Standards EN62040-2: 2006

TEST REPORT

For

EAST GROUP CO., LTD.

HIGH FREQUENCY ONLINE UPS

Model Number: 10kVA, 15kVA, 20kVA, 30kVA

Prepared for	:	EAST GROUP CO., LTD.
Address	:	No.6 Northern Industry Road, Songshan Lake Sci.& Tech. industrial zone, Dongguan City, Guangdong province, China
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Report Number	:	ES160428009E
Date of Test	:	April 29, 2016 to June 20, 2016
Date of Report	:	June 21, 2016

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TEST REPORT VERIFICATION

Applicant	:	EAST GROUP CO., LTD.
Manufacturer	:	EAST GROUP CO., LTD.
Trademark	:	EAST
EUT	:	HIGH FREQUENCY ONLINE UPS
Model Number	:	10kVA, 15kVA, 20kVA, 30kVA
Power Supply	:	INPUT: 360/380/400/415Vac, 50/60Hz OUTPUT: 360/380/400/415Vac, 50/60Hz

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.

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 29, 2016 to June 20, 2016

Prepared by : Jessie Hu/Editor

Reviewer : Joe Xia/Supervisor

Approved & Authorized Signer : Lisa Wang/Manager

Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ES160428009E	/	Original Report

1. SUMMARY OF TEST RESULT

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	EN 61000-3-12: 2011	Class A	Pass
Voltage Fluctuation and Flicker	EN 61000-3-11:2000	Section 5	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
Note: /			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	HIGH FREQUENCY ONLINE UPS
Model Number	:	10kVA, 15kVA, 20kVA, 30kVA (Note: These models are identical in circuitry and electrical, mechanical and physical construction; the only differences are the output rating and model number. for trading purpose. We prepare 10kVA for EMI test. prepare 30kVA for all the EMC test.)
Test voltage	:	AC 380V/50Hz
Applicant	:	EAST GROUP CO., LTD.
Address	:	No.6 Northern Industry Road, Songshan Lake Sci.& Tech. industrial zone, Dongguan City, Guangdong province, China
Manufacturer	:	EAST GROUP CO., LTD.
Address	:	No.6 Northern Industry Road, Songshan Lake Sci.& Tech. industrial zone, Dongguan City, Guangdong province, China
Date of receiver	:	April 29, 2016
Date of Test	:	April 29, 2016 to June 20, 2016

2.2. 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/IEC17025: 2005)
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Guangzhou 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 24, 2015
The Certificate Registration Number. is 4480A

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

2.3. 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℃ 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Conducted Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 29, 2016	1 Year
☑	L.I.S.N.	Schwarzbeck	NNLK8129	8129-203	May 28, 2016	1 Year
☑	50Ω Coaxial Switch	Anritsu	MP59B	M20531	May 29, 2016	1 Year
☑	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 28, 2016	1 Year

3.2. For Radiated Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	EMI Test Receiver	Rohde & Schwarz	ESR3	1316.3003K03-101706-HN	May 29, 2016	1 Year
☑	EMI Test Receiver	Rohde & Schwarz	ESR3	1316.3003K03-101707-Z1	May 29, 2016	1 Year
☑	Pre-Amplifier	Lunar EM	LNA10M1G-40	J1011130912001	May 28, 2016	1 Year
☑	Pre-Amplifier	Lunar EM	LNA10M1G-40	J1011131126002	May 28, 2016	1 Year
☑	Bilog Antenna	Schwarzbeck	VULB9163	659	May 28, 2016	1 Year
☑	Bilog Antenna	Schwarzbeck	VULB9163	661	May 29, 2016	1 Year
☑	Cable	Times Microwave	LMR-240 N-N 1m	SS26-P1	May 29, 2016	1 Year
☑	Cable	Times Microwave	LMR-240 N-N 1m	SS26-P2	May 29, 2016	1 Year
☑	Cable	Times Microwave	LMR-240 N-N 1.5m	N/A	May 29, 2016	1 Year
☑	Cable	Times Microwave	LMR-240 N-N 1.5m	N/A	May 29, 2016	1 Year
☑	Cable	Times Microwave	LMR-240 N-N 12m	N/A	May 29, 2016	1 Year
☑	Cable	Times Microwave	LMR-240 N-N 11m	N/A	May 29, 2016	1 Year

3.3. For Harmonic Current / Flicker Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 28, 2016	1 Year
☑	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 28, 2016	1 Year
☑	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	N/A	N/A
☑	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	N/A	N/A
☐	Profline 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	N/A	N/A

3.4. For Electrostatic Discharge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	ESD Tester	TESEQ AG	NSG 438A	130	May 29, 2016	1 Year
☑	Impulse Module	TESEQ AG	INA 4380-150pF/330Ohm	403-550/1712	May 29, 2016	1 Year

3.5. For RF Strength Susceptibility Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Signal Generator	Agilent	N5181A	MY50145187	May 28, 2016	1 Year
☑	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 29, 2016	1 Year
☑	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 29, 2016	1 Year
☑	Field Strength Meter	DARE	RSS1006A	10I00037SO 22	May 29, 2016	1 Year
☑	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 29, 2016	1 Year
☑	Power Amplifier	MILMEGA	80RF1000-1 75	1059345	May 28, 2016	1 Year
☐	Power Amplifier	MILMEGA	AS0102-55	1018770	May 28, 2016	1 Year
☑	Power Amplifier	MILMEGA	AS1860-50	1059346	May 28, 2016	1 Year
☑	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May 29, 2016	1 Year
☐	Broad-Band Horn Antenna	SCHWARZBECK	STLP 9149	9149-227	May 29, 2016	1 Year
☑	Multi-function interface system	DARE	CTR1009B	12I00250SN O72	N/A	N/A
☑	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
☑	Burst Tester	HAEFELY	PEFT4010	080981-16	May 29, 2016	1Year
☐	Coupling Clamp	HAEFELY	IP-4A	147147	May 29, 2016	1Year
☑	Three phase CDN	Teseq	CDN 163	202	May 29, 2016	1 Year

3.7. For Surge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Surge Controller	HAEFELY	Psurge 8000	174031	May 29, 2016	1Year
☑	Impulse Module	HAEFELY	PIM 100	174124	May 29, 2016	1Year
☑	Coupling Decoupling Filter	HAEFELY	PCD 130	172181	May 29, 2016	1Year

3.8. For Injected Current Susceptibility Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Simulator	EMTEST	CWS500C	0900-12	May 29, 2016	1 Year
☐	CDN	EMTEST	CDN-M2	5100100100	May 29, 2016	1 Year
☑	CDN	EMTEST	CDN-M3	0900-11	May 29, 2016	1 Year
☐	Injection Clamp	EMTEST	F-2031-23MM	368	May 29, 2016	1Year
☑	Attenuator	EMTEST	ATT6	0010222A	May 29, 2016	1Year
☐	Three phase CDN	Teseq	CDN M332S	32655	May 29, 2016	1 Year
☐	Three phase CDN	Teseq	CDN M432S	33670	May 29, 2016	1 Year
☐	Three phase CDN	Teseq	CDN M432-3LNS	34048	May 29, 2016	1 Year
☑	Three phase CDN	Teseq	CDN M532S	33799	May 29, 2016	1 Year

3.9. For Magnetic Field Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 28, 2016	1Year

3.10.For Voltage Dips and Interruptions Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	45KVA AC Power source	Teseq/Germany	NSG 1007-45/45KVA	1305A02873	May 28, 2016	1 Year
☐	Signal conditioning Unit	Teseq/Germany	CCN 1000-3	1305A02873	May 28, 2016	1 Year
☐	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	N/A	1 Year
☐	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	N/A	1 Year
☑	Profline 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	N/A	1 Year

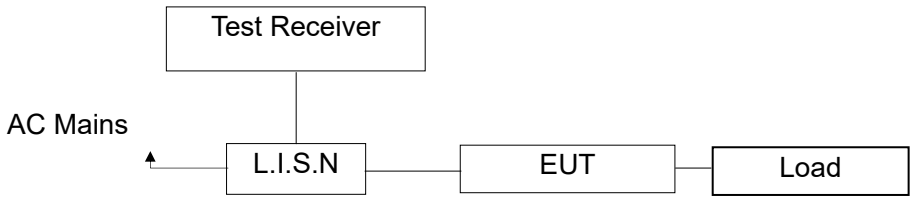
3.11.Low Frequency Signals Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Programmable AC Source	CHROMA	6530	/	May 29, 2016	1Year

4. CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup

For AC Mains：



(EUT: HIGH FREQUENCY ONLINE UPS)

4.2. Measuring Standard

EN62040-2: 2006, Category C3

4.3. Power Line Conducted Emission Limits (C3)

UPS rated output current	Frequency range	Limits dB (μV)	
A	MHz	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 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.

HIGH FREQUENCY ONLINE UPS (EUT)
Model Number : 10kVA, 30kVA
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 equipments.

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

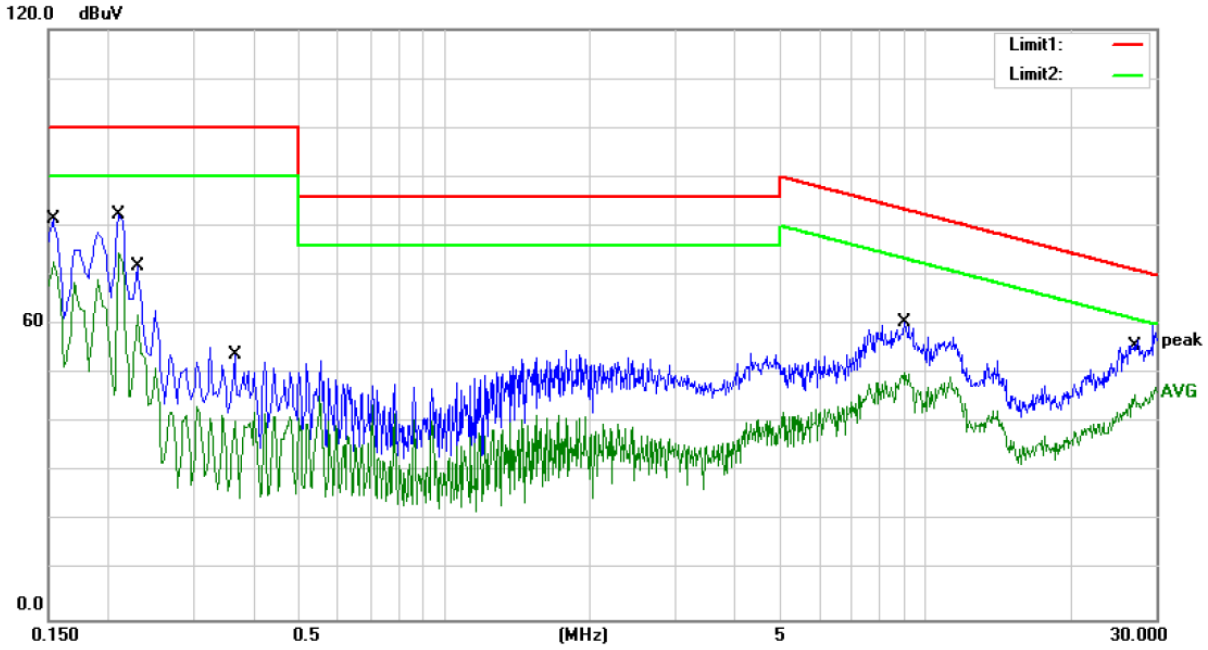
4.6. Test Procedure

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 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.

4.7. Measuring Results

PASS.

Please refer to the following pages.



