

EMC TEST REPORT
For

INVT Power System (Shenzhen) Co., Ltd

Uninterruptible Power System

**Model Number: HT33040XL, HT33040XS, HT33030XL, HT33030XS,
HT33020XL, HT33020XS**

Prepared for : Invt Power System (Shenzhen) Co., Ltd
Address : 5th Floor,1#Building,Gaofa Industrial Park, Longjing,

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Report Number : ES160523065E
Date of Test : April 24, 2015 to June 29, 2015
Date of Report : May 24, 2016

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TEST REPORT DESCRIPTION

Applicant : INVT Power System (Shenzhen) Co., Ltd
Manufacturer : INVT Power System (Shenzhen) Co., Ltd.
Trademark : INVT
EUT : Uninterruptible Power System
Model Number : HT33040XL, HT33040XS, HT33030XL, HT33030XS, HT33020XL,
HT33020XS
Power Supply : Please refer to the page 8

Measurement Procedure Used:

EN 62040-2:2006
(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,
EN 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.

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 : April 24 , 2015 to June 29, 2015

Prepared by : Bunny Zhang
Bunny Zhang/Editor

Reviewer : Jessie Hu
Jessie Hu/Supervisor

Approved & Authorized Signer : Lisa Wang
Lisa Wang/Manager

Modified Information

Version	Report No.	Revision Date	Summary
V1.0	ES150423307E	/	Original Report
V1.0	ES160523065E	May 24, 2016	Update EMC directive and Standards

Note: Standard updated is no impact on EMC compliance.

1. SUMMARY OF TEST RESULT

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted Disturbance at Mains Terminals	EN 62040-2:2006	C3	Pass
Radiated Disturbance	EN 62040-2:2006	C3	Pass
Harmonic Current Emissions	EN 62040-2:2006	N/A	N/A
Voltage Fluctuation and Flicker	EN 62040-2:2006	N/A	N/A
IMMUNITY (C3)			
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, >95% Reduction	IEC 61000-4-11:2004	A	Pass
Voltage Dips, 30% Reduction			
Voltage Interruptions			
Low Frequency Signals	EN 61000-2-2:2002	A	Pass
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	: Uninterruptible Power System
Model Number	: HT33040XL, HT33040XS, HT33030XL, HT33030XS, HT33020XL, HT33020XS (Note: All models have the same constructions, circuit diagram and PCB layout except their Model NO., appearance and rating. We prepare HT33040XL for EMS test.)
Input Rating	: HT33020XS: AC Input : 380/400/415VAC, 3 ϕ +N+PE, 50Hz/60Hz, 29Amax, Batt Input: \pm 240Vdc, 40Amax HT33020XL: AC Input : 380/400/415VAC, 3 ϕ +N+PE, 50Hz/60Hz, 29Amax, Batt Input: \pm 240Vdc, 40Amax HT33030XS: AC Input : 380/400/415VAC, 3 ϕ +N+PE, 50Hz/60Hz, 44Amax, Batt Input: \pm 240Vdc, 60Amax HT33030XL: AC Input : 380/400/415VAC, 3 ϕ +N+PE, 50Hz/60Hz, 44Amax, Batt Input: \pm 240Vdc, 60Amax HT33040XS: AC Input : 380/400/415VAC, 3 ϕ +N+PE, 50Hz/60Hz, 58Amax, Batt Input: \pm 240Vdc, 80Amax HT33040XL: AC Input : 380/400/415VAC, 3 ϕ +N+PE, 50Hz/60Hz, 58Amax, Batt Input: \pm 240Vdc, 80Amax

Output Rating : HT33020XS:
380/400/415VAC,
3 ϕ +N+PE, 50Hz/60Hz, 20kVA/18Kw

HT33020XL:
380/400/415VAC,
3 ϕ +N+PE, 50Hz/60Hz, 20kVA/18kW

HT33030XS:
380/400/415VAC,
3 ϕ +N+PE, 50Hz/60Hz, 30kVA/27kW

HT33030XL:
380/400/415VAC,
3 ϕ +N+PE, 50Hz/60Hz, 30kVA/27kW

HT33040XS:
380/400/415VAC,
3 ϕ +N+PE, 50Hz/60Hz, 40kVA/36kW

HT33040XL:
380/400/415VAC,
3 ϕ +N+PE, 50Hz/60Hz, 40kVA/36Kw

Test Voltage : AC 380V/50Hz

Applicant : INVT Power System (Shenzhen) Co., Ltd

Address : 5th Floor,1#Building,Gaofa Industrial Park, Longjing, Nanshan District,
Shenzhen, China, 518055

Manufacturer : INVT Power System (Shenzhen) Co., Ltd.

Address : 5th Floor, 1# Building, Gaofa Industrial Park, Longjing, Nanshan District,
Shenzhen, China, 518055

Date of Received : April 24 , 2015

Date of Test : April 24 , 2015 to June 29, 2015

2.2. Description of Support Device

N/A

2.3. Description of Test Facility

Site Description

EMC Lab.

: Accredited by CNAS, 2013.10.29

The certificate is valid until 2016.10.28

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)

The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2010.5.25

The Laboratory has been assessed according to the requirements ISO/IEC 17025.

Accredited by FCC, April 17, 2013

The Certificate Registration Number is 709623.

Accredited by Industry Canada, November 15, 2010

The Certificate Registration Number is 46405-4480.

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 (3m Chamber)	: 3.3dB (30M~1GHz Polarize: H) 3.2dB (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 Power Line Conducted Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	L.I.S.N.	ROHDE & SCHWARZ	ESH3-Z6	100011	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	L.I.S.N.	ROHDE & SCHWARZ	ESH3-Z6	100253	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	50Ω Coaxial Switch	Anritsu	MP59B	M20531	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	L.I.S.N.	ROHDE & SCHWARZ	ESH3-Z6	100011	May 17, 2014	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	ESU	1302.6005.26	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Pre-Amplifier	HP	8447D	2944A07999	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Bilog Antenna	Schwarzbeck	VULB9163	142	May 17, 2014	1 Year
<input type="checkbox"/>	Loop Antenna	Schwarzbeck	FMZB 1519	012	May 17, 2014	1 Year
<input type="checkbox"/>	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 17, 2014	1 Year
<input type="checkbox"/>	Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Schwarzbeck	AK9513	ACRX1	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Rosenberger	N/A	FP2RX2	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Schwarzbeck	AK9513	CRPX1	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Cable	Schwarzbeck	AK9513	CRRX2	May 17, 2014	1 Year
<input type="checkbox"/>	Pre-Amplifier	A.H.	PAM-0126	1415261	May 17, 2014	1 Year

3.3. For Harmonic Current & Flick Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	AC Power source	California Instruments	5001iX-CTS-400-413	59739	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Harmonic flicker test system	California Instruments	PACS-1	72795	May 17, 2014	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 17, 2014	1 Year
<input checked="" type="checkbox"/>	Impulse Module	TESEQ AG	INA 4380-150pF/330Ohm	403-550/1712	May 17, 2014	1 Year

3.5. For RF Strength Susceptibility Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 17, 2014	1 Year
<input type="checkbox"/>	Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120 L3F	332	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Power Amplifier	PRANA	AP32MT215	N/A	May 17, 2014	1 Year
<input type="checkbox"/>	Power Amplifier	MILMEGA	AS0102-55	N/A	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Signal Generator	AEROFLEX	2023B	N/A	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Field Strength Meter	HOLADAY	HI-6005	N/A	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	RS232 Fiber Optic Modem	HOLADAY	HI-4413P	N/A	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May 17, 2014	1 Year

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 17, 2014	1 Year
<input type="checkbox"/>	Coupling Clamp	HAEFELY	IP-4A	147147	May 17, 2014	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 17, 2014	1Year
<input checked="" type="checkbox"/>	Impulse Module	HAEFELY	PIM 100	174124	May 17, 2014	1Year
<input checked="" type="checkbox"/>	Coupling Decoupling Filter	HAEFELY	PCD 130	172181	May 17, 2014	1Year
<input type="checkbox"/>	Coupling Module	HAEFELY	PCD122	174354	May 17, 2014	1Year
<input type="checkbox"/>	Surge Impulse Module	HAEFELY	PIM 120	174435	May 17, 2014	1Year
<input type="checkbox"/>	Coupling Module	HAEFELY	PCD 126A	174387	May 17, 2014	1Year
<input type="checkbox"/>	Impulse Module	HAEFELY	PIM 110	174391	May 17, 2014	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 17, 2014	1 Year
<input type="checkbox"/>	CDN	EMTEST	CDN-M2	5100100100	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	CDN	EMTEST	CDN-M3	0900-11	May 17, 2014	1 Year
<input type="checkbox"/>	Injection Clamp	EMTEST	F-2031-23MM	368	May 17, 2014	1 Year
<input checked="" type="checkbox"/>	Attenuator	EMTEST	ATT6	0010222A	May 17, 2014	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 17, 2014	1 Year

3.10. For Voltage Dips and Interruptions Test

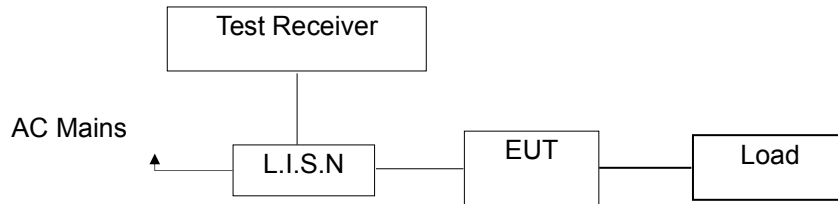
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Dips Tester	HAEFELY	Pline1610	083732-12	May 17, 2014	1 Year

3.11.Low Frequency Signals Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Programmable AC Source	CHROMA	6530	/	May 17, 2014	1 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



(EUT: Uninterruptible Power System)

4.2. Measuring Standard

EN 62040-2:2006 Category C3

Power Line Conducted Emission Limits:

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	100	90
0.50 ~ 5.00	86	76
5.00 ~ 30.00	90 to 70	80 to 60

4.3. EUT Configuration on 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 System (EUT)

Model Number : HT33040XL

Serial Number : N/A

4.4. Operating Condition of EUT

4.4.1. Setup the EUT as shown on Section 4.1.

4.4.2. Turn on the power of all equipments.

4.4.3. Let the EUT work in measuring mode (Line mode, Battery mode) and measure it.

4.5. Test Procedure

The EUT is put on the plane 0.1m high above 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 EN 62040-2 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.

