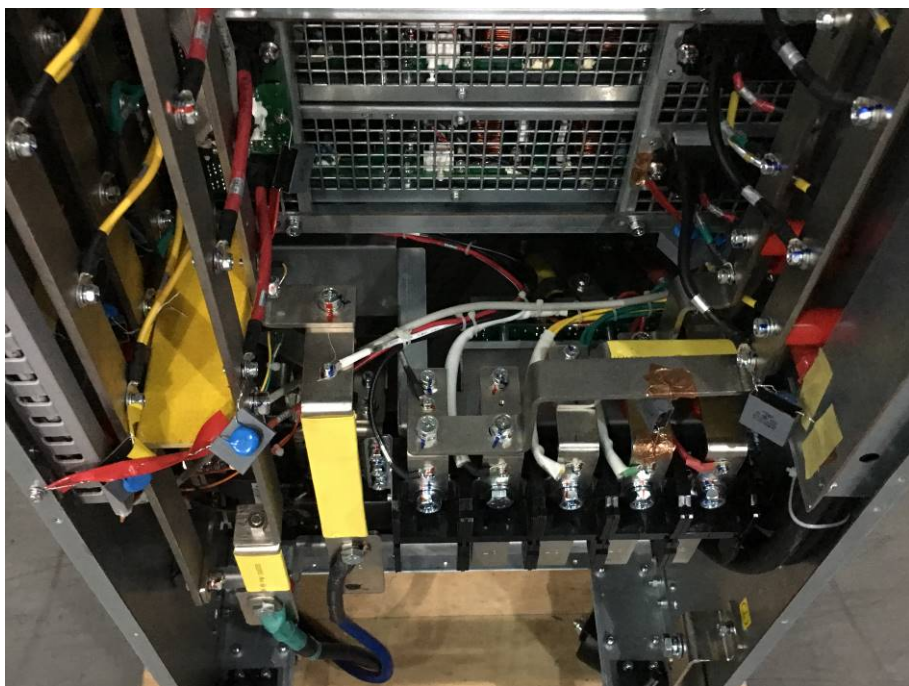
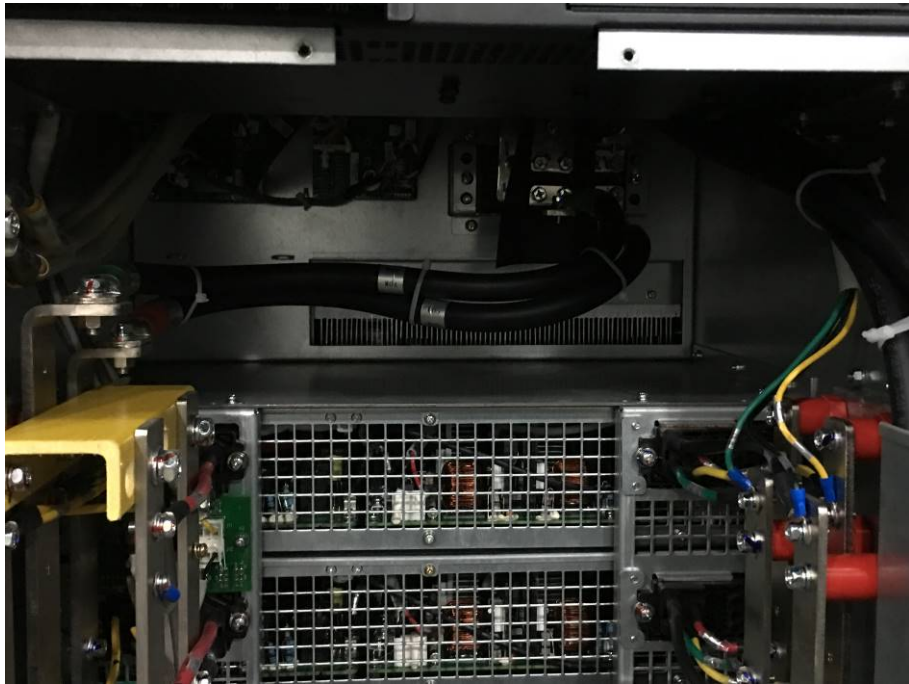


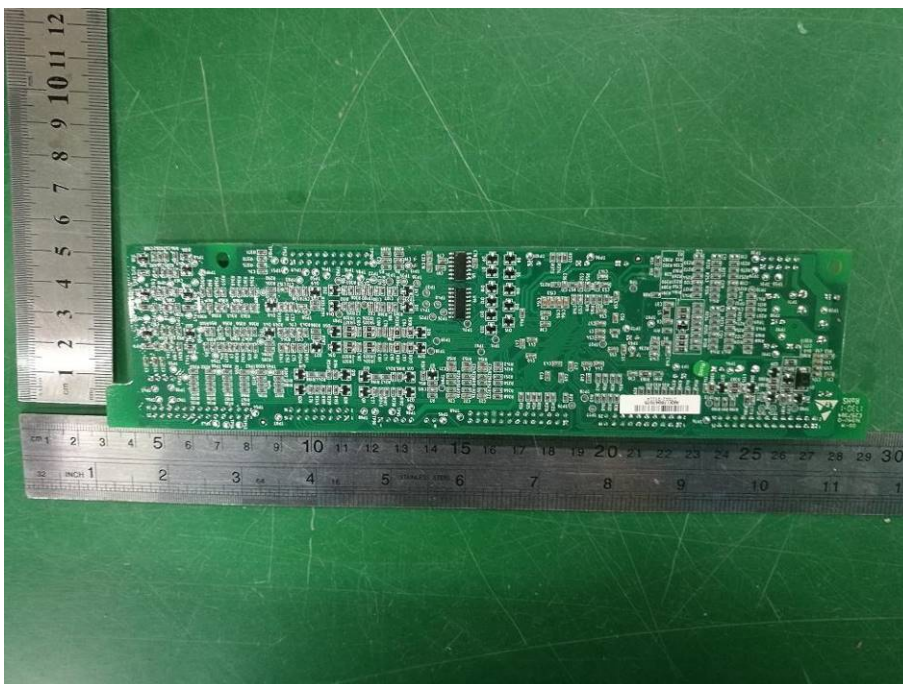