Site Conducted #3 Phase: *L1* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

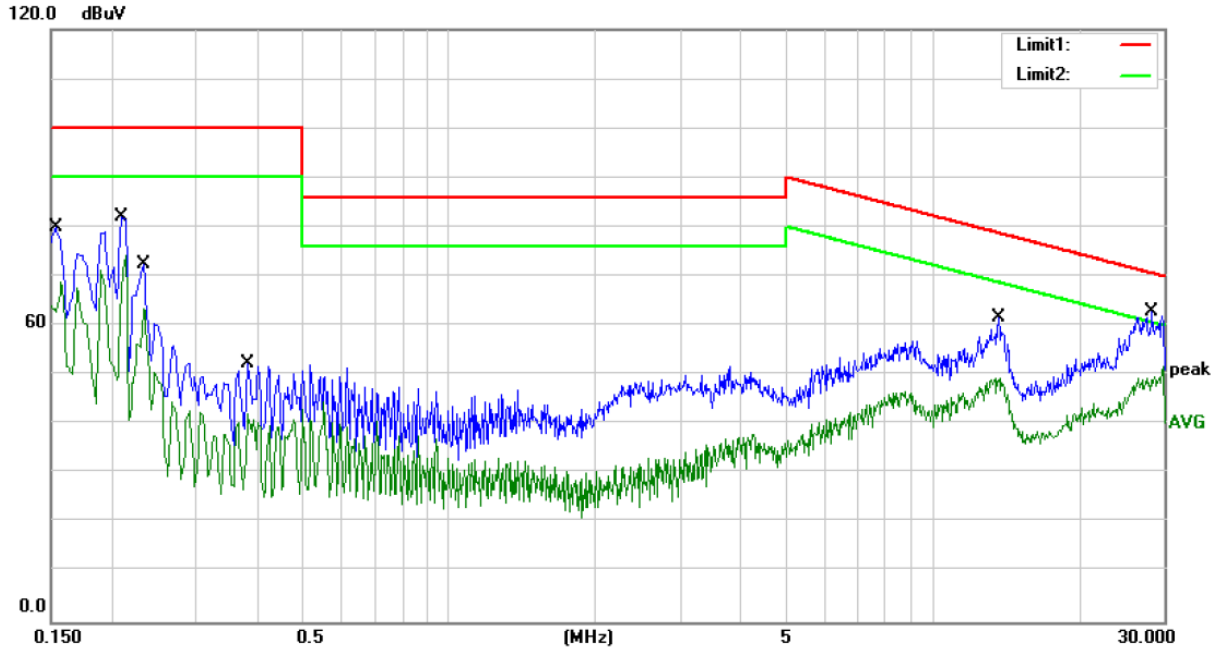
M/N: 10kVA

Mode: BAT MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	71.86	9.62	81.48	100.00	-18.52	QP	
2		0.1540	63.00	9.62	72.62	90.00	-17.38	AVG	
3		0.2100	72.66	9.63	82.29	100.00	-17.71	QP	
4		0.2100	64.89	9.63	74.52	90.00	-15.48	AVG	
5		0.2300	62.31	9.64	71.95	100.00	-28.05	QP	
6		0.2300	52.18	9.64	61.82	90.00	-28.18	AVG	
7		0.3660	44.16	9.68	53.84	100.00	-46.16	QP	
8		0.3660	32.47	9.68	42.15	90.00	-47.85	AVG	
9		8.8700	48.60	11.20	59.80	83.60	-23.80	QP	
10		8.8700	38.51	11.20	49.71	73.60	-23.89	AVG	
11	*	27.0260	41.41	15.41	56.82	71.17	-14.35	QP	
12		27.0260	30.36	15.41	45.77	61.17	-15.40	AVG	

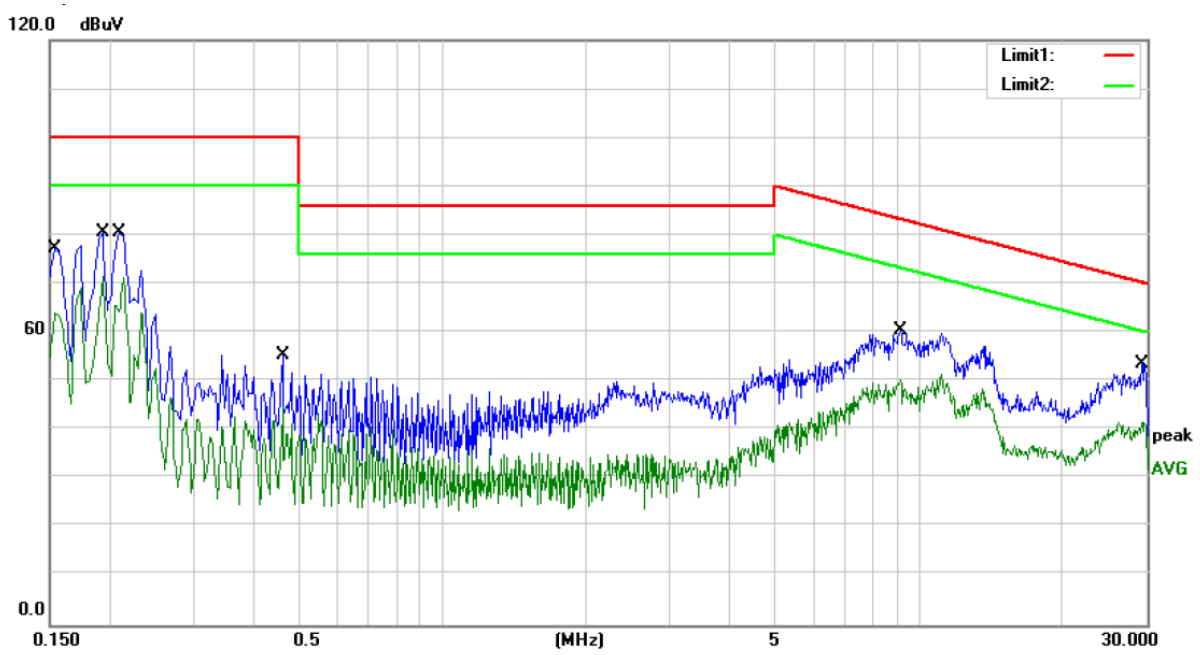
*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator:



Site Conducted #3 Phase: *L2* Temperature: 22
Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %
EUT: HIGH FREQUENCY ONLINE UPS
M/N: 10kVA
Mode: BAT MODE
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	70.34	9.62	79.96	100.00	-20.04	QP	
2		0.1540	59.35	9.62	68.97	90.00	-21.03	AVG	
3		0.2100	72.33	9.63	81.96	100.00	-18.04	QP	
4		0.2100	64.76	9.63	74.39	90.00	-15.61	AVG	
5		0.2340	62.77	9.64	72.41	100.00	-27.59	QP	
6		0.2340	53.67	9.64	63.31	90.00	-26.69	AVG	
7		0.3820	42.56	9.68	52.24	100.00	-47.76	QP	
8		0.3820	32.54	9.68	42.22	90.00	-47.78	AVG	
9		13.7580	48.87	12.75	61.62	78.70	-17.08	QP	
10		13.7580	36.73	12.75	49.48	68.70	-19.22	AVG	
11	*	28.3140	47.09	15.66	62.75	70.65	-7.90	QP	
12		28.3140	35.99	15.66	51.65	60.65	-9.00	AVG	

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



Site Conducted #3 Phase: *L3* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

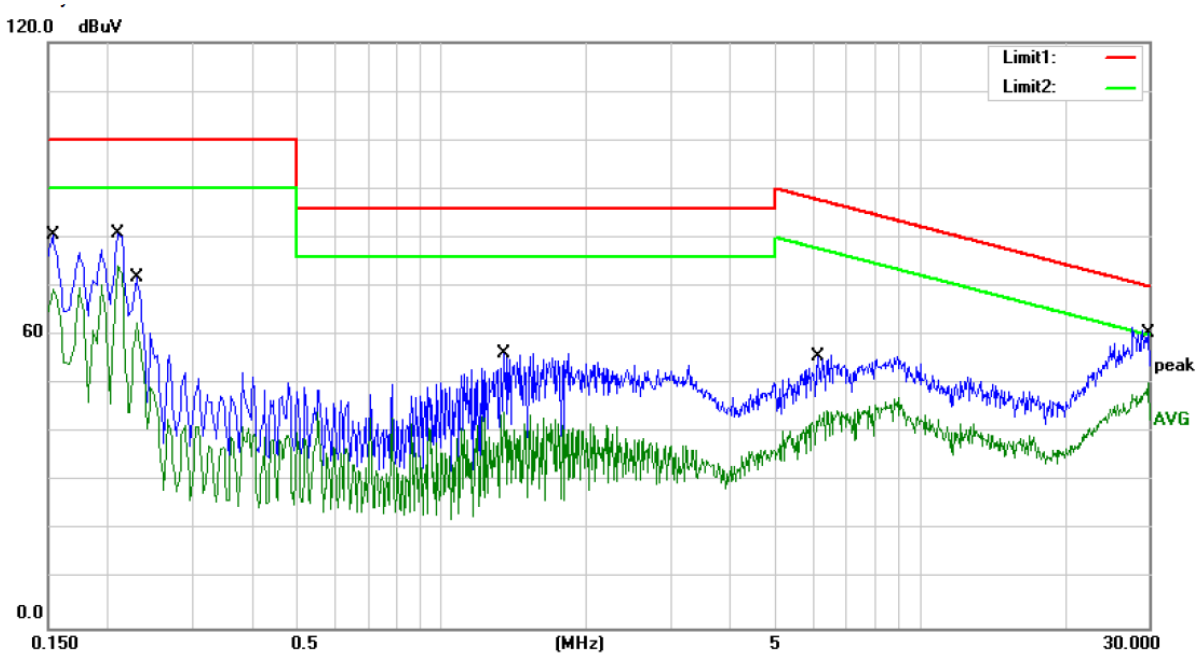
M/N: 10kVA

Mode: BAT MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	67.71	9.62	77.33	100.00	-22.67	QP	
2		0.1540	54.30	9.62	63.92	90.00	-26.08	AVG	
3		0.1940	70.92	9.63	80.55	100.00	-19.45	QP	
4		0.1940	62.01	9.63	71.64	90.00	-18.36	AVG	
5		0.2100	70.85	9.63	80.48	100.00	-19.52	QP	
6		0.2100	61.61	9.63	71.24	90.00	-18.76	AVG	
7		0.4620	45.50	9.70	55.20	100.00	-44.80	QP	
8		0.4620	35.24	9.70	44.94	90.00	-45.06	AVG	
9		9.1220	48.93	11.38	60.31	83.29	-22.98	QP	
10		9.1220	38.89	11.38	50.27	73.29	-23.02	AVG	
11	*	29.2380	37.70	15.85	53.55	70.29	-16.74	QP	
12		29.2380	25.83	15.85	41.68	60.29	-18.61	AVG	

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



Site Conducted #3 Phase: N Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

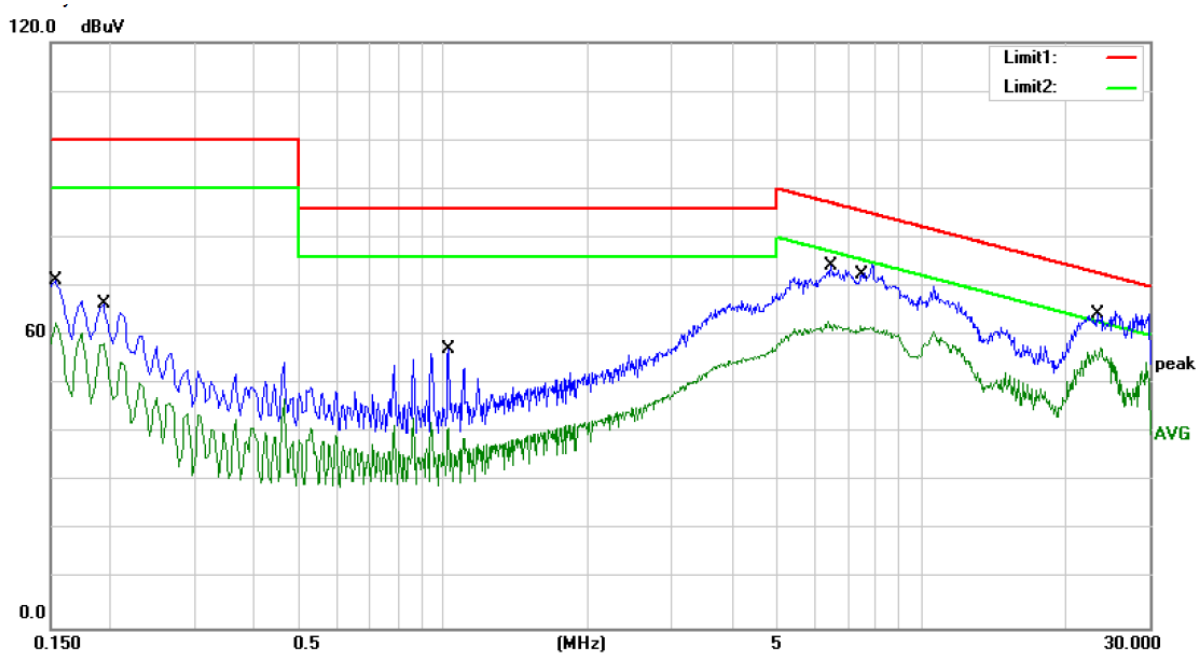
M/N: 10kVA

Mode: BAT MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	70.95	9.62	80.57	100.00	-19.43	QP	
2		0.1540	59.88	9.62	69.50	90.00	-20.50	AVG	
3		0.2100	71.17	9.63	80.80	100.00	-19.20	QP	
4		0.2100	64.49	9.63	74.12	90.00	-15.88	AVG	
5		0.2300	62.17	9.64	71.81	100.00	-28.19	QP	
6		0.2300	52.82	9.64	62.46	90.00	-27.54	AVG	
7		1.3460	46.55	9.85	56.40	86.00	-29.60	QP	
8		1.3460	34.33	9.85	44.18	76.00	-31.82	AVG	
9		6.0940	45.72	9.88	55.60	87.79	-32.19	QP	
10		6.0940	34.81	9.88	44.69	77.79	-33.10	AVG	
11	*	29.9900	45.52	16.00	61.52	70.00	-8.48	QP	
12		29.9900	34.18	16.00	50.18	60.00	-9.82	AVG	