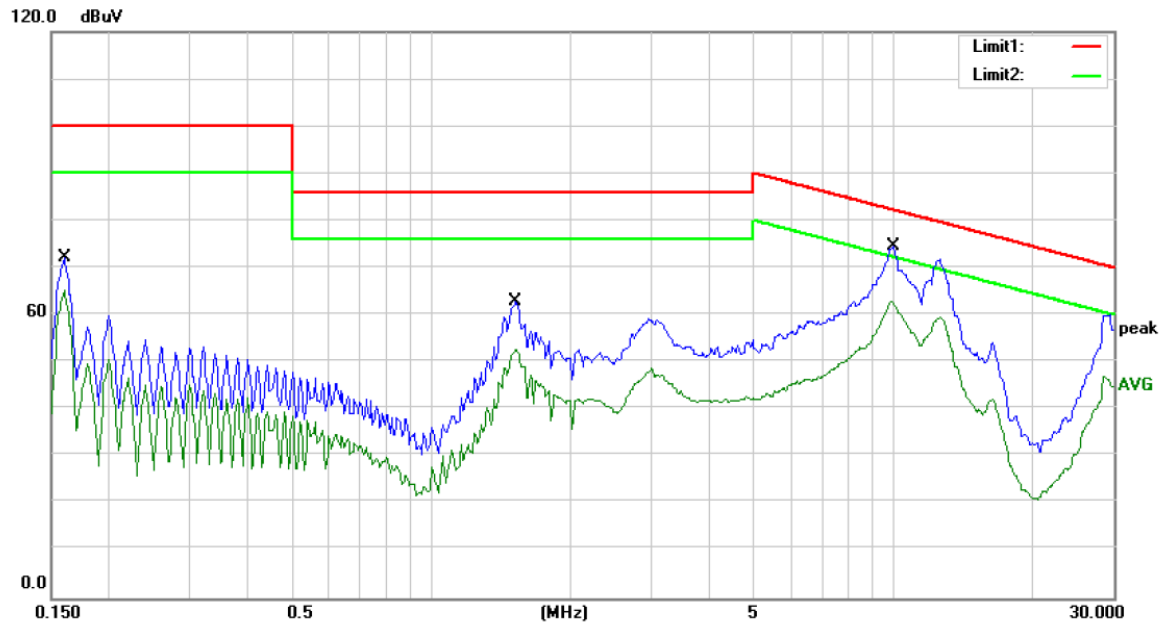
The frequency range from 150kHz to 30MHz is investigated.

All the scanning waveform is put in the following pages.

4.6. Measuring Results

PASS.

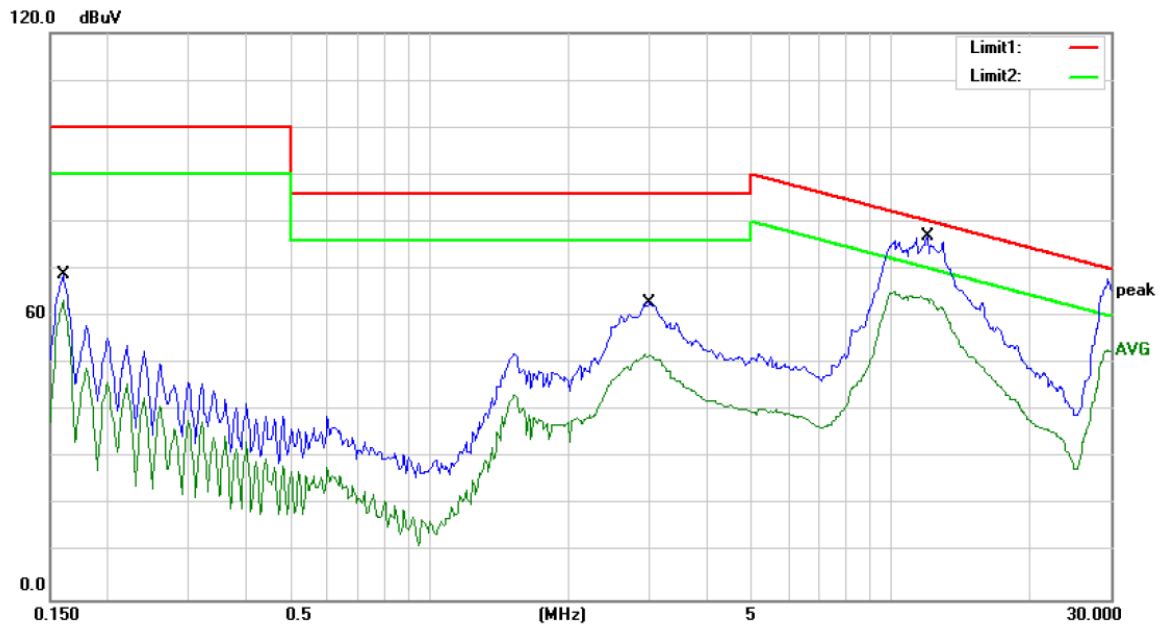
Please refer to the following pages.



Site Conduction #2 Phase: **L1** Temperature: 26
 Limit: (CE)EN62040-2 C3_QP Power: AC 380V/50Hz Humidity: 55 %
 Mode: FULL LOAD
 Note: LINE MODE

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1600	72.29	0.00	72.29	100.00	-27.71	QP	
2		0.1600	65.37	0.00	65.37	90.00	-24.63	AVG	
3		1.5250	62.91	0.00	62.91	86.00	-23.09	QP	
4		1.5250	52.72	0.00	52.72	76.00	-23.28	AVG	
5	*	10.0000	74.56	0.00	74.56	82.26	-7.70	QP	
6		10.0000	62.97	0.00	62.97	72.26	-9.29	AVG	

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



Site Conduction #2

Phase: **L2**

Temperature: 26

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

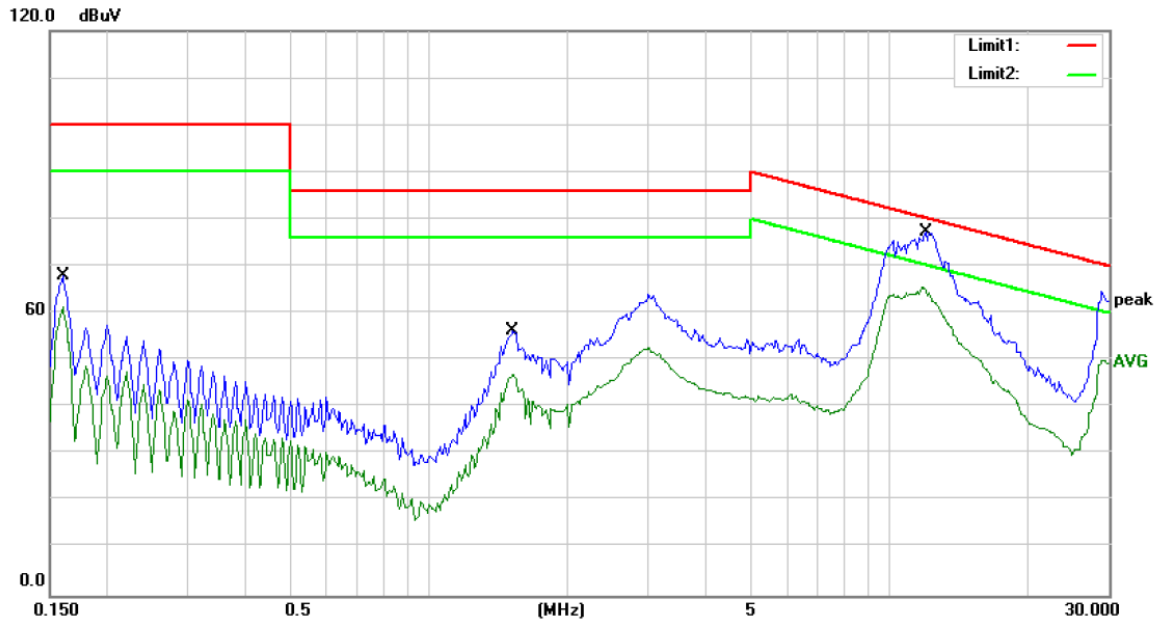
Humidity: 55 %

Mode: FULL LOAD

Note: LINE MODE

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1600	68.99	0.00	68.99	100.00	-31.01	QP	
2		0.1600	63.35	0.00	63.35	90.00	-26.65	AVG	
3		3.0000	62.84	0.00	62.84	86.00	-23.16	QP	
4		3.0000	52.11	0.00	52.11	76.00	-23.89	AVG	
5		12.0000	74.84	0.00	74.84	80.23	-5.39	QP	
6	*	12.0000	64.96	0.00	64.96	70.23	-5.27	AVG	