APPENDIX (Photos of EUT)

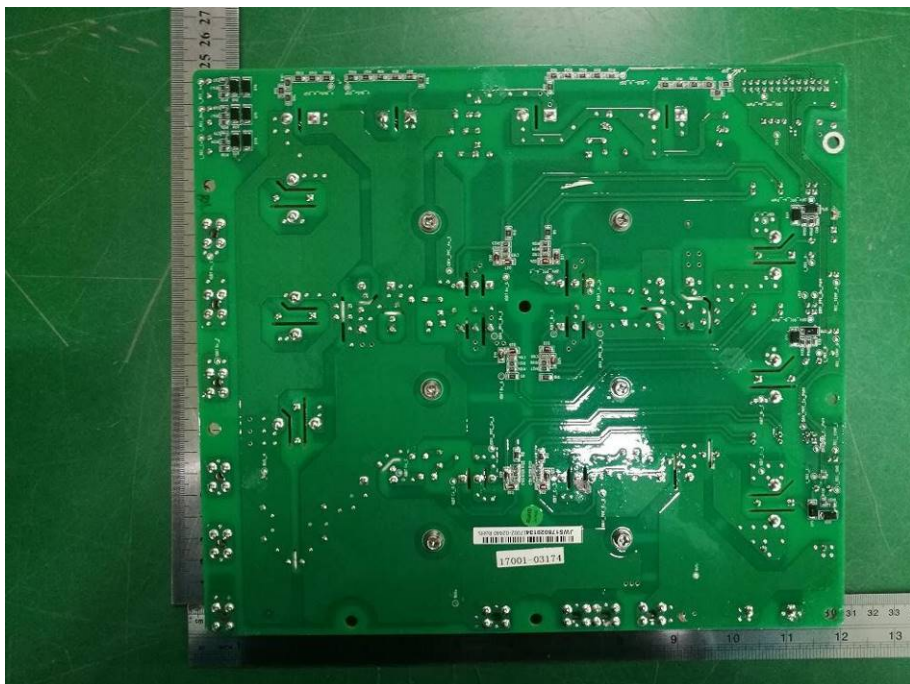
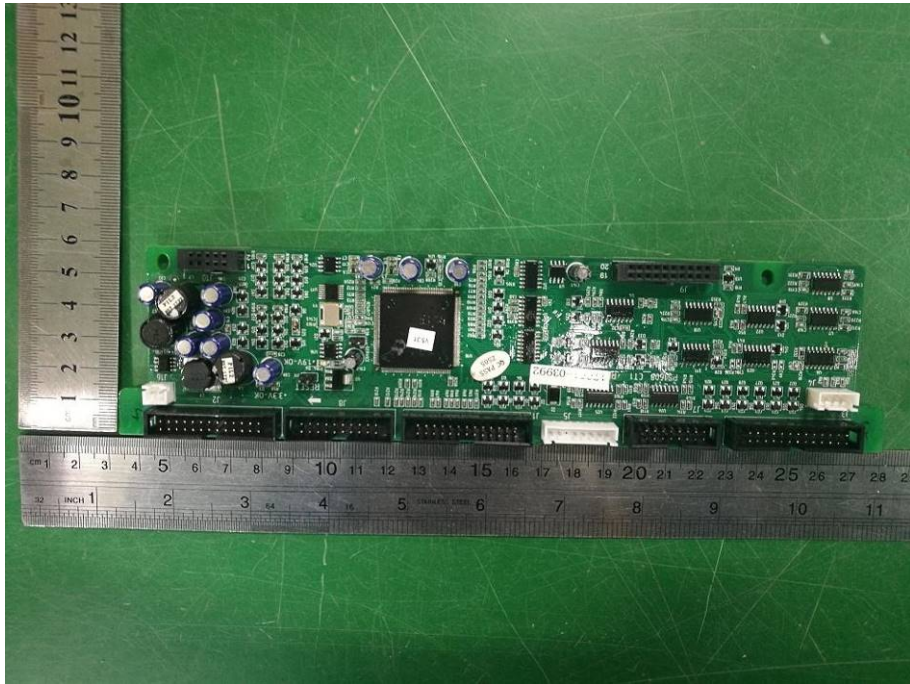