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



Site Conducted #3 Phase: *L1* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

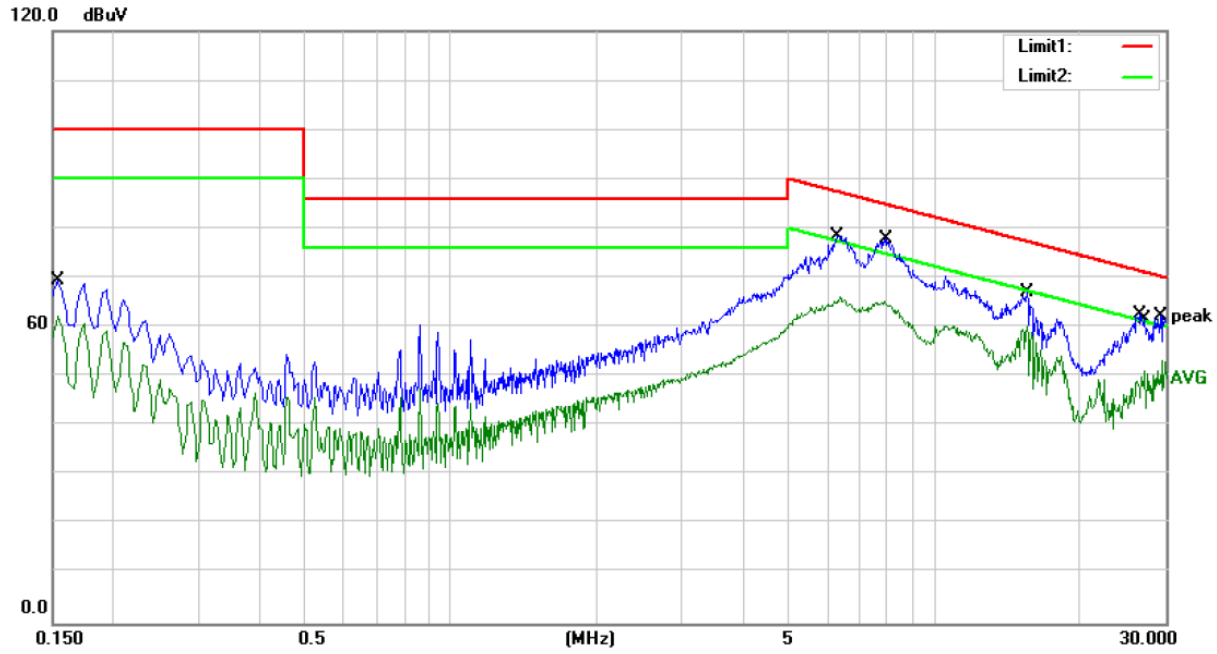
M/N: 10kVA

Mode: LINE MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	61.53	9.62	71.15	100.00	-28.85	QP	
2		0.1540	52.86	9.62	62.48	90.00	-27.52	AVG	
3		0.1940	56.76	9.63	66.39	100.00	-33.61	QP	
4		0.1940	48.71	9.63	58.34	90.00	-31.66	AVG	
5		1.0220	47.27	9.85	57.12	86.00	-28.88	QP	
6		1.0220	32.31	9.85	42.16	76.00	-33.84	AVG	
7		6.4740	64.31	9.88	74.19	87.12	-12.93	QP	
8		6.4740	53.05	9.88	62.93	77.12	-14.19	AVG	
9		7.4740	64.47	10.21	74.68	85.51	-10.83	QP	
10		7.4740	51.69	10.21	61.90	75.51	-13.61	AVG	
11		23.3860	49.54	14.68	64.22	72.78	-8.56	QP	
12	*	23.3860	42.32	14.68	57.00	62.78	-5.78	AVG	

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



Site Conducted #3 Phase: *L2* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

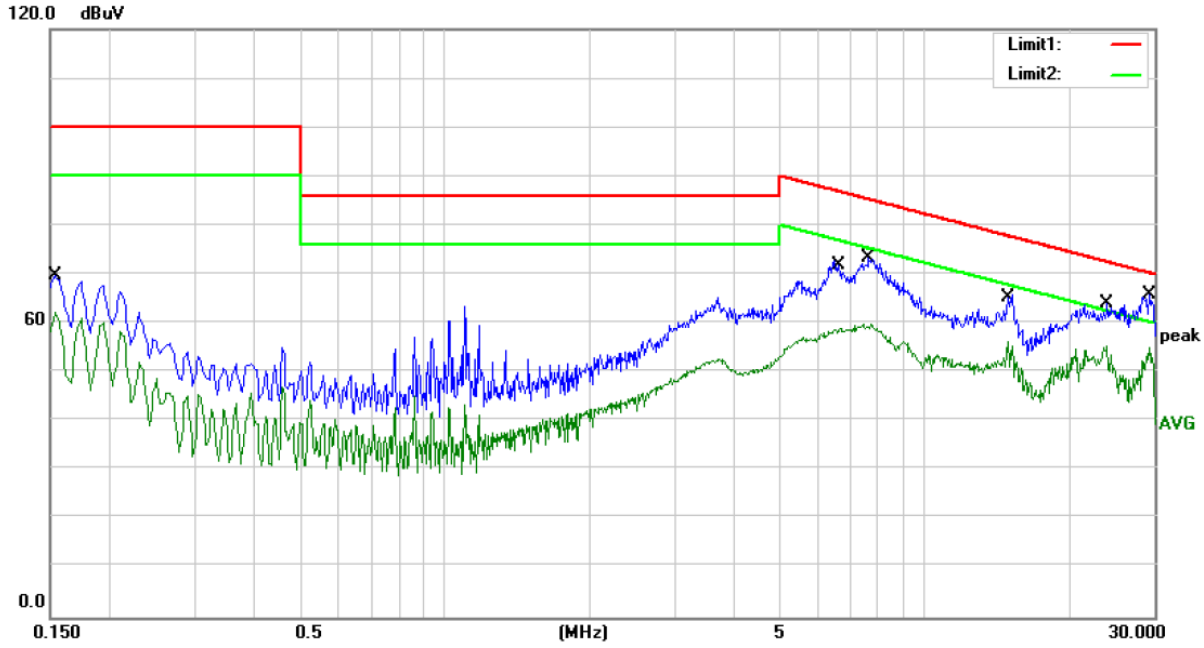
M/N: 10kVA

Mode: LINE MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	59.94	9.62	69.56	100.00	-30.44	QP	
2		0.1540	52.63	9.62	62.25	90.00	-27.75	AVG	
3		6.3020	68.72	9.88	78.60	87.42	-8.82	QP	
4		6.3580	56.12	9.88	66.00	77.32	-11.32	AVG	
5		7.8740	54.71	10.50	65.21	74.93	-9.72	AVG	
6		7.9540	67.28	10.55	77.83	84.82	-6.99	QP	
7		15.4940	53.84	13.10	66.94	77.38	-10.44	QP	
8		15.4940	47.11	13.10	60.21	67.38	-7.17	AVG	
9		26.4740	47.27	15.29	62.56	71.40	-8.84	QP	
10		27.1940	35.67	15.44	51.11	61.10	-9.99	AVG	
11		29.2860	46.51	15.86	62.37	70.27	-7.90	QP	
12	*	29.6140	37.37	15.92	53.29	60.14	-6.85	AVG	

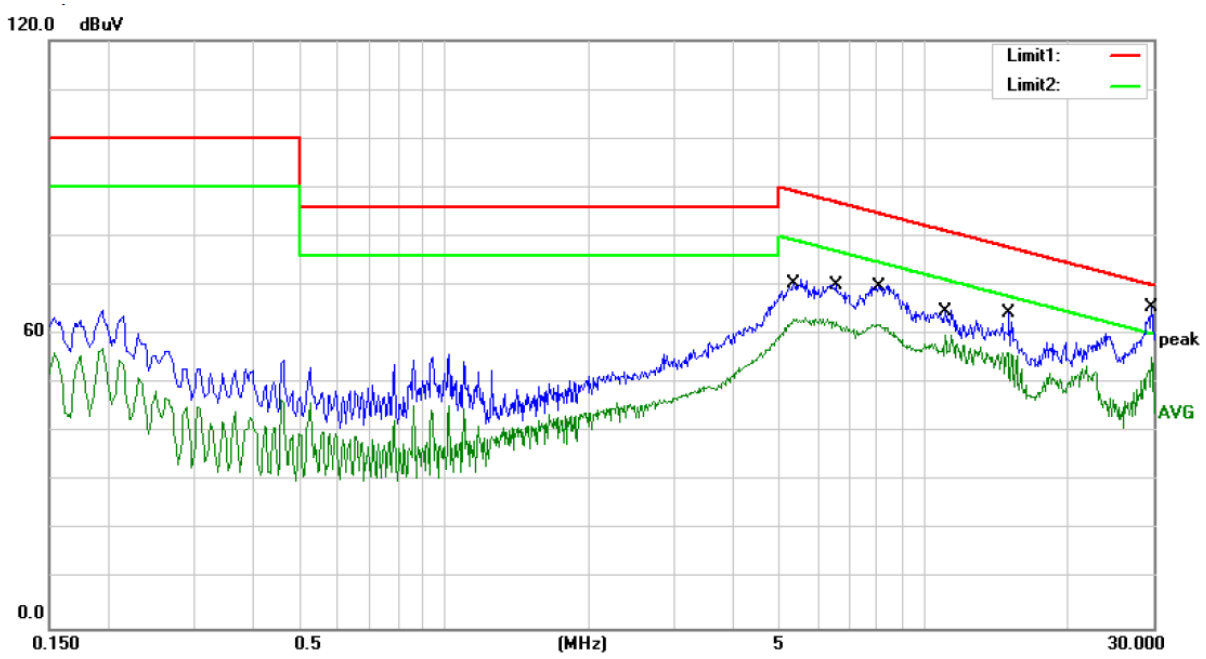
*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator:



Site Conducted #3 Phase: *L3* Temperature: 22
Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %
EUT: HIGH FREQUENCY ONLINE UPS
M/N: 10kVA
Mode: LINE MODE
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	60.21	9.62	69.83	100.00	-30.17	QP	
2		0.1540	52.71	9.62	62.33	90.00	-27.67	AVG	
3		6.6660	62.82	9.88	72.70	86.79	-14.09	QP	
4		6.6660	49.18	9.88	59.06	76.79	-17.73	AVG	
5		7.6260	62.91	10.32	73.23	85.29	-12.06	QP	
6		7.6260	49.41	10.32	59.73	75.29	-15.56	AVG	
7		14.8500	53.03	12.97	66.00	77.85	-11.85	QP	
8		14.8500	43.38	12.97	56.35	67.85	-11.50	AVG	
9		23.9380	49.30	14.79	64.09	72.52	-8.43	QP	
10		23.9380	40.47	14.79	55.26	62.52	-7.26	AVG	
11	*	29.3020	50.05	15.86	65.91	70.26	-4.35	QP	
12		29.3020	39.15	15.86	55.01	60.26	-5.25	AVG	