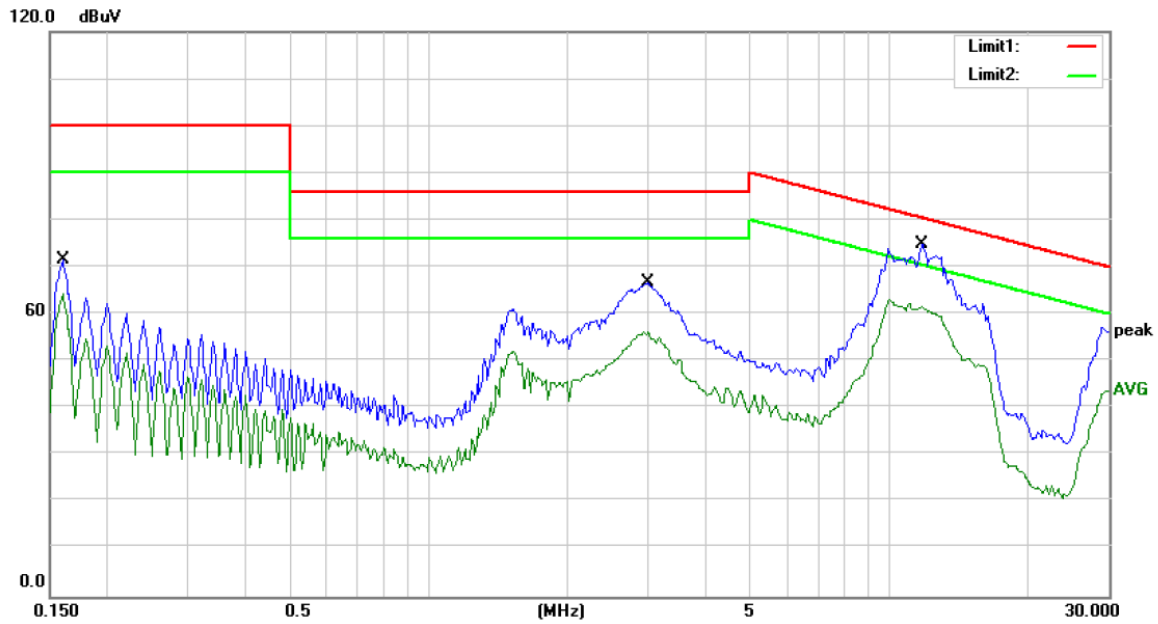
*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: HE



Site Conduction #2 Phase: **L3** Temperature: 26
 Limit: (CE)EN62040-2 C3_QP Power: AC 380V/50Hz Humidity: 55 %
 Mode: FULL LOAD
 Note: LINE MODE

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1600	67.95	0.00	67.95	100.00	-32.05	QP	
2		0.1600	61.48	0.00	61.48	90.00	-28.52	AVG	
3		1.5250	56.12	0.00	56.12	86.00	-29.88	QP	
4		1.5250	46.92	0.00	46.92	76.00	-29.08	AVG	
5		12.0000	74.38	0.00	74.38	80.23	-5.85	QP	
6	*	12.0000	65.46	0.00	65.46	70.23	-4.77	AVG	

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



Site Conduction #2

Phase: **N**

Temperature: 26

Limit: (CE)EN62040-2 C3_QP

Power: AC 380V/50Hz

Humidity: 55 %

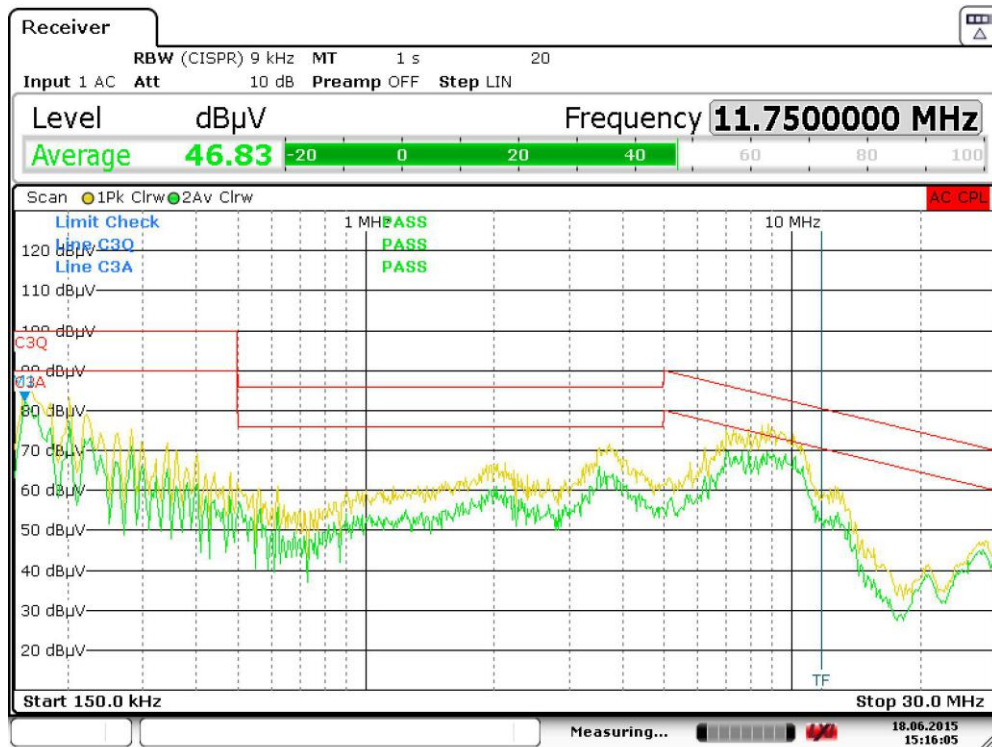
Mode: FULL LOAD

Note: LINE MODE

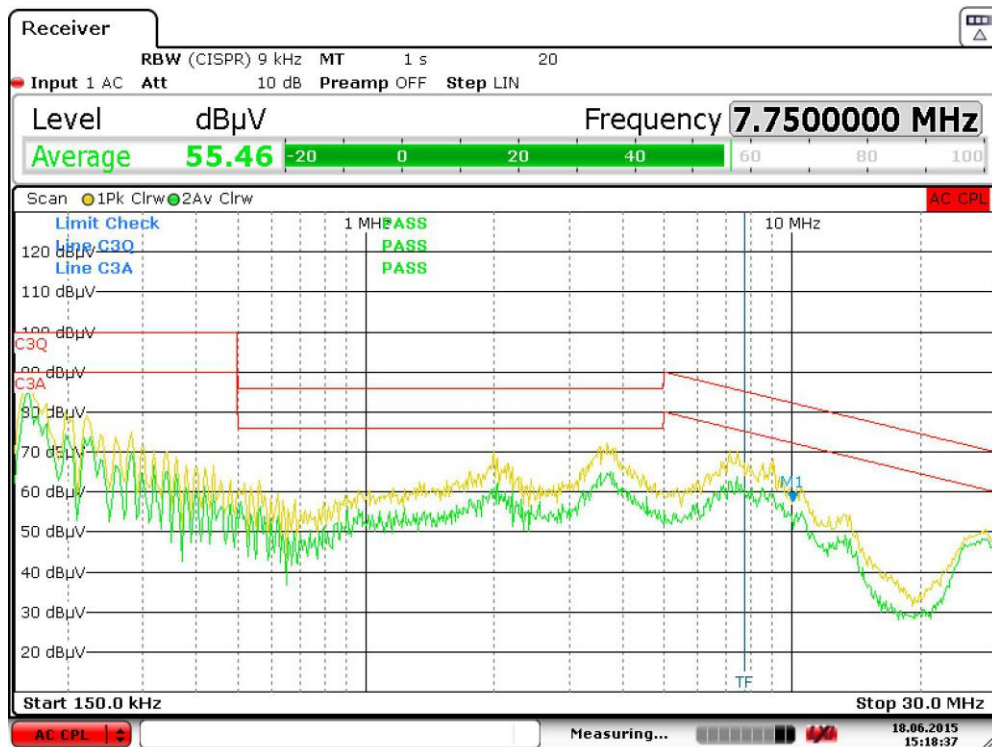
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1600	71.67	0.00	71.67	100.00	-28.33	QP	
2		0.1600	64.42	0.00	64.42	90.00	-25.58	AVG	
3		3.0000	66.81	0.00	66.81	86.00	-19.19	QP	
4		3.0000	56.27	0.00	56.27	76.00	-19.73	AVG	
5	*	11.8000	74.94	0.00	74.94	80.42	-5.48	QP	
6		11.8000	63.23	0.00	63.23	70.42	-7.19	AVG	

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

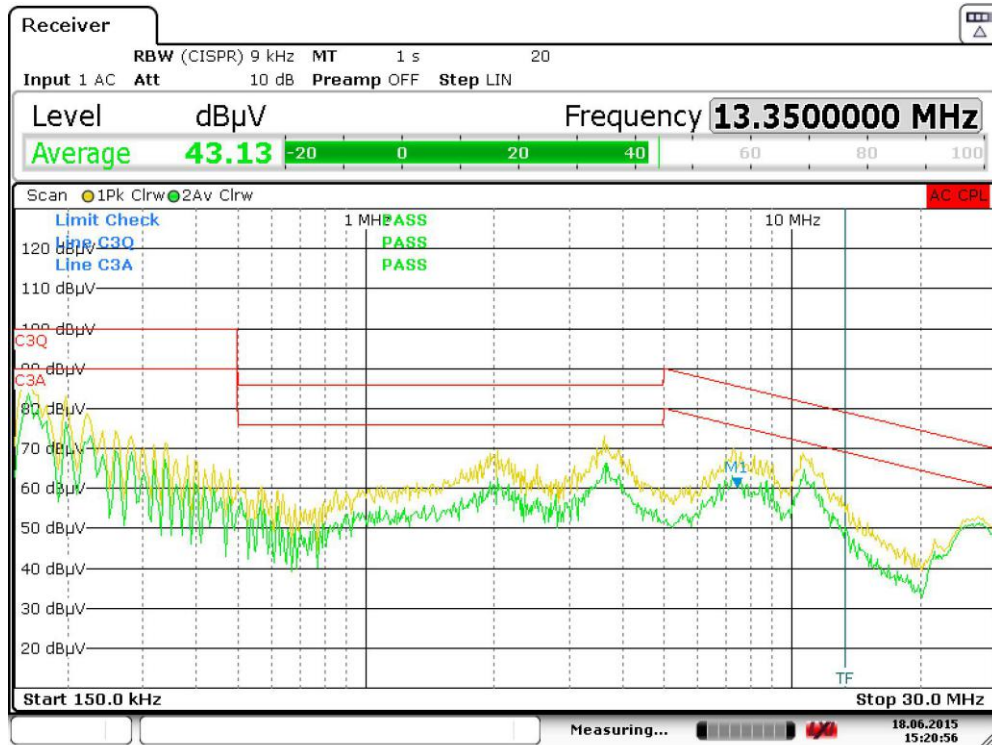
Battery mode:



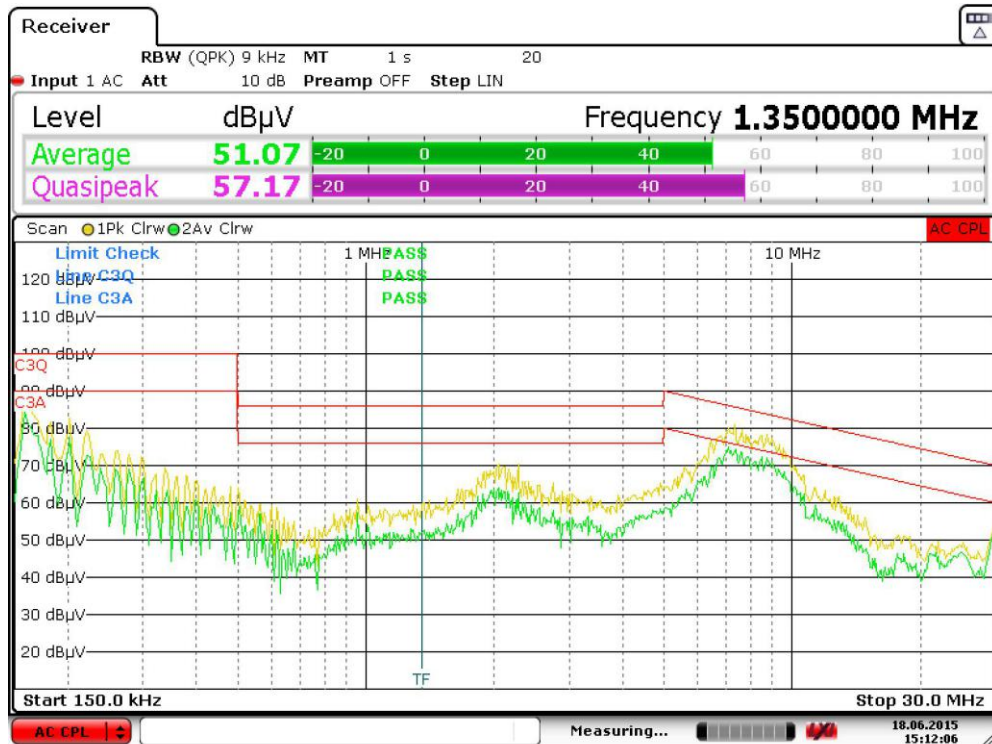
C3
Date: 18.JUN.2015 15:16:05



C3
Date: 18.JUN.2015 15:18:37



C3
Date: 18.JUN.2015 15:20:55



C3
Date: 18.JUN.2015 15:12:07

5. RADIATED EMISSION MEASUREMENT

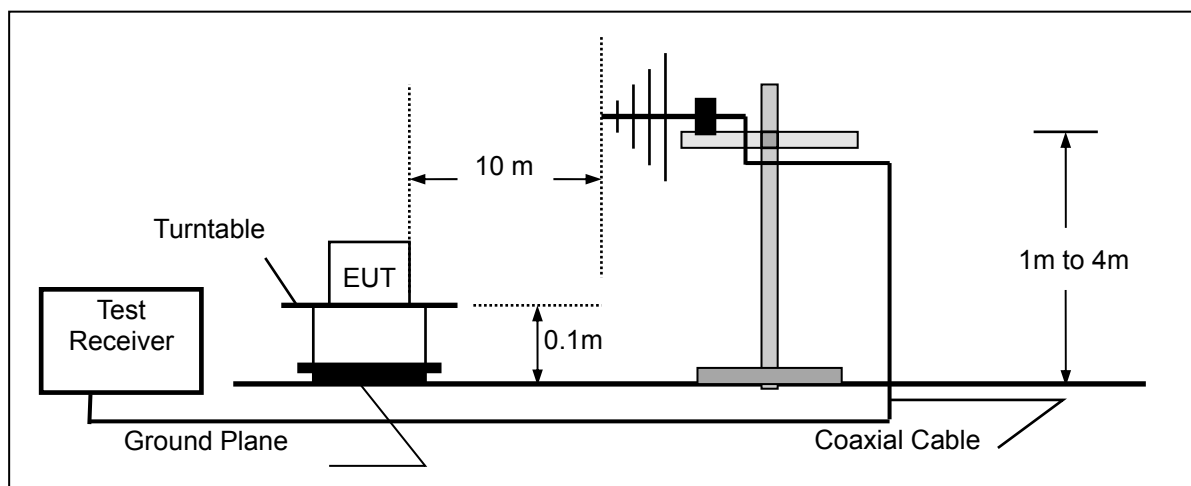
5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Uninterruptible Power System)

5.1.2. Block diagram of test setup (In chamber)



(EUT: Uninterruptible Power System)

5.2. Measuring Standard

EN 62040-2:2006 Category C3

5.3. Radiated Emission Limits

All emanations from 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	3	50
230 ~ 1000	3	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.

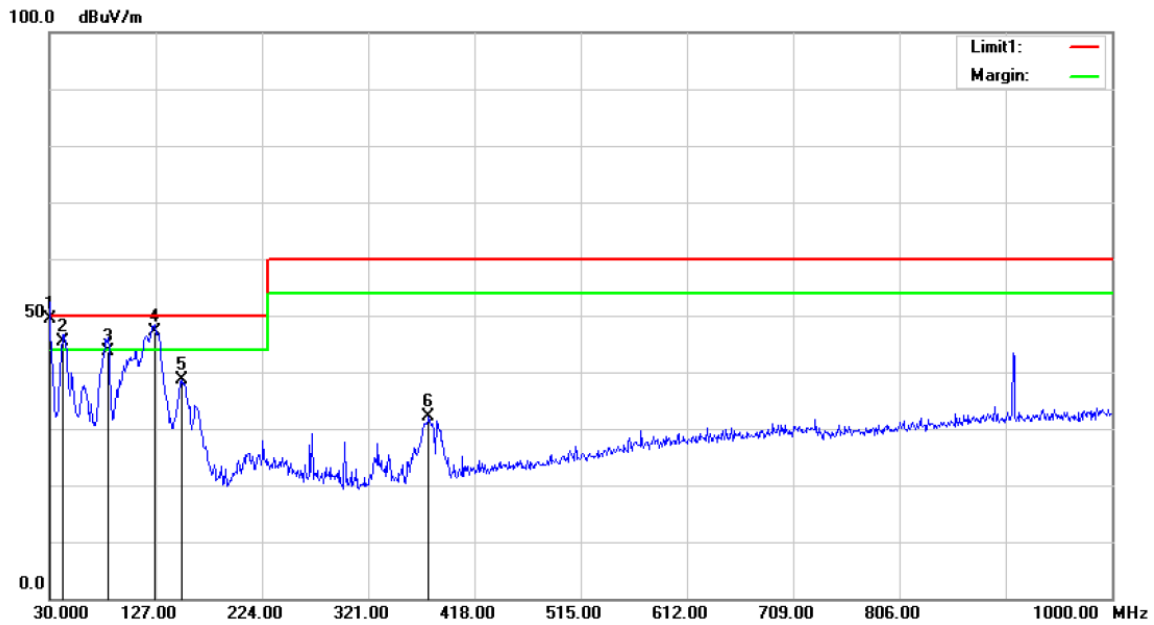
All the scanning curves are attached in the following pages.

5.7. Measuring Results

PASS.

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

Please refer to the following pages.



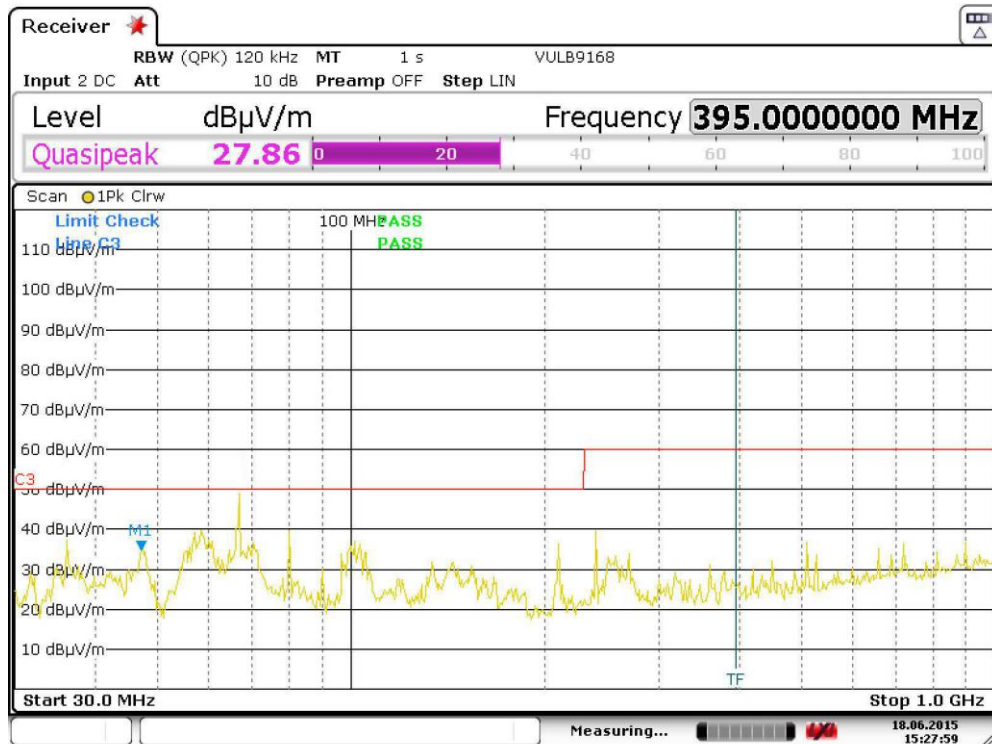
Site :10m Chamber #1 Polarization: **Vertical** Temperature: 26
 Limit: (RE 10M)EN62040-2 C3 Power: AC 380V/50Hz Humidity: 60 %
 Mode:FULL LOAD
 Note: LINE MODE