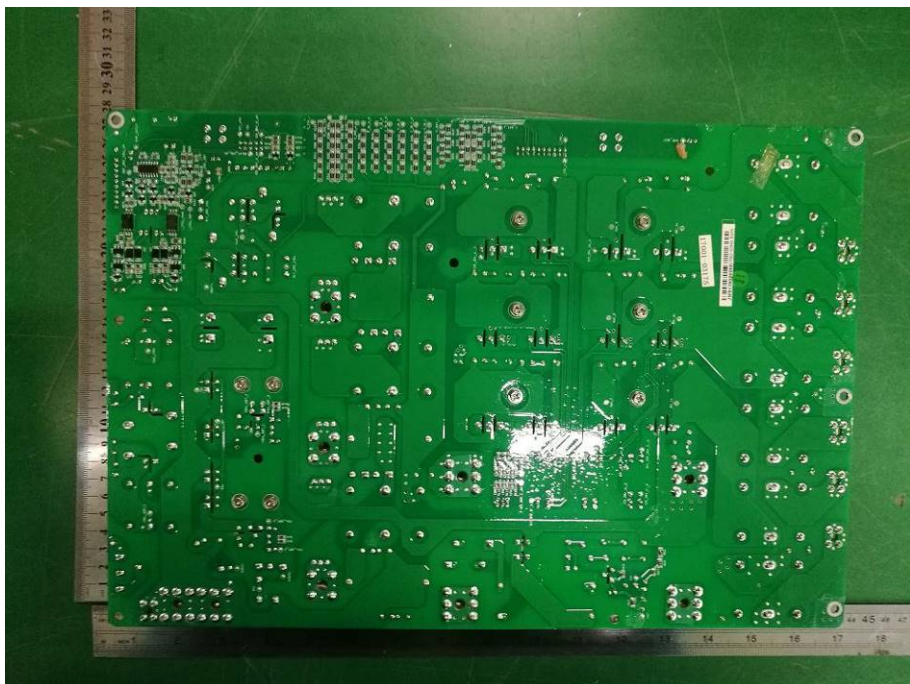
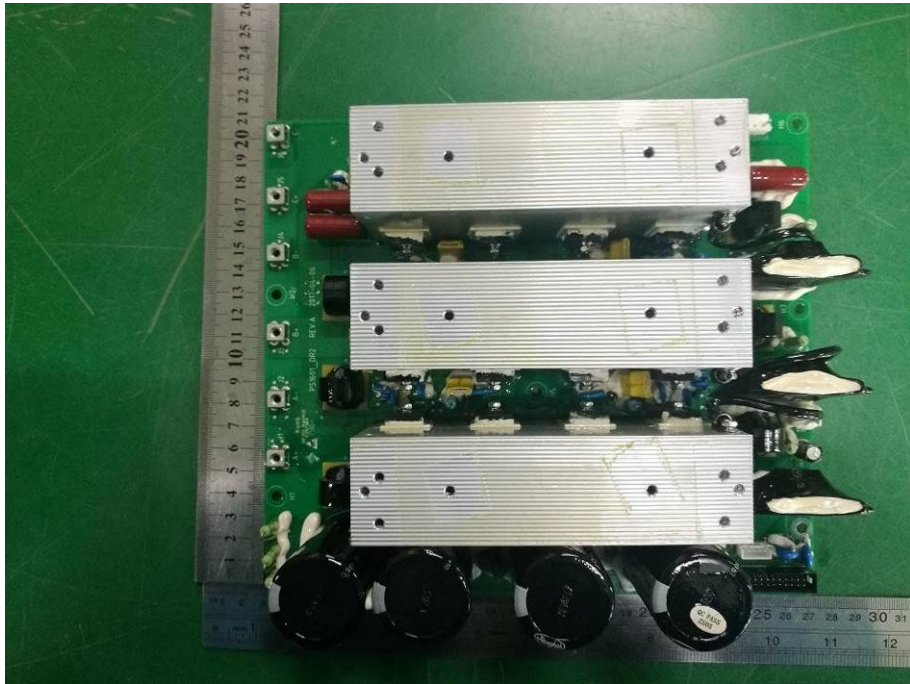


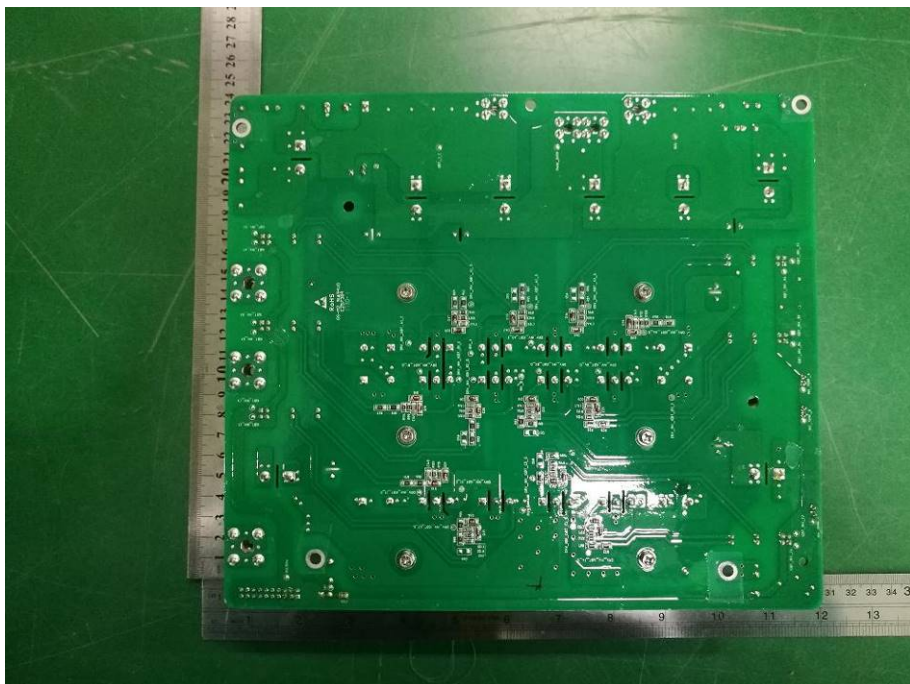