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



Site Conducted #3 Phase: N Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

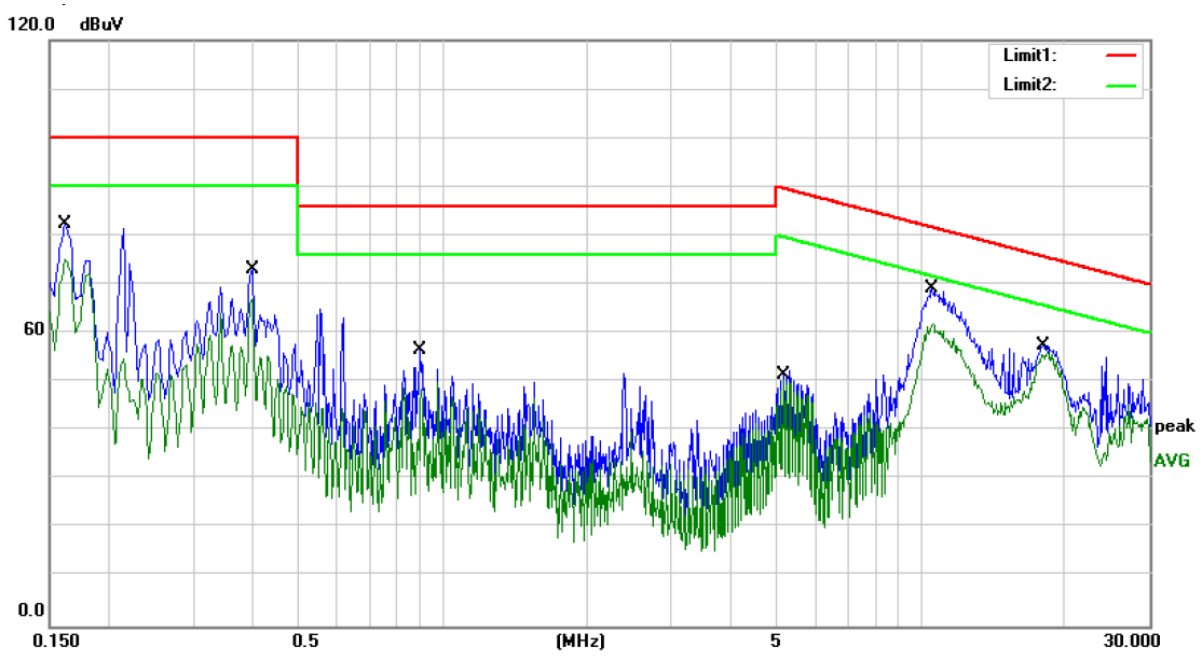
M/N: 10kVA

Mode: LINE MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		5.3380	60.39	9.87	70.26	89.27	-19.01	QP	
2		5.3380	53.19	9.87	63.06	79.27	-16.21	AVG	
3		6.5300	60.07	9.88	69.95	87.02	-17.07	QP	
4		6.5300	52.56	9.88	62.44	77.02	-14.58	AVG	
5		8.0100	59.02	10.59	69.61	84.74	-15.13	QP	
6		8.0100	51.48	10.59	62.07	74.74	-12.67	AVG	
7		11.0220	52.84	12.20	65.04	81.18	-16.14	QP	
8		11.0220	47.59	12.20	59.79	71.18	-11.39	AVG	
9		11.0220	43.70	12.20	55.90	71.18	-15.28	AVG	
10		15.0220	51.26	13.00	64.26	77.72	-13.46	QP	
11	*	29.8300	49.61	15.97	65.58	70.06	-4.48	QP	
12		29.8300	39.29	15.97	55.26	60.06	-4.80	AVG	

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



Site Conducted #3 Phase: *L1* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

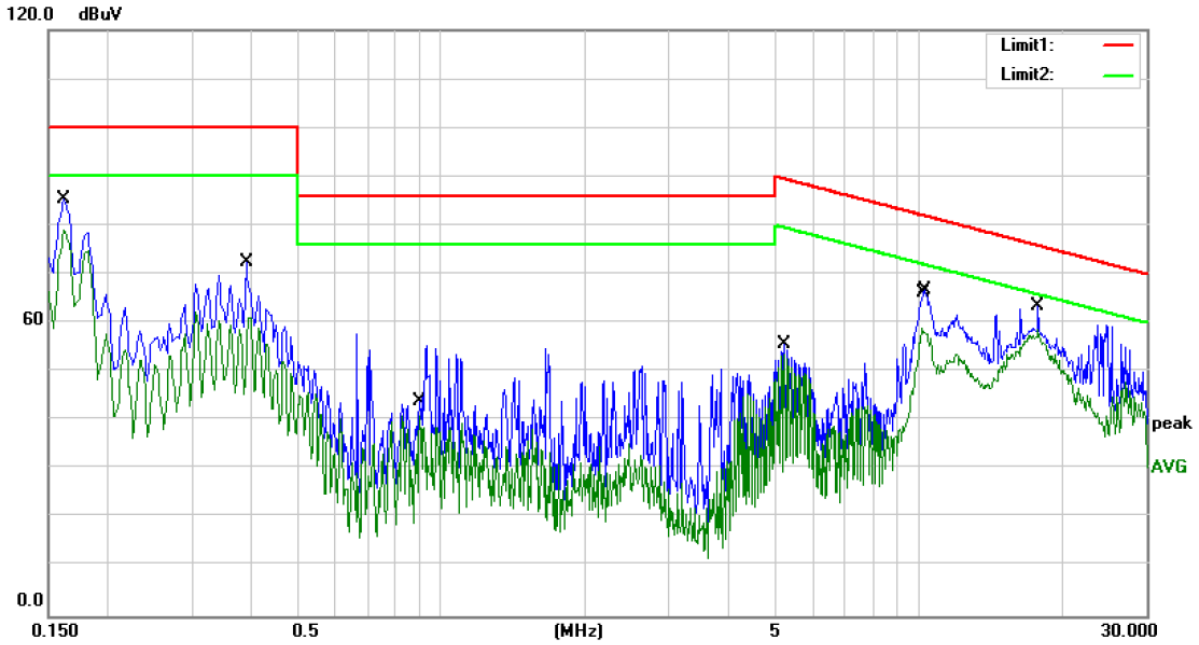
M/N: 30kVA

Mode: BAT MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	71.70	10.57	82.27	100.00	-17.73	QP	
2		0.1620	64.65	10.57	75.22	90.00	-14.78	AVG	
3		0.3980	62.44	10.57	73.01	100.00	-26.99	QP	
4		0.3980	56.48	10.57	67.05	90.00	-22.95	AVG	
5		0.8980	45.90	10.57	56.47	86.00	-29.53	QP	
6		0.8980	39.35	10.57	49.92	76.00	-26.08	AVG	
7		5.1580	41.57	10.70	52.27	89.65	-37.38	QP	
8		5.1580	39.78	10.70	50.48	79.65	-29.17	AVG	
9		10.5580	58.38	10.84	69.22	81.66	-12.44	QP	
10		10.5580	51.17	10.84	62.01	71.66	-9.65	AVG	
11		17.9500	46.59	10.89	57.48	75.73	-18.25	QP	
12	*	17.9500	45.48	10.89	56.37	65.73	-9.36	AVG	

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



Site Conducted #3 Phase: *L2* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

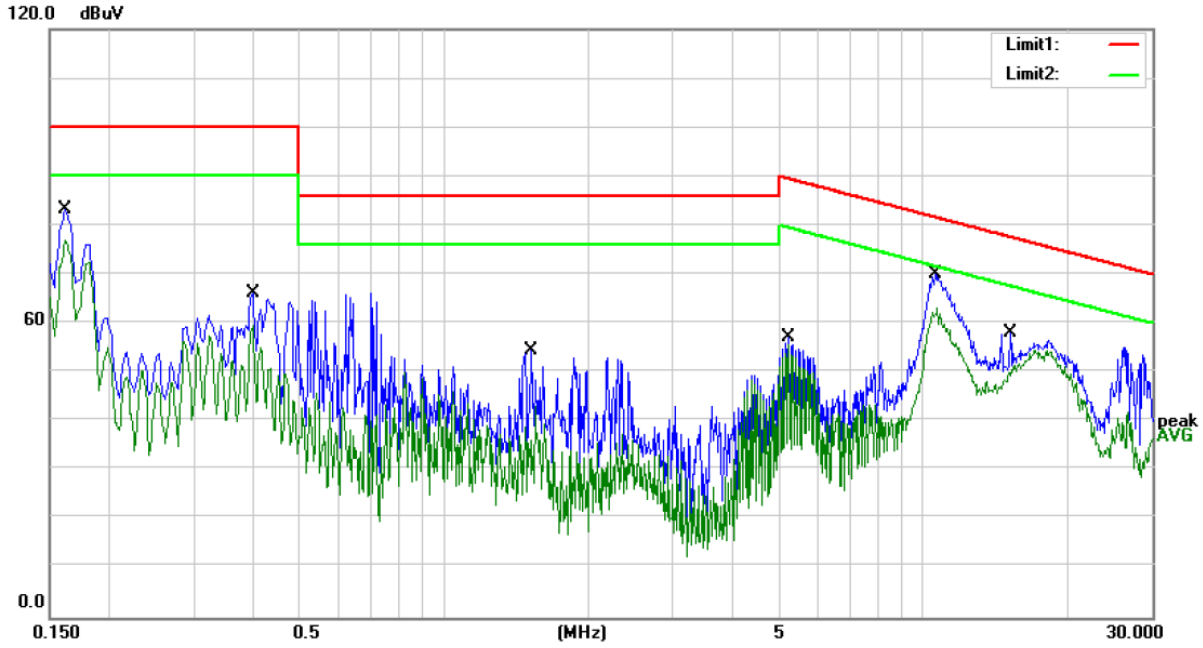
M/N: 30kVA

Mode: BAT MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	74.71	10.57	85.28	100.00	-14.72	QP	
2		0.1620	68.51	10.57	79.08	90.00	-10.92	AVG	
3		0.3900	61.81	10.57	72.38	100.00	-27.62	QP	
4		0.3900	50.45	10.57	61.02	90.00	-28.98	AVG	
5		0.9020	44.76	10.57	55.33	86.00	-30.67	QP	
6		0.9020	30.52	10.57	41.09	76.00	-34.91	AVG	
7		5.2220	44.88	10.71	55.59	89.52	-33.93	QP	
8		5.2220	42.97	10.71	53.68	79.52	-25.84	AVG	
9		10.1740	48.21	10.84	59.05	72.07	-13.02	AVG	
10		10.3100	55.90	10.84	66.74	81.92	-15.18	QP	
11		17.8180	52.62	10.89	63.51	75.82	-12.31	QP	
12	*	17.8180	47.78	10.89	58.67	65.82	-7.15	AVG	

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



Site Conducted #3 Phase: *L3* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

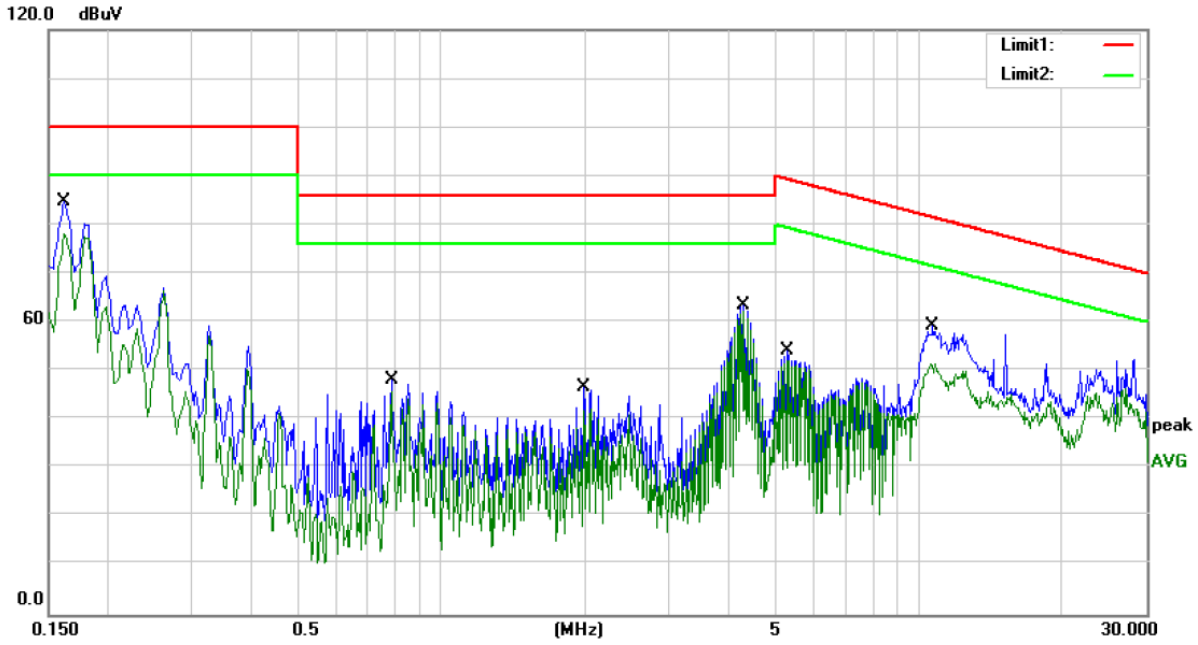
M/N: 30kVA

Mode: BAT MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	72.74	10.57	83.31	100.00	-16.69	QP	
2		0.1620	66.26	10.57	76.83	90.00	-13.17	AVG	
3		0.3980	55.72	10.57	66.29	100.00	-33.71	QP	
4		0.3980	49.06	10.57	59.63	90.00	-30.37	AVG	
5		1.5220	43.90	10.60	54.50	86.00	-31.50	QP	
6		1.5220	32.53	10.60	43.13	76.00	-32.87	AVG	
7		5.2220	46.48	10.71	57.19	89.52	-32.33	QP	
8		5.2220	44.91	10.71	55.62	79.52	-23.90	AVG	
9		10.5660	59.07	10.84	69.91	81.65	-11.74	QP	
10	*	10.5660	52.16	10.84	63.00	71.65	-8.65	AVG	
11		15.2060	47.22	10.87	58.09	77.58	-19.49	QP	
12		15.2060	43.66	10.87	54.53	67.58	-13.05	AVG	