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	*	30.5000	82.30	-32.90	49.40	50.00	-0.60	100	260	
2	!	41.6400	75.93	-30.63	45.30	50.00	-4.70			
3		83.3500	78.65	-34.95	43.70	50.00	-6.30			
4	!	126.0300	81.39	-34.14	47.25	50.00	-2.75	100	111	
5		151.2500	73.20	-34.66	38.54	50.00	-11.46			
6		376.2900	58.48	-26.35	32.13	60.00	-27.87			

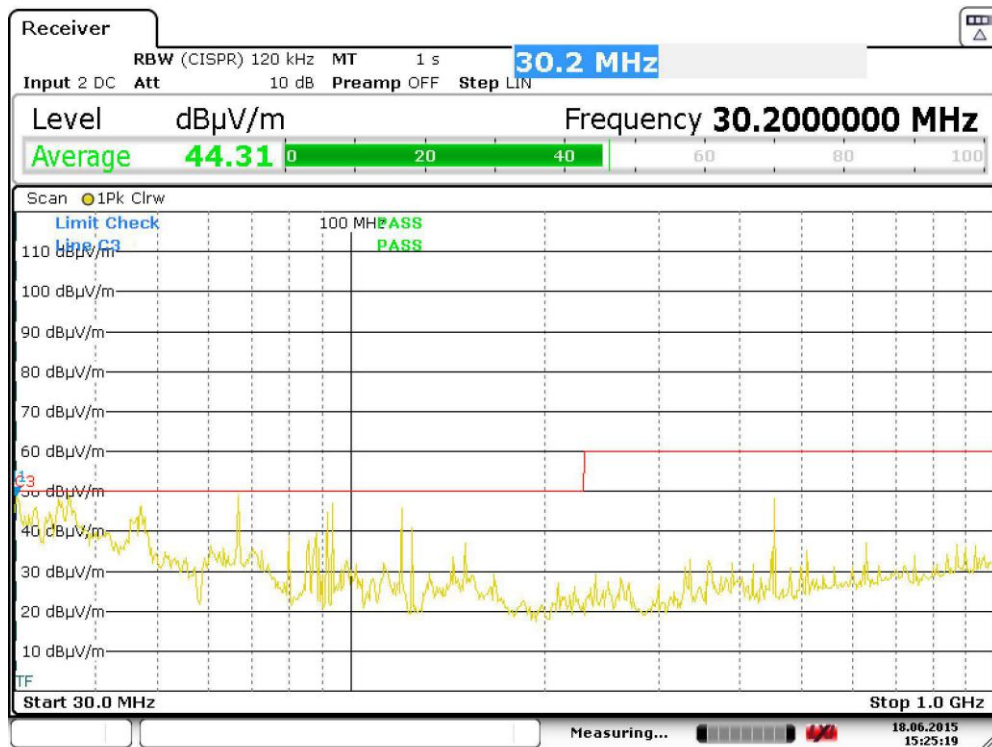
*:Maximum data x:Over limit !:over margin

Operator: CSL

Bat mode:



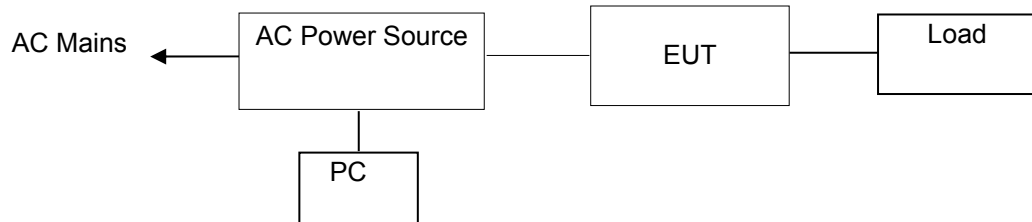
C3
Date: 18.JUN.2015 15:27:59



C3
Date: 18.JUN.2015 15:25:19

6. HARMONIC CURRENT EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



(EUT: Uninterruptible Power System)

6.2. Measuring Standard

EN 62040-2:2006

6.3. Operation Condition of EUT

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

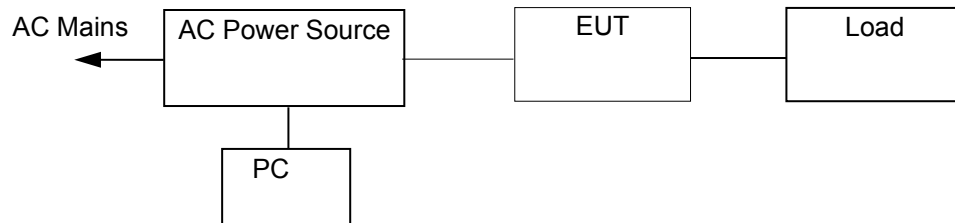
6.4. Measuring Results

Not Applicable.

Because current of EUT more than 16A, According standard EN 62040-2, Harmonic current unnecessary to test.

7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1. Block Diagram of Test Setup



(EUT: Uninterruptible Power System)

7.2. Measuring Standard

EN 62040-2:2006

7.3. Operation Condition of EUT

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

7.4. Measuring Results

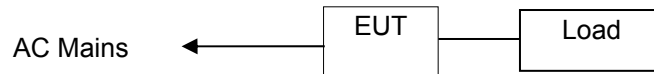
Not Applicable.

Because current of EUT more than 16A, According standard EN 62040, Harmonic current unnecessary to test.

8. ELECTROSTATIC DISCHARGE IMMUNITY TEST

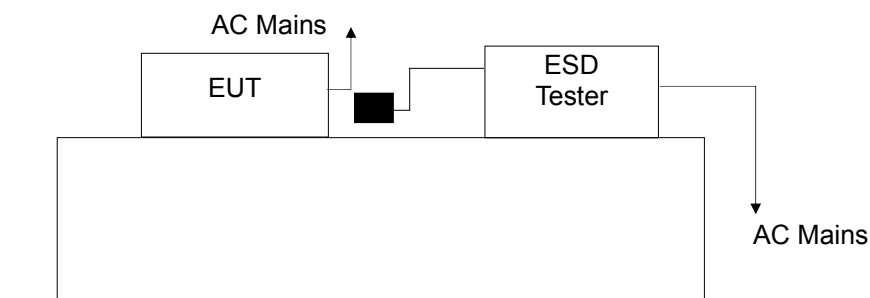
8.1. Block Diagram of Test Setup

8.1.1. Block diagram of connection between the EUT and simulators



(EUT: Uninterruptible Power System)

8.1.2. Block diagram of ESD test setup



(EUT: Uninterruptible Power System)

8.2. Test Standard

IEC 61000-4-2:2008 (Air Discharge: $\pm 8\text{kV}$, Contact Discharge: $\pm 4\text{kV}$)

8.3. Severity Levels and Performance Criterion

8.3.1. 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

8.3.2. Performance criterion: B

Performance criteria for immunity tests

	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable (100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)	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	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

8.4. EUT Configuration

The configurations of EUT are listed in Section 4.3.

8.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.4. except the test set up was replaced by Section 8.1.

8.6. Test Procedure

8.6.1. 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

8.6.2. Contact Discharge:

All the procedure shall be same as Section 8.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.6.3. 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.

8.6.4. 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.

8.7. Test Results

PASS

Please refer to the following page.

Electrostatic Discharge Test Result

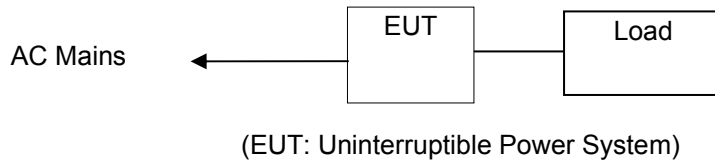
EMTEK(SHENZHEN) CO., LTD.