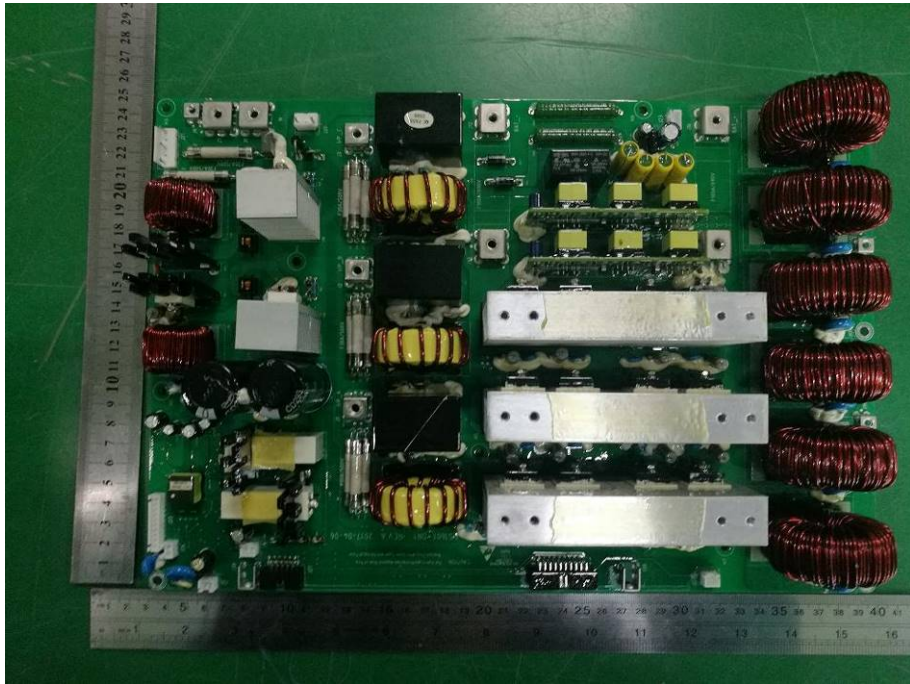


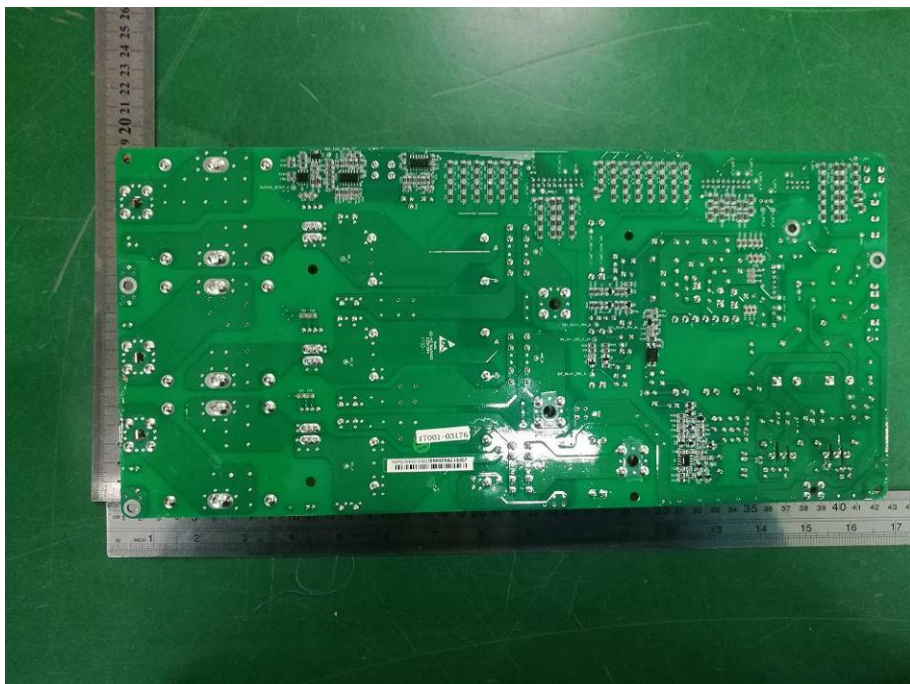
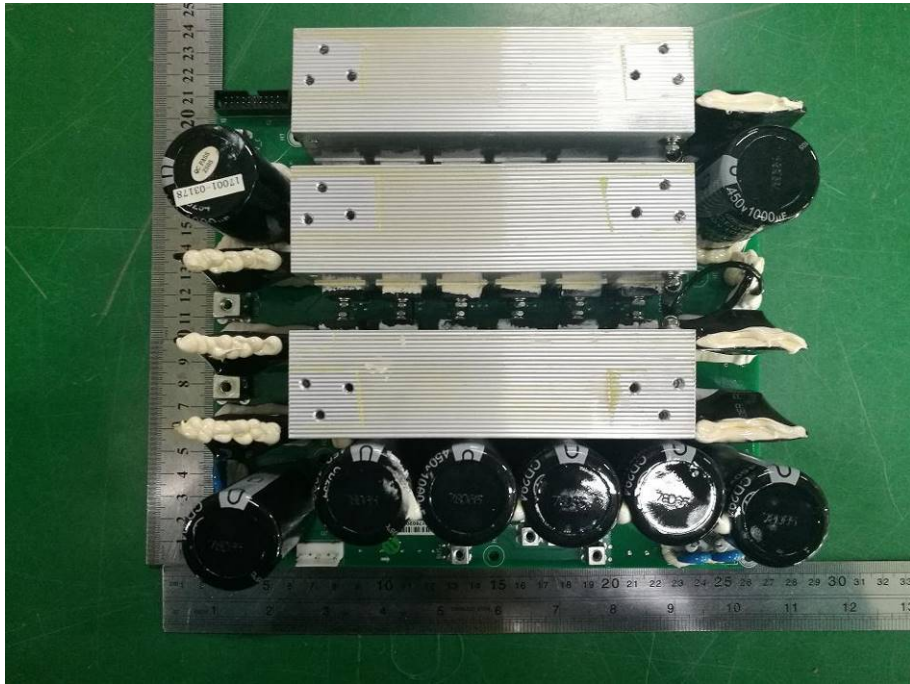