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



Site Conducted #3 Phase: N Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

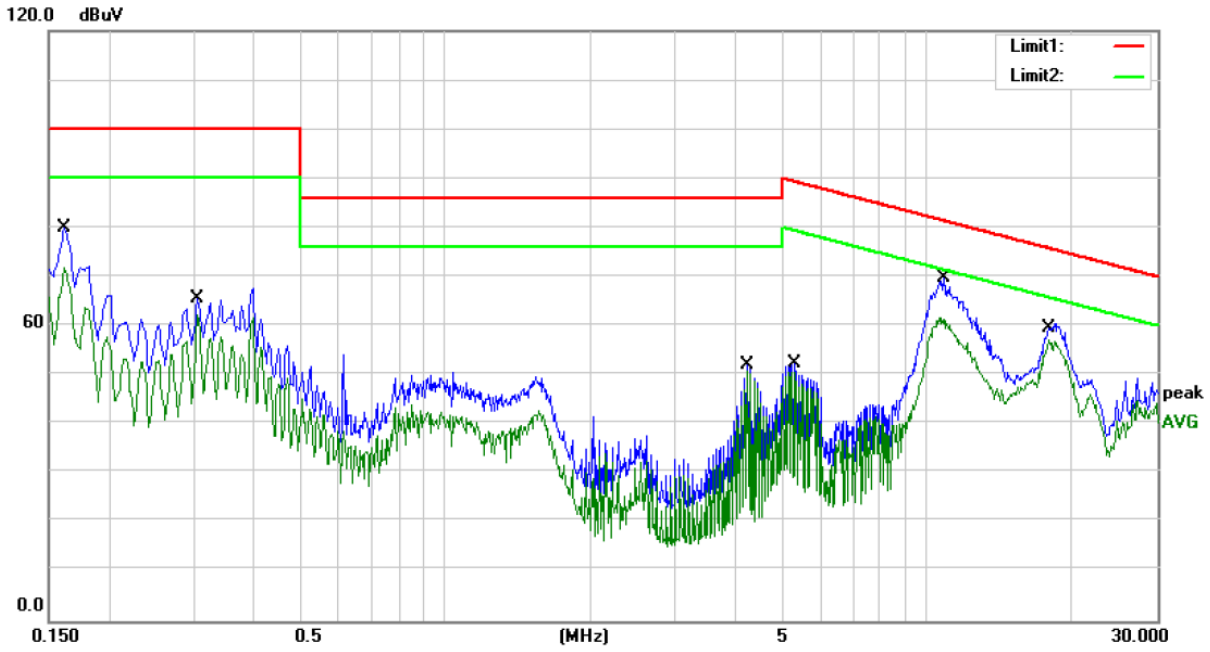
M/N: 30kVA

Mode: BAT MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	74.23	10.57	84.80	100.00	-15.20	QP	
2	*	0.1620	67.51	10.57	78.08	90.00	-11.92	AVG	
3		0.7860	37.72	10.57	48.29	86.00	-37.71	QP	
4		0.7860	35.03	10.57	45.60	76.00	-30.40	AVG	
5		1.9900	35.91	10.62	46.53	86.00	-39.47	QP	
6		1.9900	31.46	10.62	42.08	76.00	-33.92	AVG	
7		4.3100	52.65	10.69	63.34	86.00	-22.66	QP	
8		4.3100	51.58	10.69	62.27	76.00	-13.73	AVG	
9		5.2900	43.40	10.71	54.11	89.37	-35.26	QP	
10		5.2900	41.45	10.71	52.16	79.37	-27.21	AVG	
11		10.5660	48.43	10.84	59.27	81.65	-22.38	QP	
12		10.5660	40.61	10.84	51.45	71.65	-20.20	AVG	

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



Site Conducted #3 Phase: *L1* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

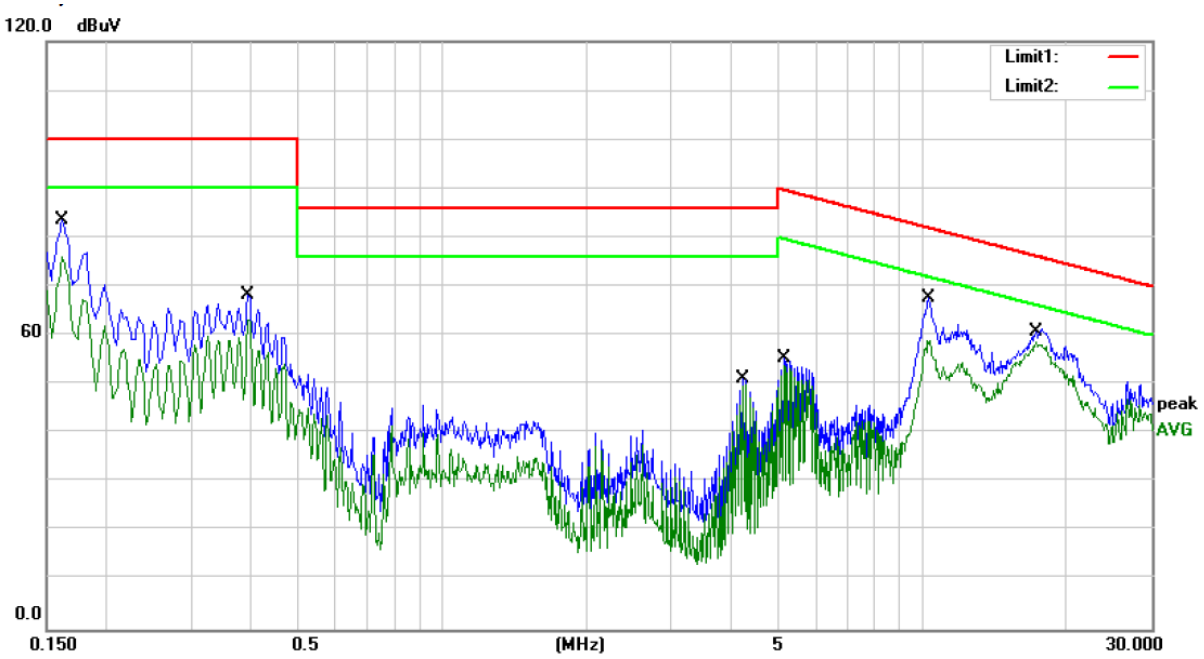
M/N: 30kVA

Mode: LINE MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	69.48	10.57	80.05	100.00	-19.95	QP	
2		0.1620	61.21	10.57	71.78	90.00	-18.22	AVG	
3		0.3060	57.13	10.57	67.70	100.00	-32.30	QP	
4		0.3060	51.69	10.57	62.26	90.00	-27.74	AVG	
5		4.2420	41.35	10.69	52.04	86.00	-33.96	QP	
6		4.2420	40.01	10.69	50.70	76.00	-25.30	AVG	
7		5.2860	41.53	10.71	52.24	89.38	-37.14	QP	
8		5.2860	39.96	10.71	50.67	79.38	-28.71	AVG	
9		10.6980	58.95	10.84	69.79	81.51	-11.72	QP	
10		10.6980	50.79	10.84	61.63	71.51	-9.88	AVG	
11		17.8740	49.62	10.89	60.51	75.78	-15.27	QP	
12	*	17.8740	46.14	10.89	57.03	65.78	-8.75	AVG	

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



Site Conducted #3 Phase: *L2* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

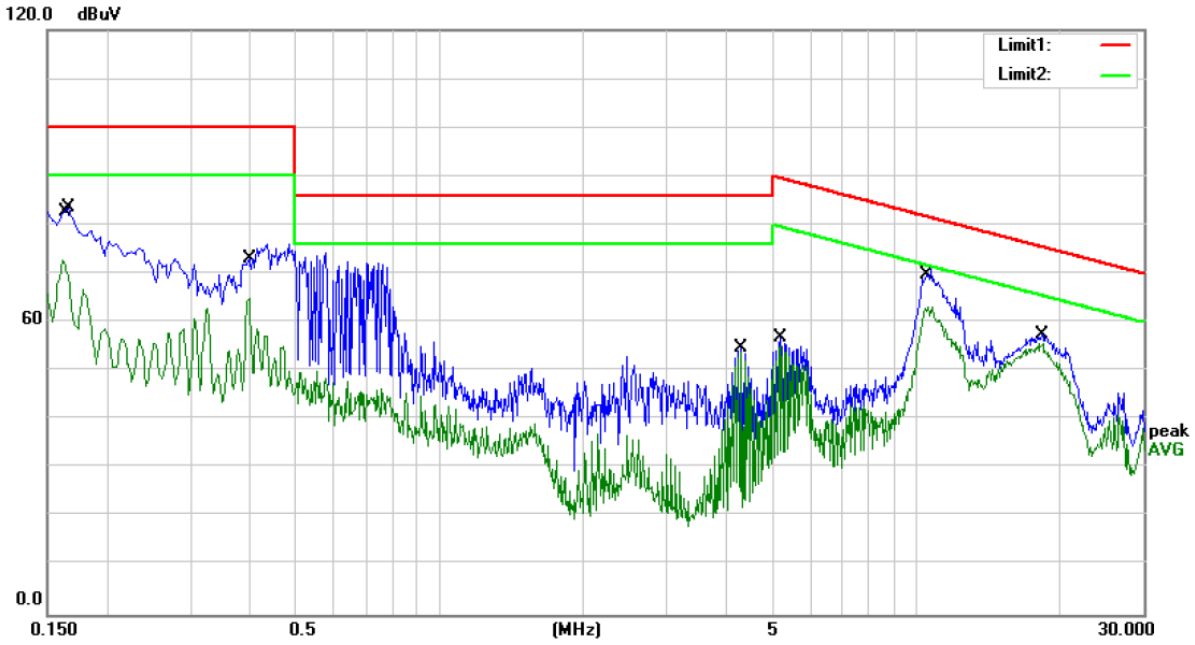
M/N: 30kVA

Mode: LINE MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	72.94	10.57	83.51	100.00	-16.49	QP	
2		0.1620	65.43	10.57	76.00	90.00	-14.00	AVG	
3		0.3940	57.75	10.57	68.32	100.00	-31.68	QP	
4		0.3940	52.56	10.57	63.13	90.00	-26.87	AVG	
5		4.2420	40.51	10.69	51.20	86.00	-34.80	QP	
6		4.2420	39.14	10.69	49.83	76.00	-26.17	AVG	
7		5.1540	44.66	10.70	55.36	89.66	-34.30	QP	
8		5.1540	43.12	10.70	53.82	79.66	-25.84	AVG	
9		10.3300	56.76	10.84	67.60	81.90	-14.30	QP	
10		10.3300	48.06	10.84	58.90	71.90	-13.00	AVG	
11		17.2180	50.38	10.88	61.26	76.20	-14.94	QP	
12	*	17.2180	47.74	10.88	58.62	66.20	-7.58	AVG	

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



Site Conducted #3 Phase: *L3* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

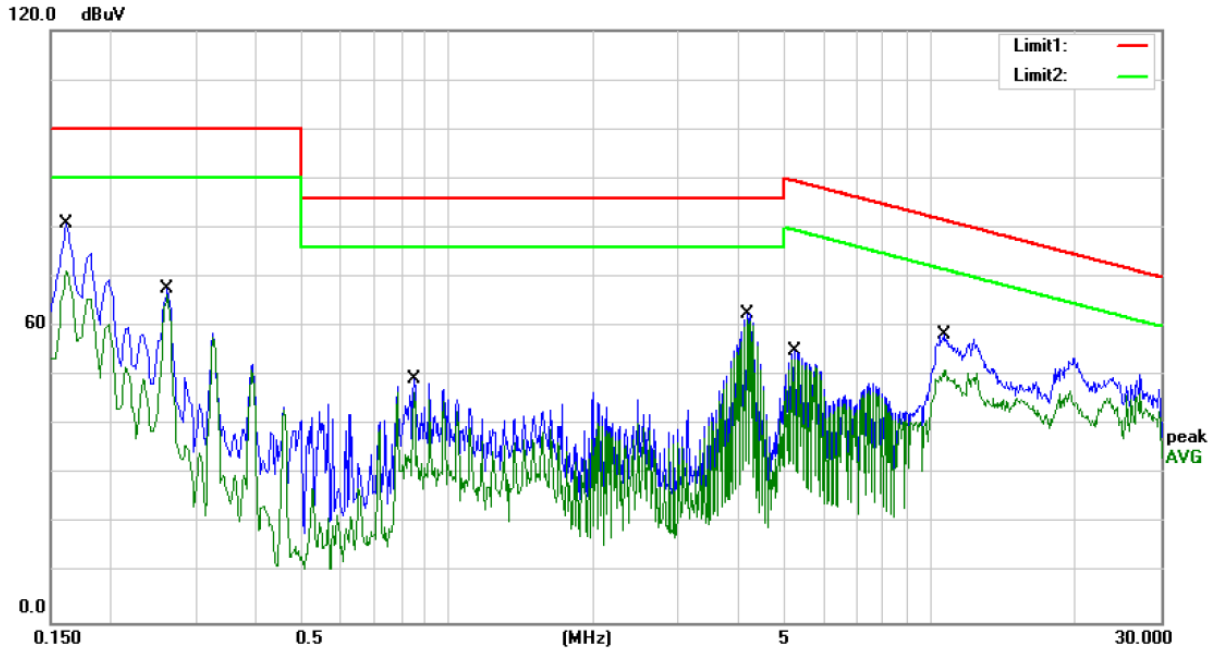
M/N: 30kVA

Mode: LINE MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	62.26	10.57	72.83	90.00	-17.17	AVG	
2		0.1660	72.93	10.57	83.50	100.00	-16.50	QP	
3		0.3980	65.57	10.57	76.14	100.00	-23.86	QP	
4		0.3980	54.40	10.57	64.97	90.00	-25.03	AVG	
5		4.3060	44.13	10.69	54.82	86.00	-31.18	QP	
6		4.3060	43.18	10.69	53.87	76.00	-22.13	AVG	
7		5.2180	46.16	10.71	56.87	89.52	-32.65	QP	
8		5.2180	44.34	10.71	55.05	79.52	-24.47	AVG	
9		10.6060	60.21	10.84	71.05	81.61	-10.56	QP	
10	*	10.6060	52.22	10.84	63.06	71.61	-8.55	AVG	
11		18.1940	46.66	10.89	57.55	75.58	-18.03	QP	
12		18.1940	44.69	10.89	55.58	65.58	-10.00	AVG	