Applicant : INVT Power System (Shenzhen) Co., Ltd	Test Date : May 14, 2015	
EUT : Uninterruptible Power System	Temperature : 22°C	
M/N : HT33040XL	Humidity : 50%	
Power Supply : AC 380V/50Hz	Criterion : B	
Test Mode : Line mode, Bat mode	Air discharge : ±8.0kV	
Test Engineer : Yu Hai	Contact discharge : ±4.0kV	
Location	Kind A-Air Discharge C-Contact Discharge	Result
Slot	A	PASS
Port	C	PASS
Metal	C	PASS
Screw	C	PASS
Screen	A	PASS
LCD	A	PASS
HCP	C	PASS
VCP of front	C	PASS
VCP of rear	C	PASS
VCP of left	C	PASS
VCP of right	C	PASS

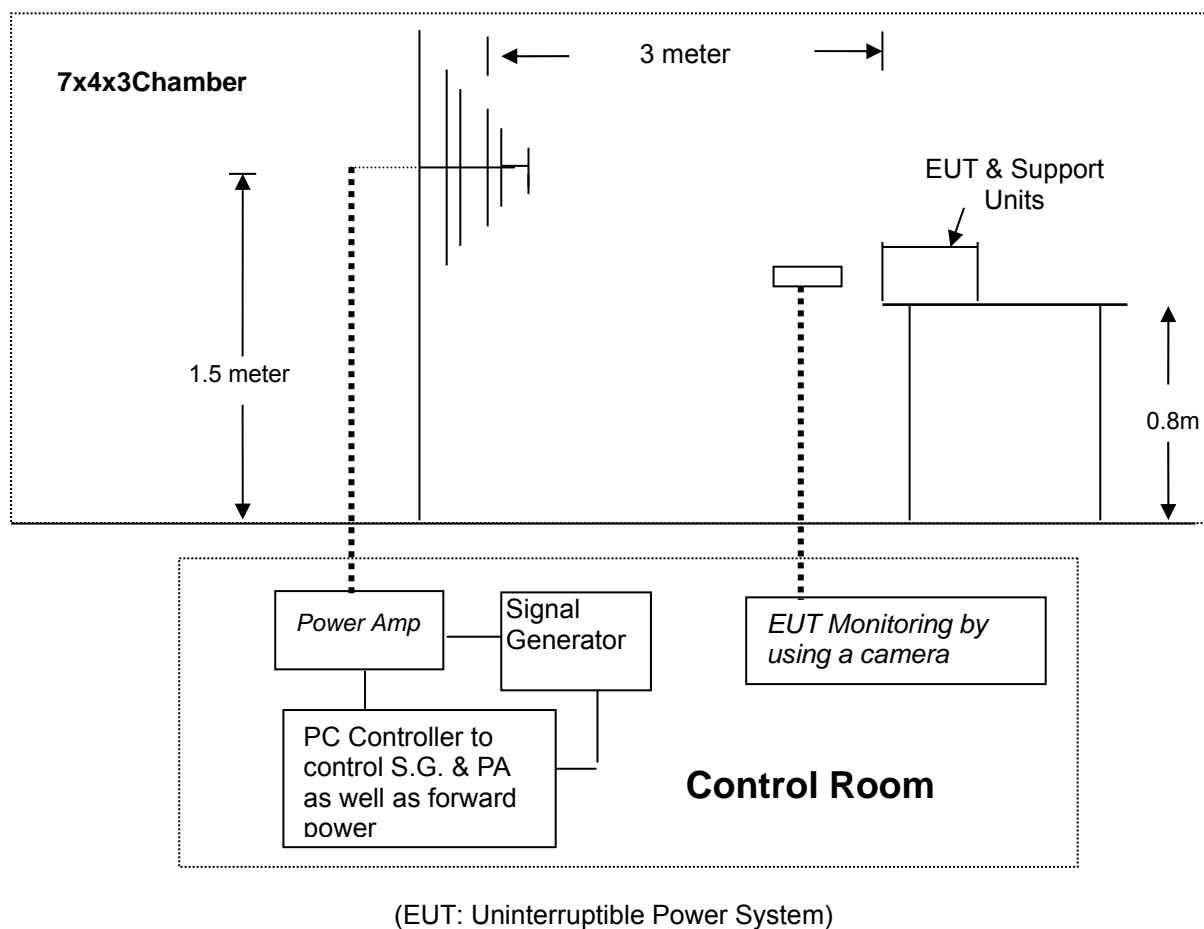
9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

9.1. Block Diagram of Test Setup

9.1.1. Block diagram of connection between the EUT and Load



9.1.2. Block diagram of RS test setup



9.2. Test Standard

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

9.3. Severity Levels and Performance Criterion

9.3.1. Severity Levels

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

9.3.2. Performance Criterion: A

Performance criteria for immunity tests

	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable (100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)	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	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

9.4. EUT Configuration on Test

The configuration of the EUT is same as Section 4.3.

9.5. Operating Condition of EUT

Same as radiated emission measurement which is listed in Section 4.4, except the test setup replaced as Section 9.1.

9.6. Test Procedure

The EUT are placed on a table which is 0.8 meter 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 is 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 it.

All the scanning conditions are as following:

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

9.7. Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

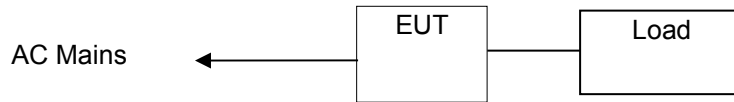
EMTEK(SHENZHEN) CO., LTD.

<table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-bottom: 1px solid black;">Applicant</td><td style="border-bottom: 1px solid black;">: INVT Power System (Shenzhen) Co., Ltd</td></tr> <tr><td style="border-bottom: 1px solid black;">EUT</td><td style="border-bottom: 1px solid black;">: Uninterruptible Power System</td></tr> <tr><td style="border-bottom: 1px solid black;">M/N</td><td style="border-bottom: 1px solid black;">: HT33040XL</td></tr> <tr><td style="border-bottom: 1px solid black;">Field Strength</td><td style="border-bottom: 1px solid black;">: 10V/m</td></tr> <tr><td style="border-bottom: 1px solid black;">Power Supply</td><td style="border-bottom: 1px solid black;">: AC 380V/50Hz</td></tr> <tr><td style="border-bottom: 1px solid black;">Test Engineer</td><td style="border-bottom: 1px solid black;">: Yu Hai</td></tr> </table>	Applicant	: INVT Power System (Shenzhen) Co., Ltd	EUT	: Uninterruptible Power System	M/N	: HT33040XL	Field Strength	: 10V/m	Power Supply	: AC 380V/50Hz	Test Engineer	: Yu Hai	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-bottom: 1px solid black;">Test Mode:</td><td style="border-bottom: 1px solid black;">Line mode, Bat mode</td></tr> <tr><td style="border-bottom: 1px solid black;">Temperature:</td><td style="border-bottom: 1px solid black;">22°C</td></tr> <tr><td style="border-bottom: 1px solid black;">Humidity :</td><td style="border-bottom: 1px solid black;">50%</td></tr> <tr><td style="border-bottom: 1px solid black;">Criterion:</td><td style="border-bottom: 1px solid black;">A</td></tr> <tr><td style="border-bottom: 1px solid black;">Test Date</td><td style="border-bottom: 1px solid black;">May 14, 2015</td></tr> <tr><td style="border-bottom: 1px solid black;">Frequency Range:</td><td style="border-bottom: 1px solid black;">80 to 1000 MHz</td></tr> </table>	Test Mode:	Line mode, Bat mode	Temperature:	22°C	Humidity :	50%	Criterion:	A	Test Date	May 14, 2015	Frequency Range:	80 to 1000 MHz
Applicant	: INVT Power System (Shenzhen) Co., Ltd																								
EUT	: Uninterruptible Power System																								
M/N	: HT33040XL																								
Field Strength	: 10V/m																								
Power Supply	: AC 380V/50Hz																								
Test Engineer	: Yu Hai																								
Test Mode:	Line mode, Bat mode																								
Temperature:	22°C																								
Humidity :	50%																								
Criterion:	A																								
Test Date	May 14, 2015																								
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																							
	Horizontal	Vertical	Horizontal	Vertical																					
Front	PASS	PASS																							
Right	PASS	PASS																							
Rear	PASS	PASS																							
Left	PASS	PASS																							
Test Equipment : 1. Signal Generator : 2023B (AEROFLEX) 2. Power Amplifier : AP32MT215(PRANA) 3. Log.-Per.Antenna: VULP9118E (SCHWARZBECK) 4. RF Power Meter. Dual Channel: 4232A (BOONTON) 5. Field Strength Meter: HI-6005 (HOLADAY)																									

10. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

10.1. Block Diagram of Test Setup

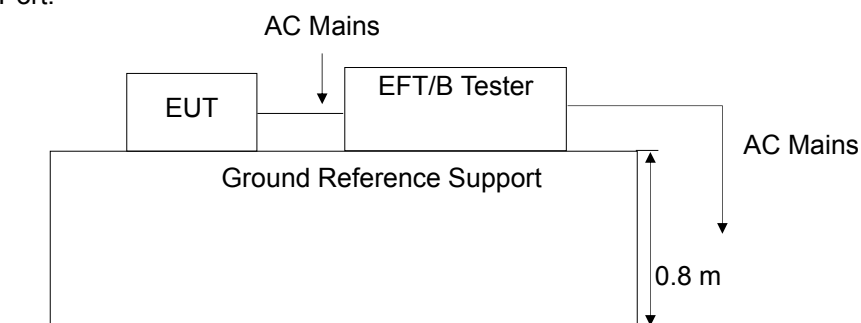
10.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power System)

10.1.2. EFT Test Setup

AC Port:



(EUT: Uninterruptible Power System)

10.2. Test Standard

IEC 61000-4-4:2012 (Level 3: 2kV)

10.3. Severity Levels and Performance Criterion

10.3.1. 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

10.3.2.Performance criterion: B

Performance criteria for immunity tests

	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable (100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)	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	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

10.4.EUT Configuration

The configurations of EUT are listed in Section 4.3.

10.5.Operating Condition of EUT

10.5.1.Setup the EUT as shown in Section 10.1.

10.5.2.Turn on the power of all equipments.

10.5.3.Let the EUT work in test mode (Line mode, Bat mode) and measure it.

10.6.Test Procedure

The EUT is put on the table which is 0.8 meter 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.

10.6.1.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.

10.6.2.For signal lines and control lines ports:

It's unnecessary to test.

10.6.3.For DC output line ports:

It's unnecessary to test.