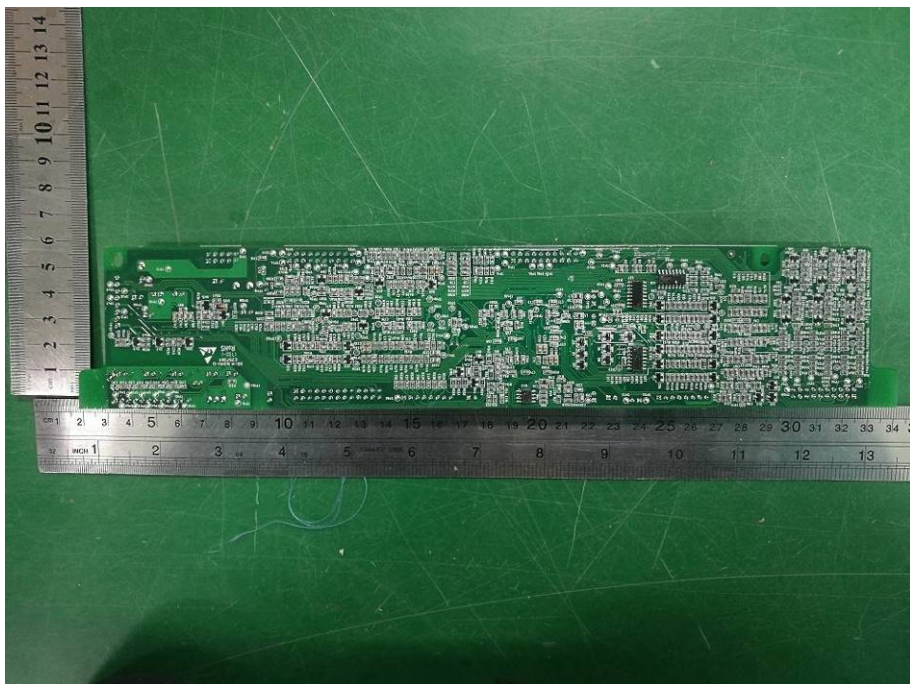
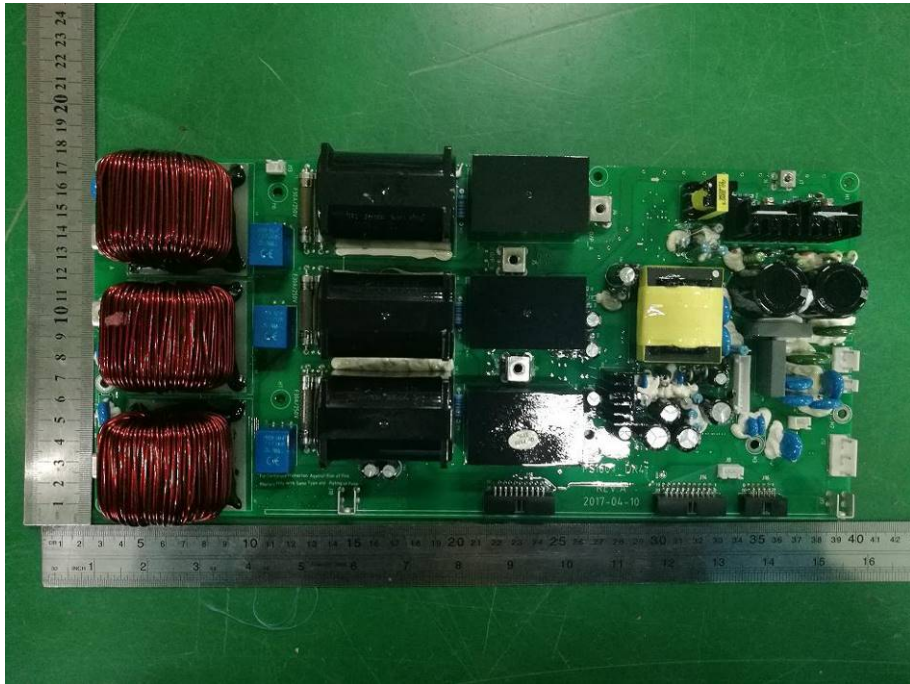


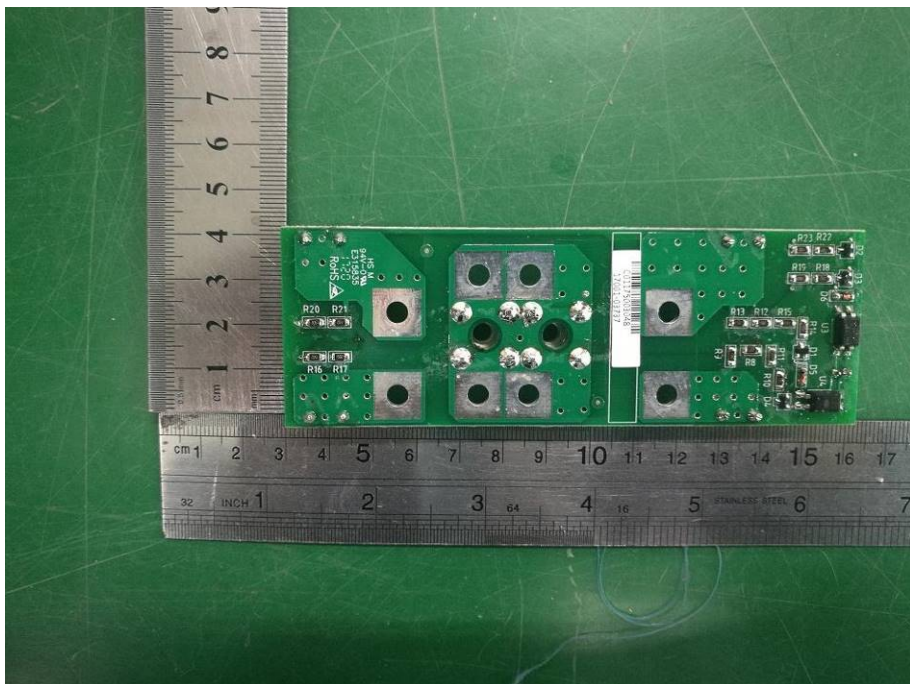
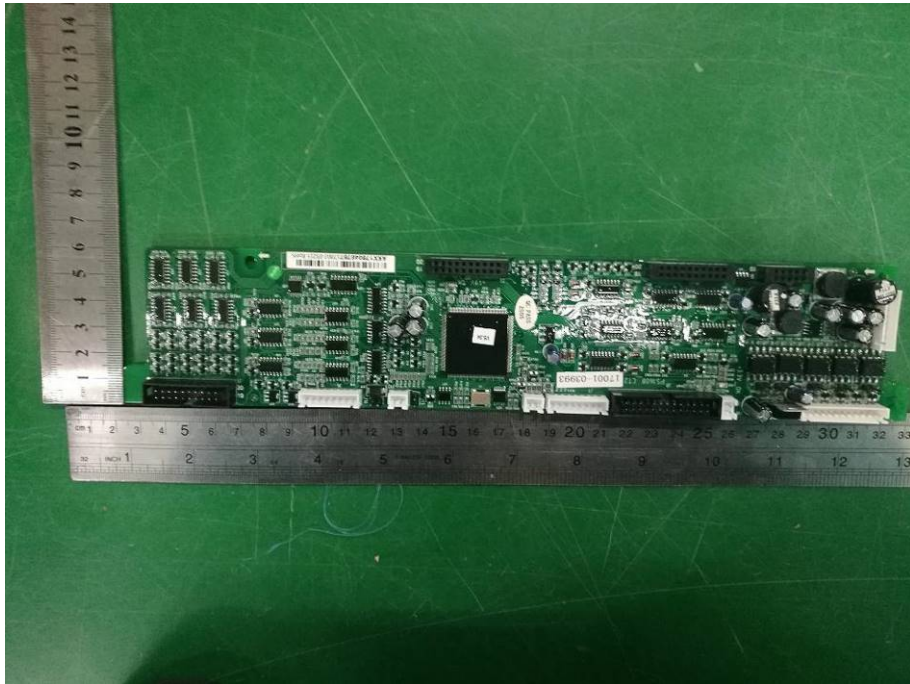