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



Site Conducted #3 Phase: *N* Temperature: 22

Limit: (CE)EN62040-2 (16-100A)QP Power: AC 380V/50Hz Humidity: 50 %

EUT: HIGH FREQUENCY ONLINE UPS

M/N: 30kVA

Mode: LINE MODE

Note: 33K LOAD

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	70.30	10.57	80.87	100.00	-19.13	QP	
2		0.1620	60.71	10.57	71.28	90.00	-18.72	AVG	
3		0.2620	56.93	10.57	67.50	100.00	-32.50	QP	
4		0.2620	55.94	10.57	66.51	90.00	-23.49	AVG	
5		0.8500	38.84	10.57	49.41	86.00	-36.59	QP	
6		0.8500	36.08	10.57	46.65	76.00	-29.35	AVG	
7		4.1780	51.92	10.69	62.61	86.00	-23.39	QP	
8	*	4.1780	50.66	10.69	61.35	76.00	-14.65	AVG	
9		5.2220	44.19	10.71	54.90	89.52	-34.62	QP	
10		5.2220	42.69	10.71	53.40	79.52	-26.12	AVG	
11		10.7140	47.56	10.84	58.40	81.49	-23.09	QP	
12		10.7140	40.32	10.84	51.16	71.49	-20.33	AVG	

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

5. RADIATED EMISSION MEASUREMENT

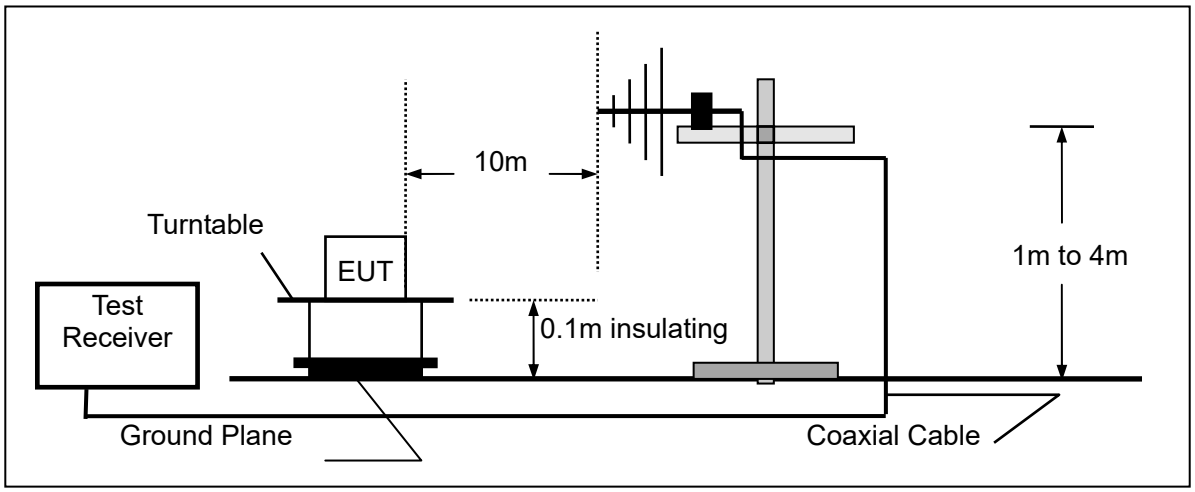
5.1. Block Diagram of Test

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: HIGH FREQUENCY ONLINE UPS)

5.1.2. Block diagram of test setup (In chamber)



(EUT: HIGH FREQUENCY ONLINE UPS)

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 (dBμV/m)
30 ~ 230	10	50
230 ~ 1000	10	57

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, Battery mode) and measure it.

5.6. Test Procedure

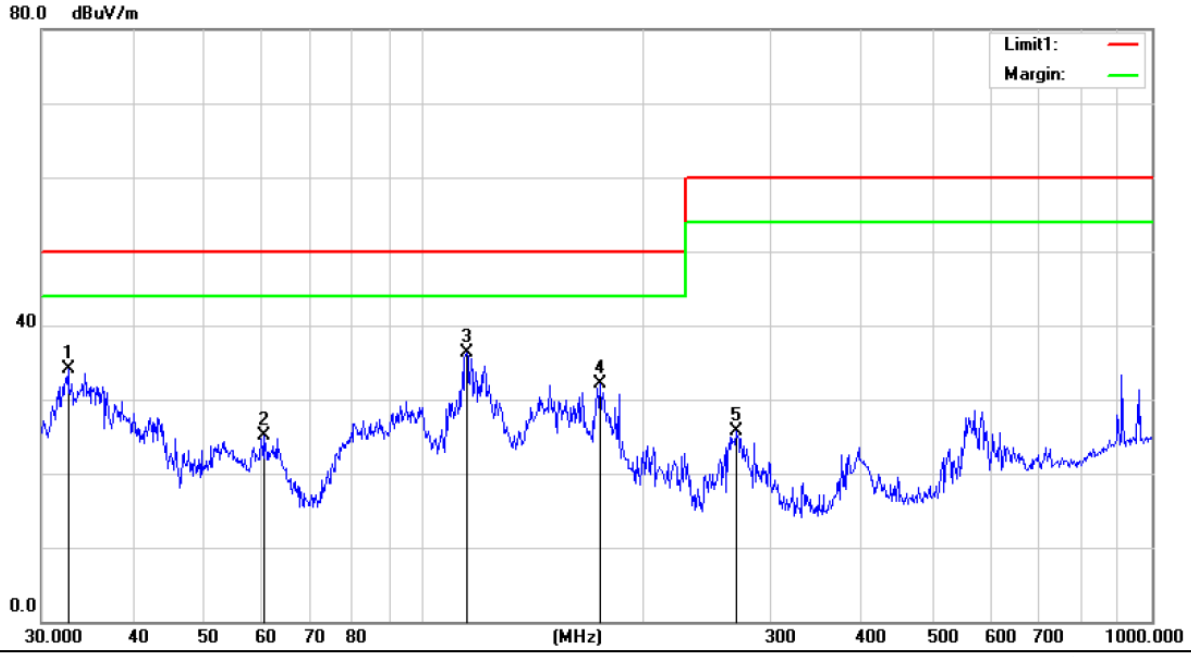
The EUT is placed on a turn table which is 0.1 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 10 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down 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.

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 %

EUT: HIGH FREQUENCY ONLINE UPS

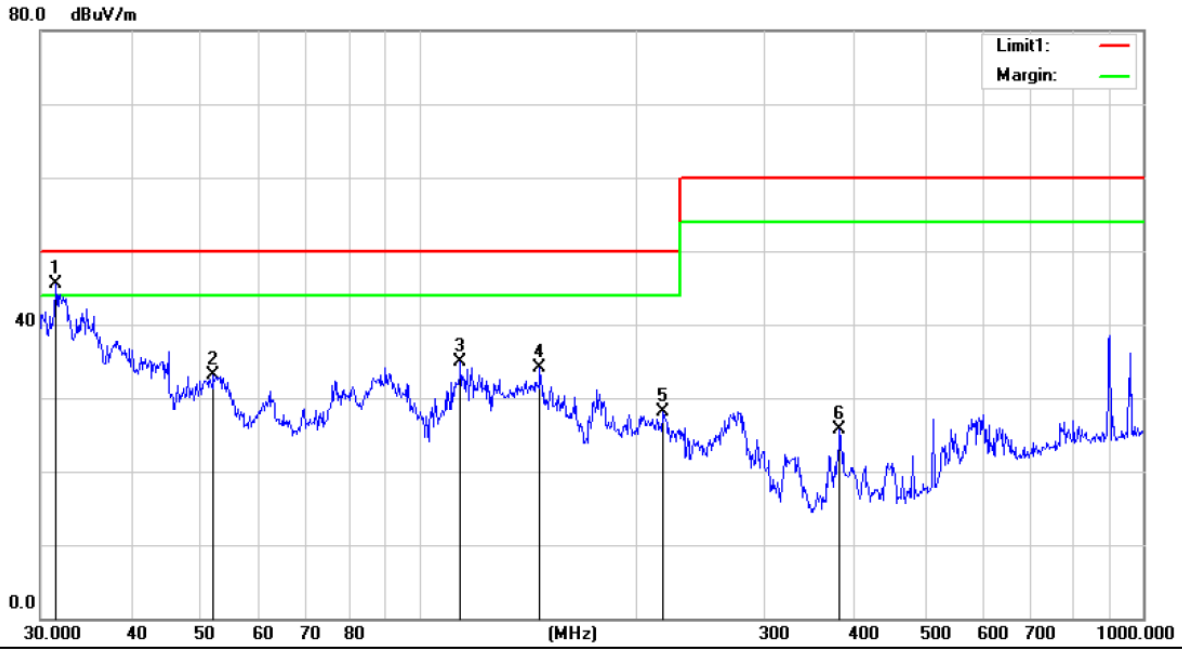
M/N: 10kVA

Mode:FULL LOAD

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		32.6340	65.14	-31.04	34.10	50.00	-15.90	QP	400	326	
2		60.4920	55.99	-30.92	25.07	50.00	-24.93	QP	108	254	
3	*	114.9170	67.82	-31.59	36.23	50.00	-13.77	QP	400	301	
4		175.0368	64.81	-32.67	32.14	50.00	-17.86	QP	308	305	
5		269.4284	53.40	-27.72	25.68	60.00	-34.32	QP	208	277	

*: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 %

EUT: HIGH FREQUENCY ONLINE UPS

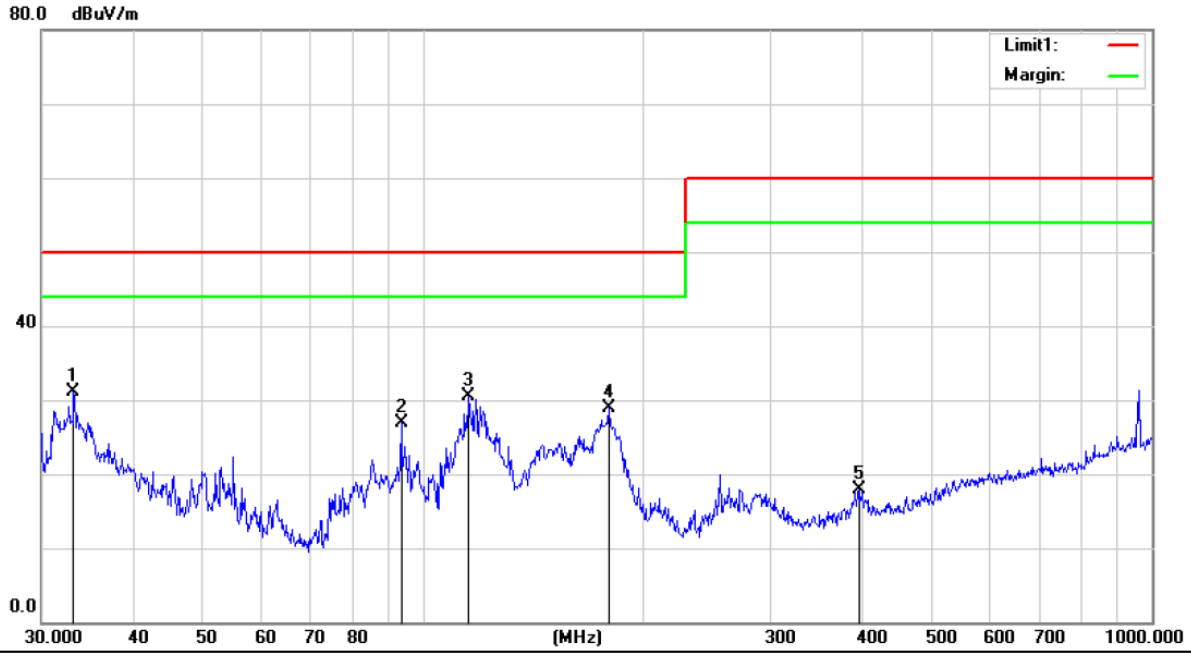
M/N: 10kVA

Mode: FULL LOAD

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	31.5095	76.87	-31.44	45.43	50.00	-4.57	QP	100	262	
2		52.0251	62.09	-28.94	33.15	50.00	-16.85	QP	399	46	
3		114.1138	65.67	-30.81	34.86	50.00	-15.14	QP	299	185	
4		146.8877	67.82	-33.77	34.05	50.00	-15.95	QP	100	178	
5		217.5443	56.78	-28.77	28.01	50.00	-21.99	QP	299	34	
6		381.2487	49.52	-23.79	25.73	60.00	-34.27	QP	100	153	