10.7.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 System </u>			
M/N : <u> HT33040XL </u>			
Input Voltage: <u> AC 380V/50Hz </u>			
Criterion : <u> B </u>			
Ambient Condition : <u> 23 °C </u>		<u> 55% RH </u>	
Operation Mode: Line mode, Bat mode			
Line : <input checked="" type="checkbox"/> AC Mains		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(-)
L	2kV	PASS	PASS
N	2kV	PASS	PASS
PE	2kV	PASS	PASS
L、N	2kV	PASS	PASS
L、PE	2kV	PASS	PASS
N、PE	2kV	PASS	PASS
L、N、PE	2kV	PASS	PASS
Test Equipment: Burst Tester Model : PEFT 4010			

11. SURGE IMMUNITY TEST

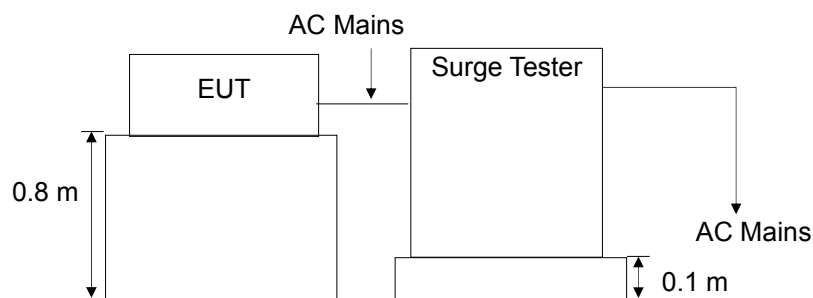
11.1. Block Diagram of Test Setup

11.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power System)

11.1.2. Surge Test Setup



(EUT: Uninterruptible Power System)

11.2. Test Standard

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

11.3. Severity Levels and Performance Criterion

11.3.1. Severity level

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

11.3.2. Performance criterion: B

Performance criteria for immunity tests

	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable (< 100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)	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	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

11.4.EUT Configuration

The configurations of EUT are listed in Section 4.3.

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 equipments.

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

11.6.Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.1.2.
For line to line coupling mode, provide a 1.0 kV 1.2/50us voltage surge
For line to earth coupling mode, provide a 2.0 kV 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.

11.7.Test Result

PASS.

Please refer to the following page.

Surge Immunity Test Result

EMTEK(SHENZHEN) CO., LTD.

Applicant: <u>INVT POWER SYSTEM (SHENZHEN) CO., LTD</u>				Test Date : <u>May 14, 2015</u>	
EUT : <u>Uninterruptible Power System</u>				Temperature : <u>23°C</u>	
M/N : <u>HT33040XL</u>				Humidity : <u>51%</u>	
Power Supply: <u>AC 380V / 50Hz</u>				Test Mode : <u>Line mode</u>	
Test Engineer: <u>Yu Hai</u>				Criterion : <u>A</u>	
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
L-N	+	0°	5	1.0	PASS
	+	90°	5	1.0	PASS
	+	180°	5	1.0	PASS
	+	270°	5	1.0	PASS
	-	0°	5	1.0	PASS
	-	90°	5	1.0	PASS
	-	180°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-PE	+	0°	5	2.0	PASS
	+	90°	5	2.0	PASS
	+	180°	5	2.0	PASS
	+	270°	5	2.0	PASS
	-	0°	5	2.0	PASS
	-	90°	5	2.0	PASS
	-	180°	5	2.0	PASS
	-	270°	5	2.0	PASS
N-PE	+	0°	5	2.0	PASS
	+	90°	5	2.0	PASS
	+	180°	5	2.0	PASS
	+	270°	5	2.0	PASS
	-	0°	5	2.0	PASS
	-	90°	5	2.0	PASS
	-	180°	5	2.0	PASS
	-	270°	5	2.0	PASS

12. INJECTED CURRENTS SUSCEPTIBILITY TEST

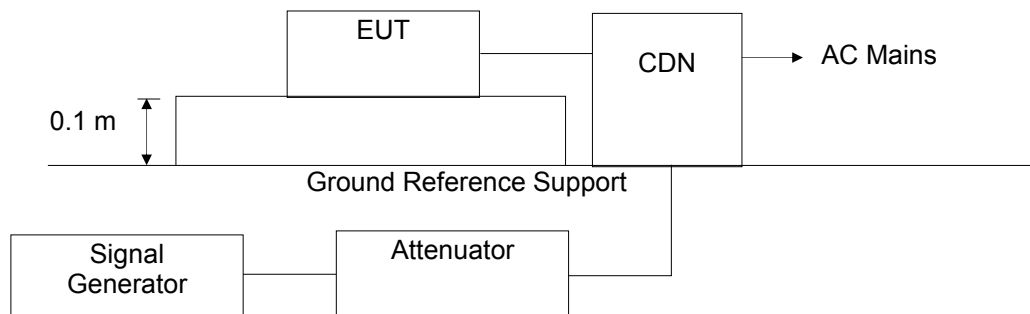
12.1. Block Diagram of Test Setup

12.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power System)

12.1.2. Block Diagram of Test Setup



(EUT: Uninterruptible Power System)

12.2. Test Standard

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

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

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

12.3.2.Performance criterion: A

Performance criteria for immunity tests

	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable (100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)	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	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

12.4.EUT Configuration

The configurations of EUT are 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 equipments.

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

12.6.Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 12.1.2.
- 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 $1.5 \cdot 10^{-3}$ 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.

12.7.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> EUT : <u>Uninterruptible Power System</u> M/N : <u>HT33040XL</u> Power Supply : <u>AC 380V/50Hz</u> Test Engineer : <u>Yu Hai</u>			Test Date: <u>May 14, 2015</u> Temperature : <u>23°C</u> Humidity : <u>50%</u>	
Test Mode : <u>Line mode</u>				
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Mains	10V	A	PASS
Remark : 1. Modulation Signal:1kHz 80% AM Measurement Equipment : Simulator: CWS 500 (SWITZERLAND EMTEST) CDN : <input type="checkbox"/> CDN-M2 (SWITZERLAND EMTEST) <input checked="" type="checkbox"/> CDN-M3 (SWITZERLAND EMTEST) <input type="checkbox"/> Injection Clamp (EMTEST F-2031-23MM)				

13. MAGNETIC FIELD SUSCEPTIBILITY TEST

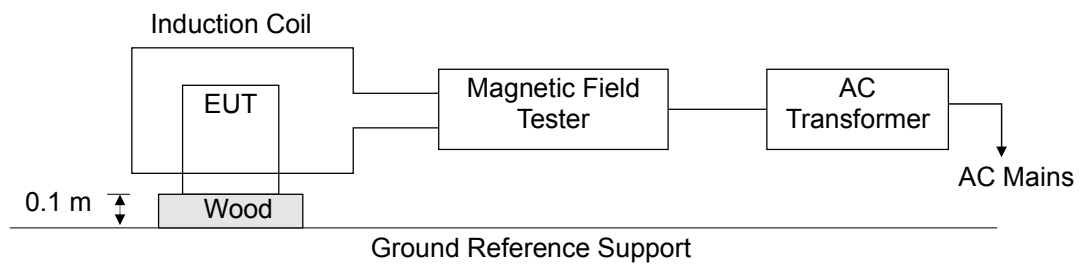
13.1. Block Diagram of Test Setup

13.1.1. Block diagram of test setup



(EUT: Uninterruptible Power System)

13.1.2. Magnetic field test setup



(EUT: Uninterruptible Power System)

13.2. Test Standard

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

13.3. Severity Levels and Performance Criterion

13.3.1. Severity Levels

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

13.3.2.Performance Criterion: A

Performance criteria for immunity tests

	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable (100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)	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	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

13.4.EUT Configuration on Test

The configuration of the EUT is same as Section 4.3.

13.5.Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (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 it can reach the same aim by change the position of the EUT.

13.6.Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Result

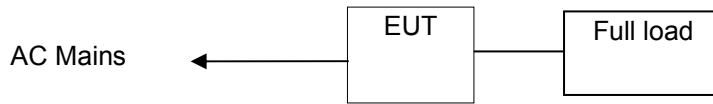
EMTEK(SHENZHEN) CO., LTD.

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 System</u>		M/N: <u>HT33040XL</u>		
Input Voltage : <u>230V</u> / <u>50Hz</u>				
Date of Test : <u>May 14, 2015</u>		Test Engineer: <u>Yu Hai</u>		
Ambient Condition : Temp : <u>23°C</u>		Humid: <u>51%</u>		
Criterion : A				
Operation Mode : <u>Line mode, Bat mode</u>				
Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result
30	5 mins	X	A	PASS
30	5 mins	Y	A	PASS
30	5 mins	Z	A	PASS
Test Equipment : Magnetic Field Test : HEAFELY MAG 100.1				

14. VOLTAGE DIPS AND INTERRUPTIONS TEST

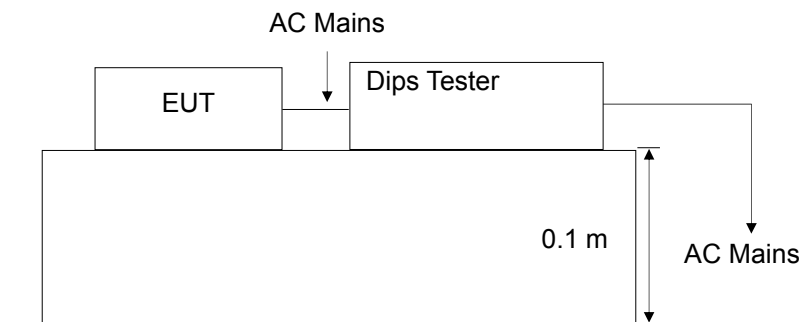
14.1. Block Diagram of Test Setup

14.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power System)

14.1.2. Dips Test Setup



(EUT: Uninterruptible Power System)

14.2. Test Standard

IEC 61000-4-11:2004

14.3. Severity Levels and Performance Criterion

14.3.1. Severity level

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

14.3.2.Performance criterion: A

Performance criteria for immunity tests

	Criterion A	Criterion B
Output characteristics	Voltage permitted to vary only within the steady-state characteristics applicable (100 m sec limits in Figures 1, 2 or 3 of IEC 62040-3)	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	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation	No change	Change only temporarily

14.4.EUT Configuration

The configurations of EUT are listed in Section 4.3.

14.5.Operating Condition of EUT

14.5.1.Setup the EUT as shown in Section 14.1.

14.5.2.Turn on the power of all equipments.

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

14.6.Test Procedure

14.6.1.Set up the EUT and test generator as shown on Section 14.1.2.