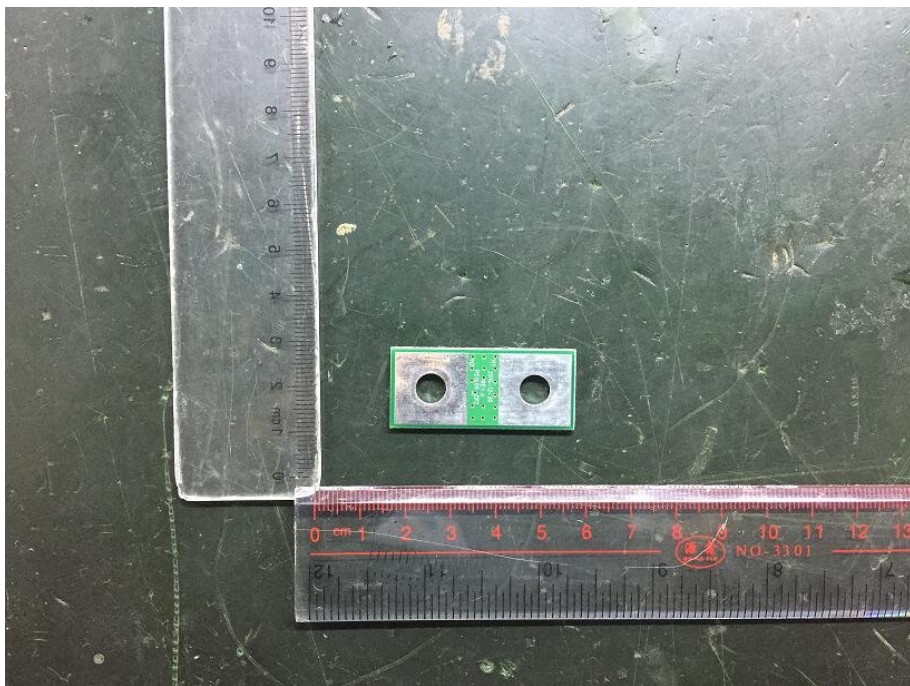
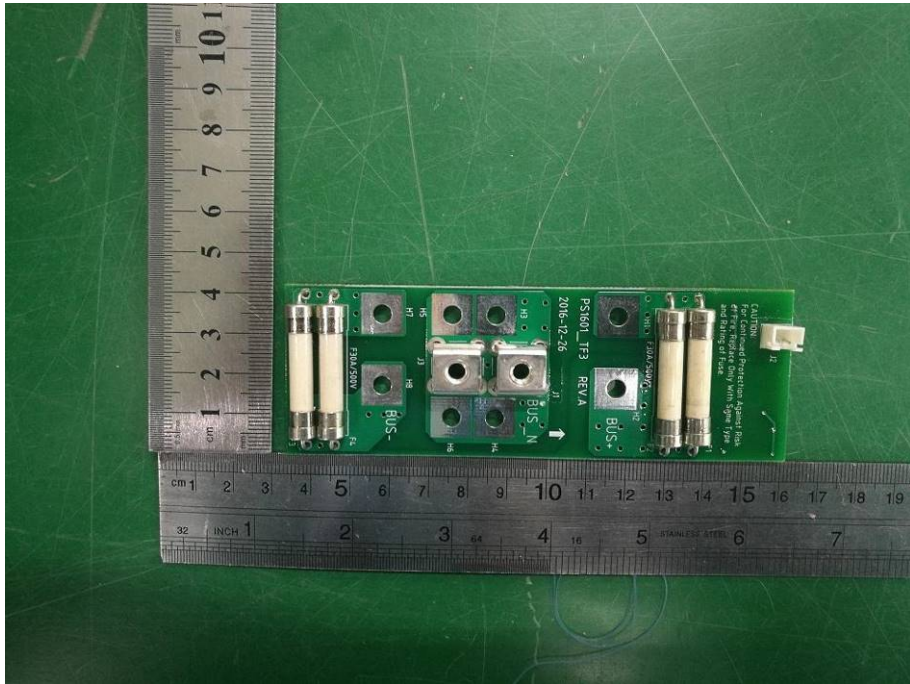


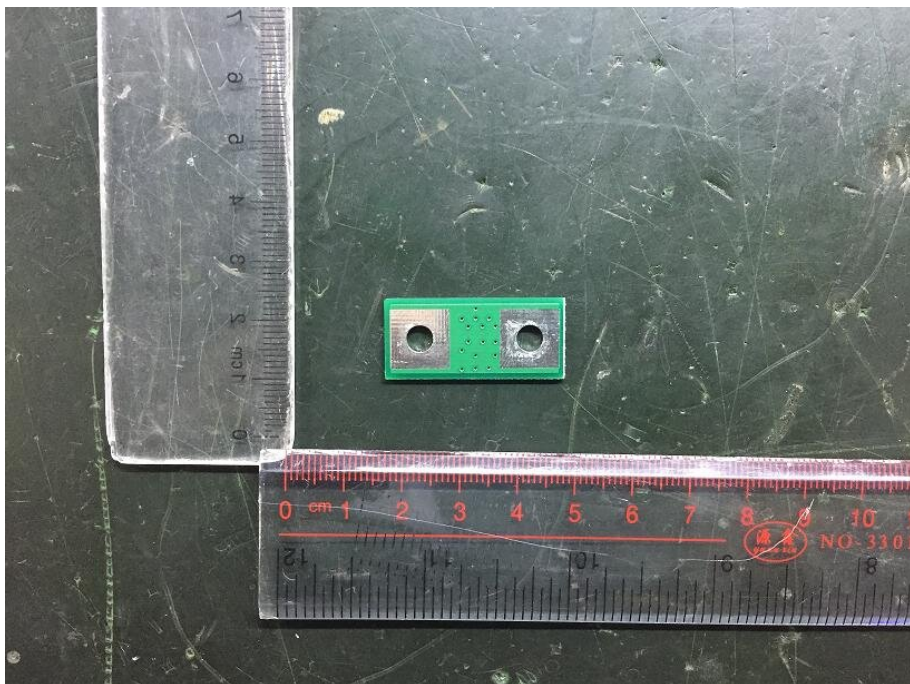