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



Site :10m Chamber #1 Polarization: *Horizontal* Temperature: 26

Limit: (RE 10M)EN62040-2 C3 Power: AC 380V/50Hz Humidity: 60 %

EUT: HIGH FREQUENCY ONLINE UPS

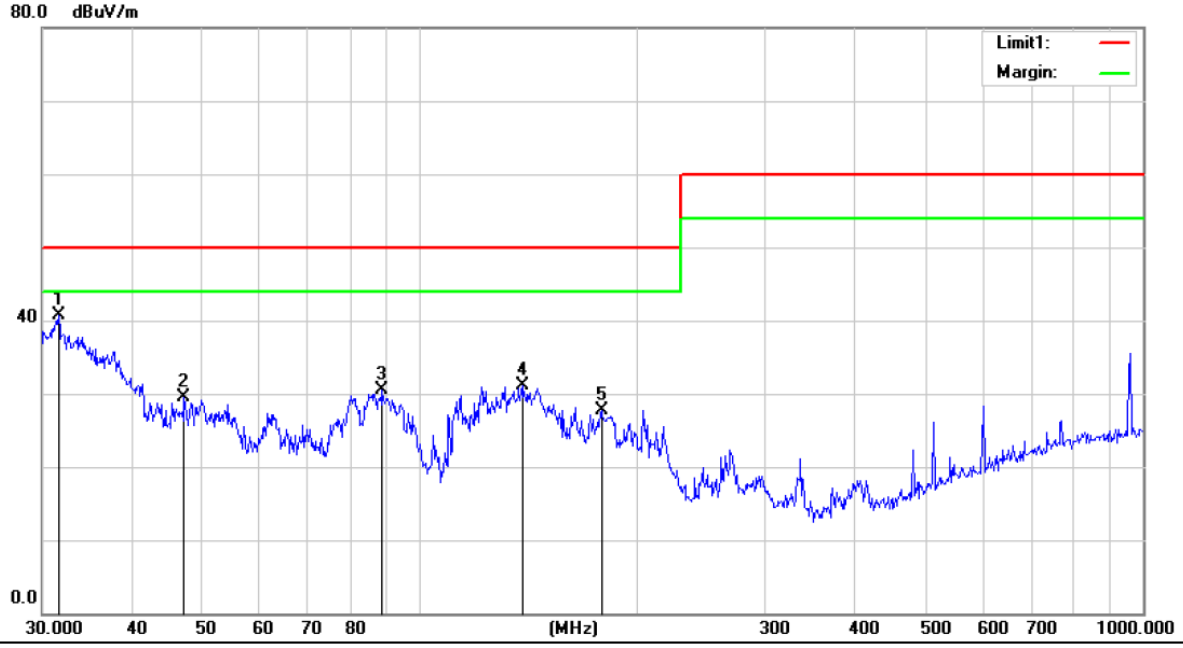
M/N: 10kVA

Mode: BAT LOAD

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	33.2112	62.01	-30.95	31.06	50.00	-18.94	QP	400	282	
2		93.4402	59.22	-32.24	26.98	50.00	-23.02	QP	400	304	
3		115.7256	62.30	-31.76	30.54	50.00	-19.46	QP	400	120	
4		180.0165	61.41	-32.45	28.96	50.00	-21.04	QP	400	326	
5		396.2415	41.60	-23.70	17.90	60.00	-42.10	QP	400	210	

*: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 %

EUT: HIGH FREQUENCY ONLINE UPS

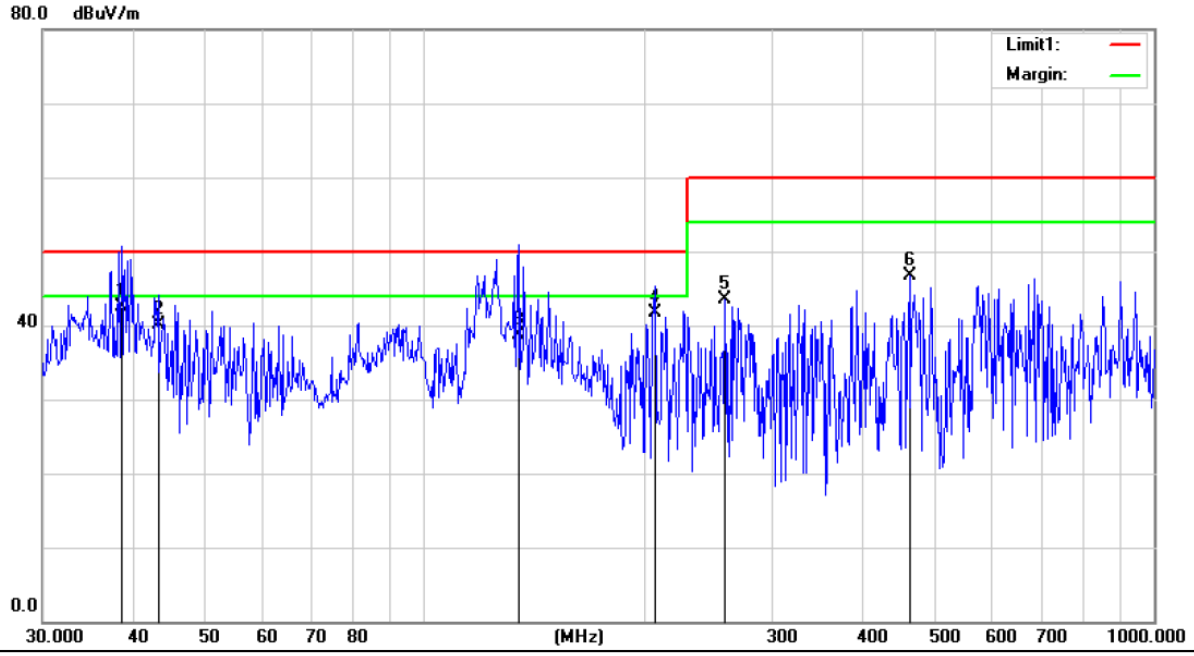
M/N: 10kVA

Mode: BAT LOAD

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	31.6202	72.03	-31.42	40.61	50.00	-9.39	QP	100	270	
2		47.1600	58.54	-29.06	29.48	50.00	-20.52	QP	100	135	
3		88.6524	62.26	-31.75	30.51	50.00	-19.49	QP	100	356	
4		138.3873	64.89	-33.87	31.02	50.00	-18.98	QP	100	221	
5		178.1327	59.95	-32.20	27.75	50.00	-22.25	QP	100	208	

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



Site :10m Chamber #1 Polarization: *Horizontal* Temperature: 26

Limit: (RE 10M)EN62040-2 C3 Power: AC 380V/50Hz Humidity: 60 %

EUT: HIGH FREQUENCY ONLINE UPS

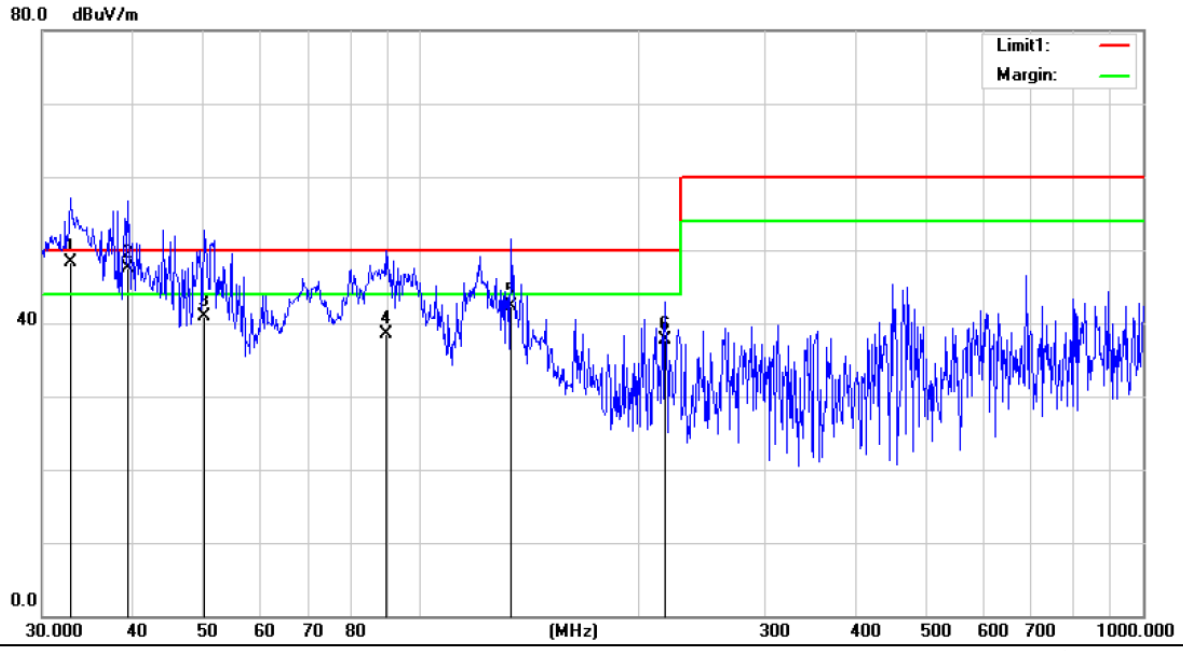
M/N: 30kVA

Mode:LINE MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	38.4808	72.68	-30.08	42.60	50.00	-7.40	QP	308	25	
2		43.2017	69.61	-29.51	40.10	50.00	-9.90	QP	308	286	
3		135.0320	72.97	-34.17	38.80	50.00	-11.20	QP	308	303	
4		207.1226	72.21	-30.51	41.70	50.00	-8.30	QP	308	162	
5		258.3263	71.50	-28.08	43.42	60.00	-16.58	QP	308	181	
6		462.3455	69.28	-22.57	46.71	60.00	-13.29	QP	308	128	