14.6.2.The interruption is introduced at selected phase angles with specified duration.

14.6.3.Record any degradation of performance.

14.7.Test Result

PASS.

Please refer to the following page.

Voltage Dips and Interruptions Test Results

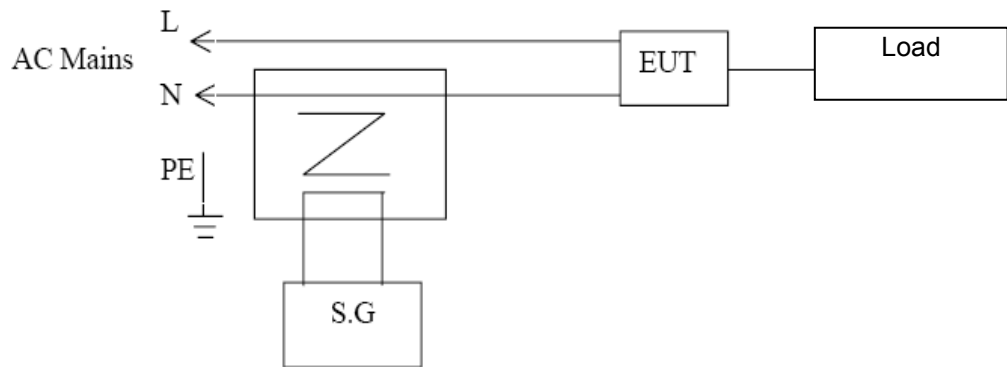
EMTEK(SHENZHEN) CO., LTD.

Applicant: <u>INVT POWER SYSTEM (SHENZHEN) CO., LTD</u>		Test Date : <u>May 14, 2015</u>		
EUT : <u>Uninterruptible Power System</u>		Temperature : <u>22°C</u>		
M/N : <u>HT33040XL</u>		Humidity : <u>50%</u>		
Power Supply : <u>AC230V/50Hz</u>		Test Engineer : <u>Yu Hai</u>		
Test Mode: <u>Line mod</u>				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	Result P=PASS F=Fail
0	100	250P	A	P
70	30	25P	A	P
0	100	0.5P	A	P
Test Equipment : HEAFELY: Pline1610				

15. LOW FREQUENCY SIGNALS TEST

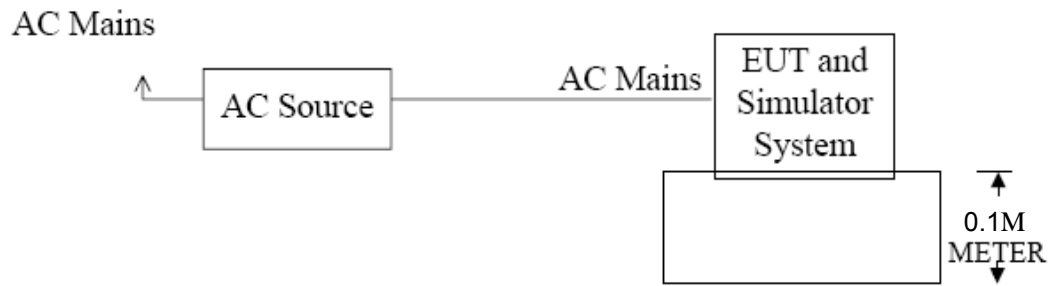
15.1. Block Diagram of Test Setup

15.1.1. Block Diagram of the EUT



(EUT: Uninterruptible Power System)

15.1.2. Block Diagram of Test Setup



(EUT: Uninterruptible Power System)

15.2. Test Standard

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

15.3. Operating Condition of EUT

Same as Section 4.5, Except the test setup replaced by Section 15.1.

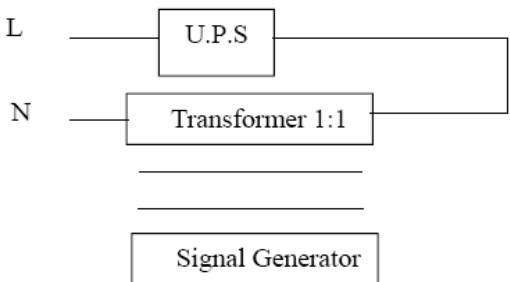
15.4. Test Results

PASS.

Please refer to following page.

Low Frequency Signals Test Result

EMTEK(SHENZHEN) CO., LTD.

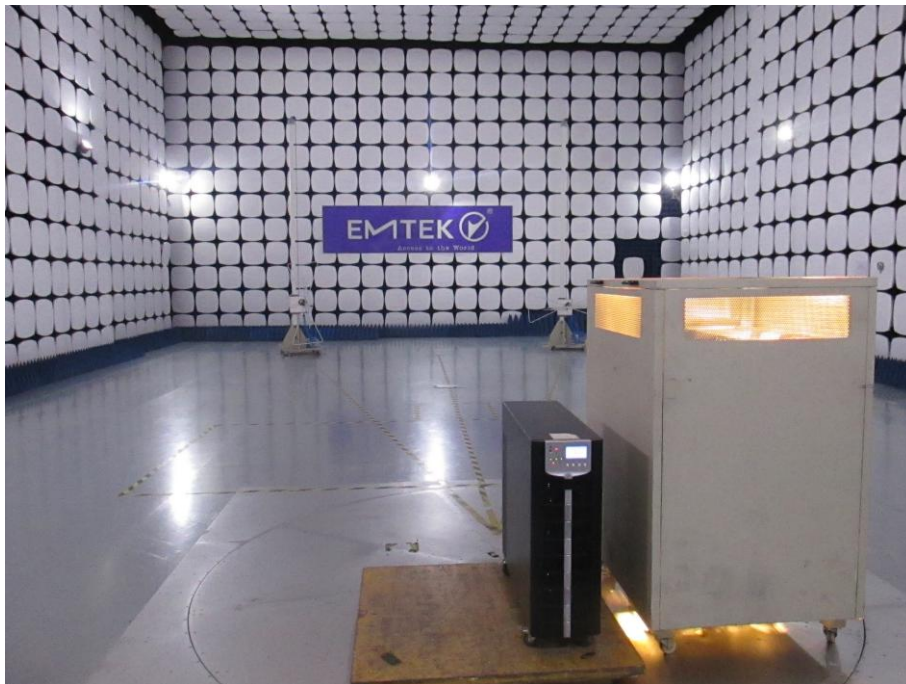
Applicant : <u>INVT POWER SYSTEM (SHENZHEN) CO., LTD</u> EUT : <u>Uninterruptible Power System</u> M/N : <u>HT33040XL</u> Power Supply : <u>AC 380V/50Hz</u> Test Engineer : <u>Yu Hai</u>			Test Date: <u>May 14, 2015</u> Temperature : <u>23°C</u> Humidity : <u>51%</u> Test Mode : <u>Line mode, Bat mode</u>	
Frequency Range (Hz)	Position	Strength	Result	Note
140	See Fig.1	10V(rms) Sinusoidal	PASS	N/A
160			PASS	
200			PASS	
240			PASS	
280			PASS	
320			PASS	
360			PASS	
Note: 			Test Equipment: 1. Isolation transformer Primary: Secondary=1:1 2. Signal Generator AC Source: 65930 (Chroma)	

16. TEST PHOTOGRAPHS

16.1. Photo of Conducted Emission Measurement



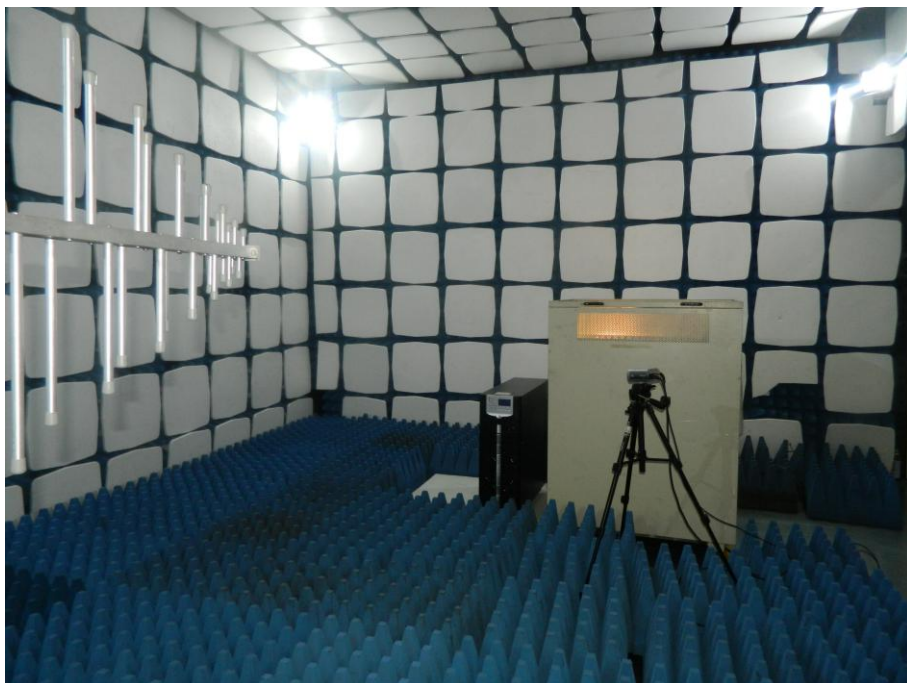
16.2. Photo of Radiation Emission Measurement



16.3. Photo of Electrostatic Discharge Test



16.4. Photo of RF Field Strength Susceptibility Test



16.5. Photo of Electrical Fast Transient / Burst Test



16.6. Photo of Surge Test



16.7. Photo of Injected Currents Susceptibility Test



16.8. Photo of Magnetic Field Immunity Test



16.9. Photo of Voltage Dips and Interruptions Test



16.10. Photo of Low Frequency Signals Test



APPENDIX (PHOTOS OF EUT)