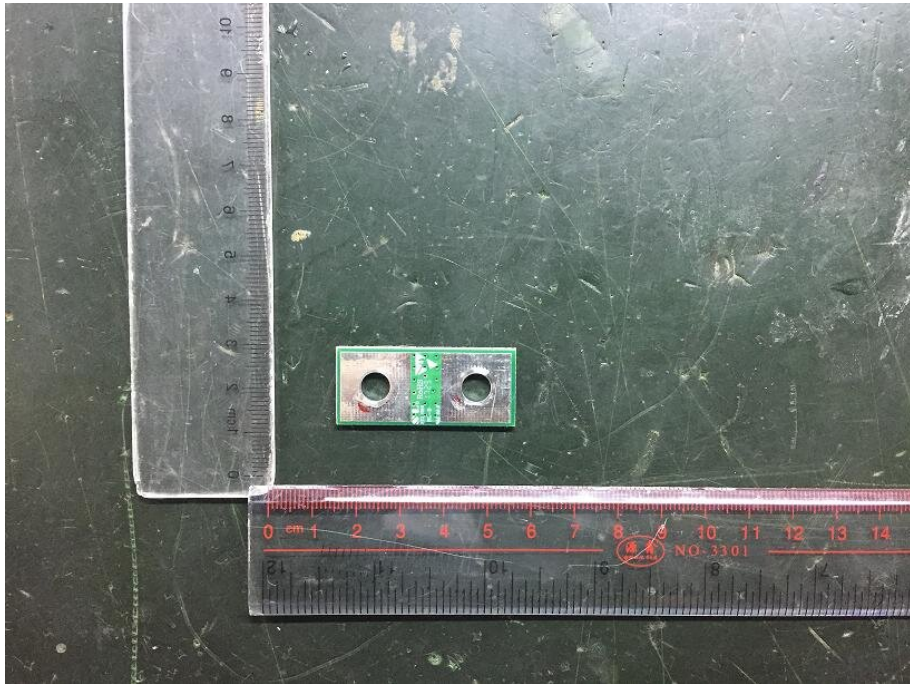


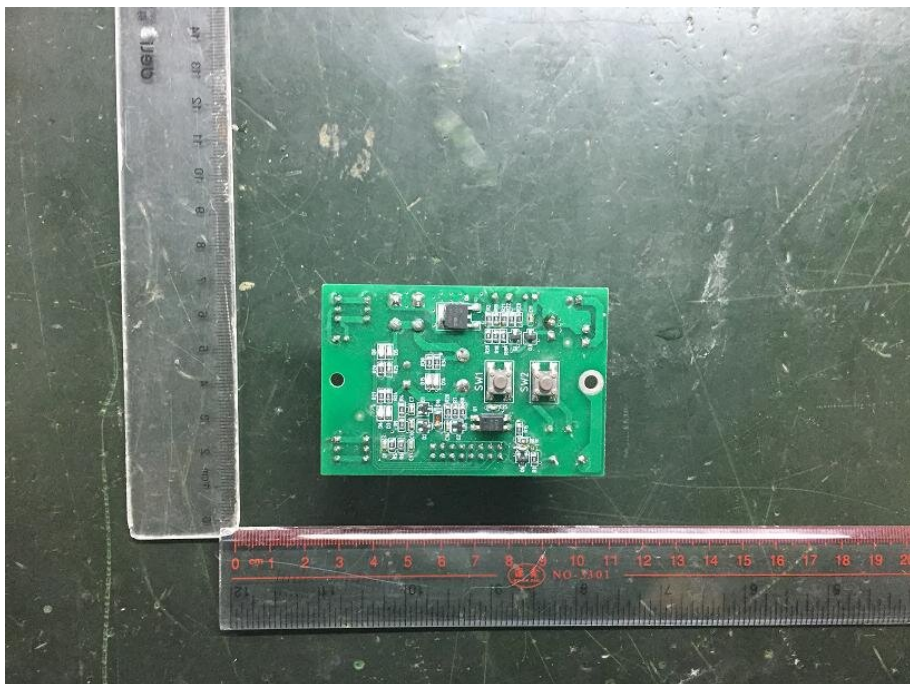
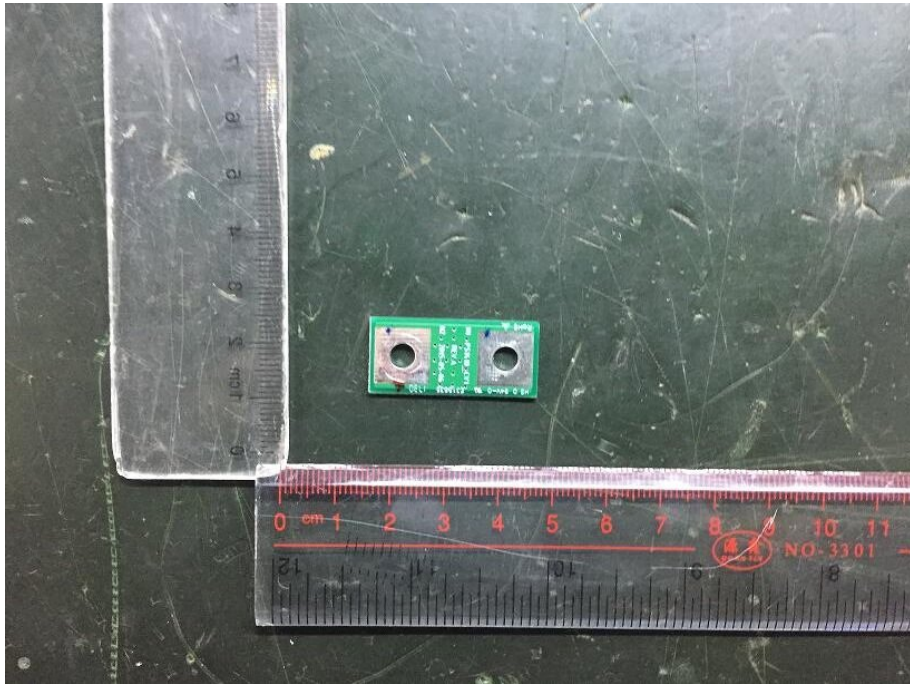


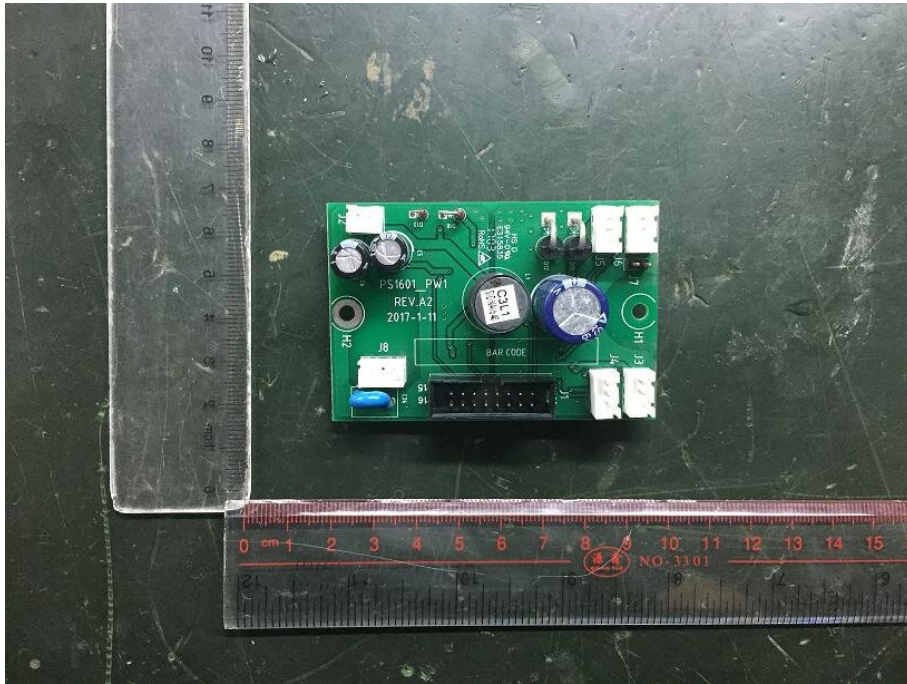












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