*: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 %

EUT: HIGH FREQUENCY ONLINE UPS

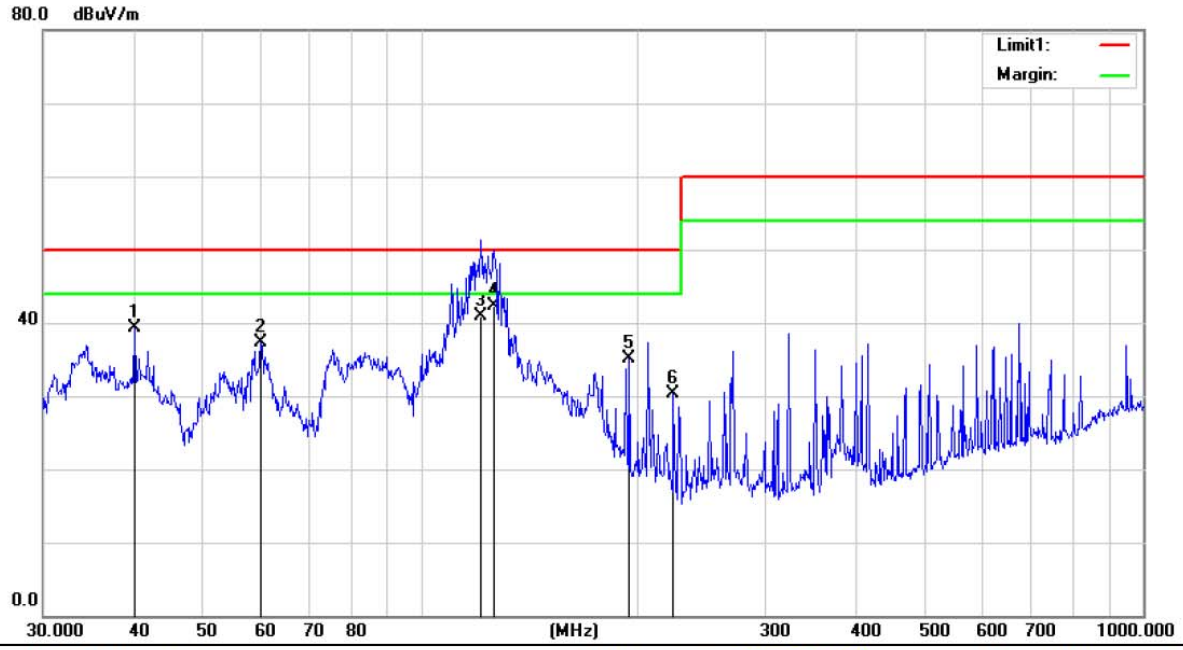
M/N: 30kVA

Mode:LINE MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	32.8637	79.47	-31.17	48.30	50.00	-1.70	QP	100	359	
2	!	39.4371	77.50	-29.90	47.60	50.00	-2.40	QP	199	0	
3		50.2324	69.68	-28.78	40.90	50.00	-9.10	QP	199	85	
4		89.5900	70.04	-31.54	38.50	50.00	-11.50	QP	199	1	
5		133.6187	75.83	-33.43	42.40	50.00	-7.60	QP	199	207	
6		218.3085	66.56	-28.76	37.80	50.00	-12.20	QP	199	0	

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



Site :10m Chamber #1 Polarization: *Horizontal* Temperature: 26

Limit: (RE 10M)EN62040-2 C3 Power: AC 380V/50Hz Humidity: 60 %

EUT: HIGH FREQUENCY ONLINE UPS

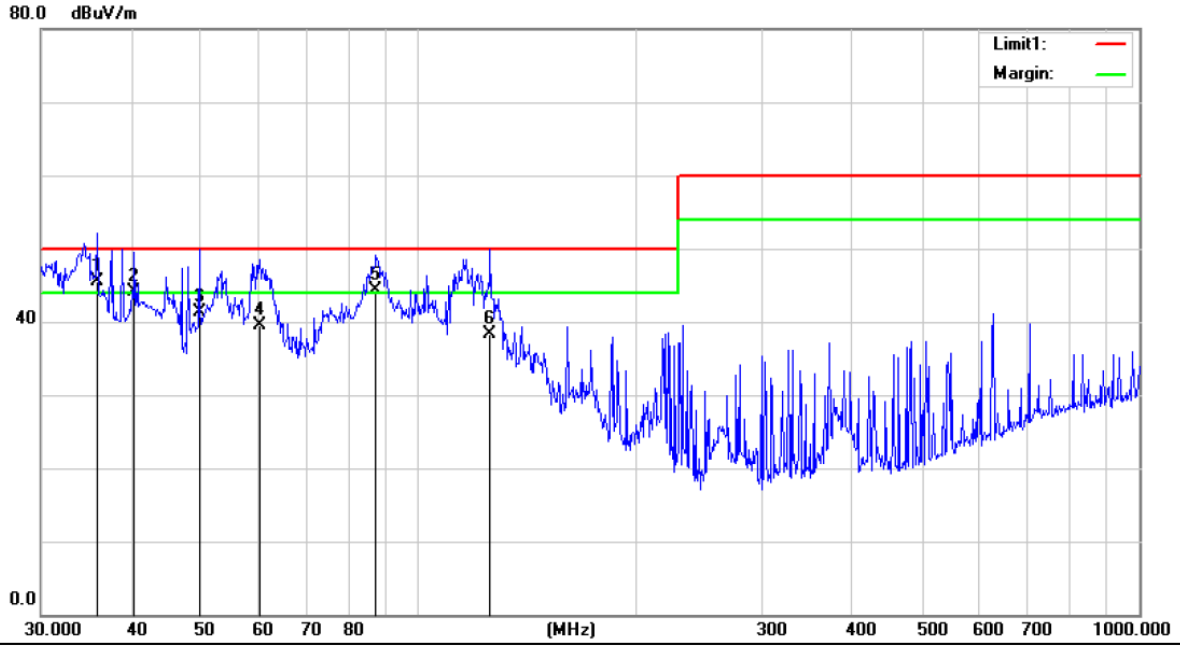
M/N: 30kVA

Mode: BAT MODE

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		40.1347	69.05	-29.83	39.22	50.00	-10.78	QP	400	288	
2		60.0691	68.10	-30.80	37.30	50.00	-12.70	QP	400	91	
3		121.1231	73.80	-32.80	41.00	50.00	-9.00	QP	400	341	
4	*	126.3286	75.75	-33.45	42.30	50.00	-7.70	QP	400	108	
5		194.4534	66.32	-31.30	35.02	50.00	-14.98	QP	400	288	
6		223.7334	60.00	-29.70	30.30	50.00	-19.70	QP	400	286	

*: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 %

EUT: HIGH FREQUENCY ONLINE UPS

M/N: 30kVA

Mode:BAT MODE

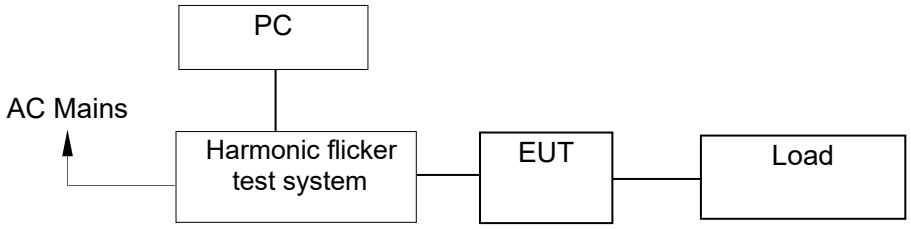
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	35.8746	76.08	-30.58	45.50	50.00	-4.50	QP	100	215	
2	!	40.4172	73.85	-29.75	44.10	50.00	-5.90	QP	100	286	
3		49.7068	70.10	-28.80	41.30	50.00	-8.70	QP	100	286	
4		60.2801	69.36	-29.76	39.60	50.00	-10.40	QP	100	89	
5	!	87.4177	76.34	-32.04	44.30	50.00	-5.70	QP	100	0	
6		125.8864	70.95	-32.55	38.40	50.00	-11.60	QP	100	16	

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

6. HARMONIC CURRENT EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



(EUT: HIGH FREQUENCY ONLINE UPS)

6.2. Measuring Standard

EN 61000-3-12: 2011 CLASS A

6.3. Operation Condition of EUT

6.3.1.Setup the EUT as shown on Section 6.1.

6.3.2.Turn on the power of all equipments.

6.3.3.Let the EUT work in measuring mode (Line Mode) and measure it.

6.4. Measuring Results

Pass.

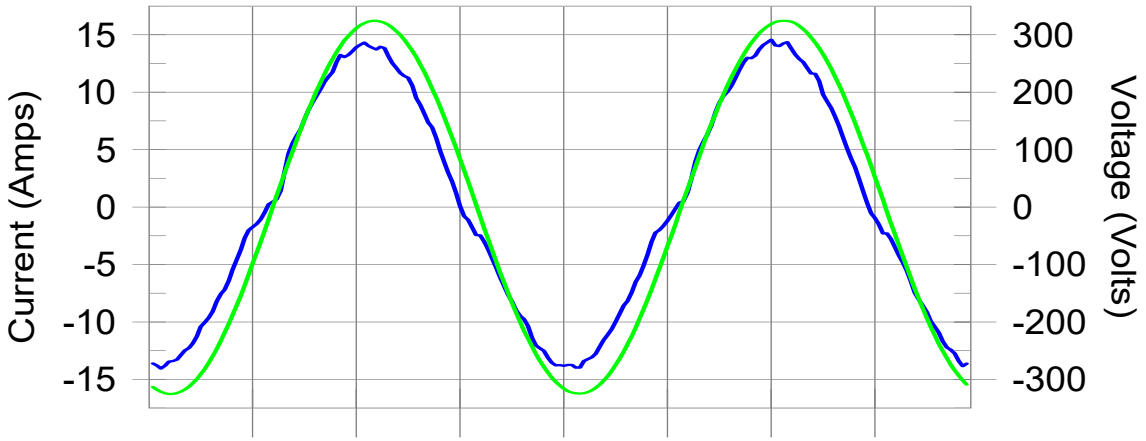
Please refer to the following pages.

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

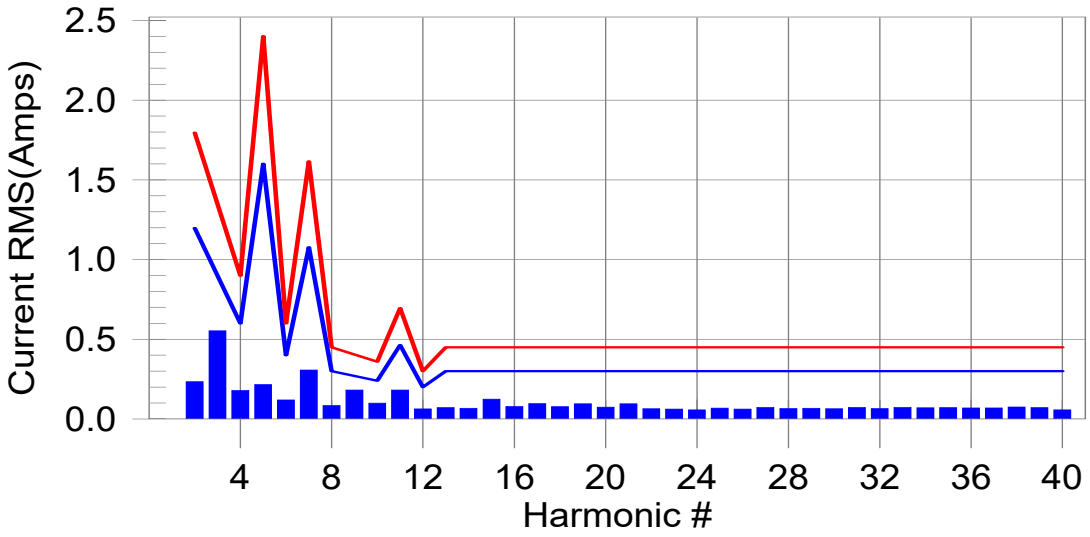
EUT: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 Start time: 9:38:03 End time: 9:40:56
Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
Comment: LINE MODE
Customer: EAST

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: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 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: EAST

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: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 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: EAST

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

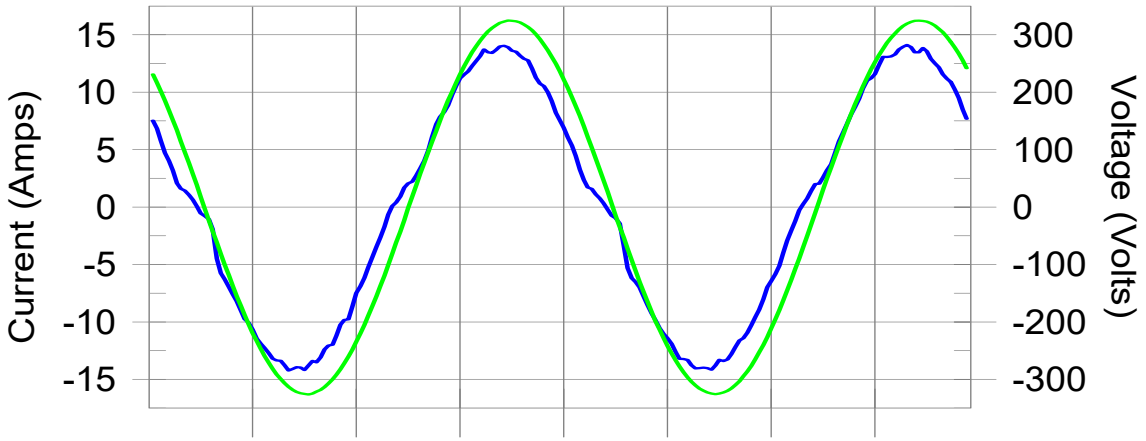
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.315	0.918	34.34	OK
3	0.227	2.868	7.93	OK
4	0.104	0.918	11.32	OK
5	0.102	3.441	2.96	OK
6	0.076	0.918	8.23	OK
7	0.169	2.868	5.91	OK
8	0.089	0.917	9.71	OK
9	0.102	1.376	7.43	OK
10	0.125	0.918	13.66	OK
11	0.218	1.606	13.55	OK
12	0.109	0.688	15.89	OK
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)

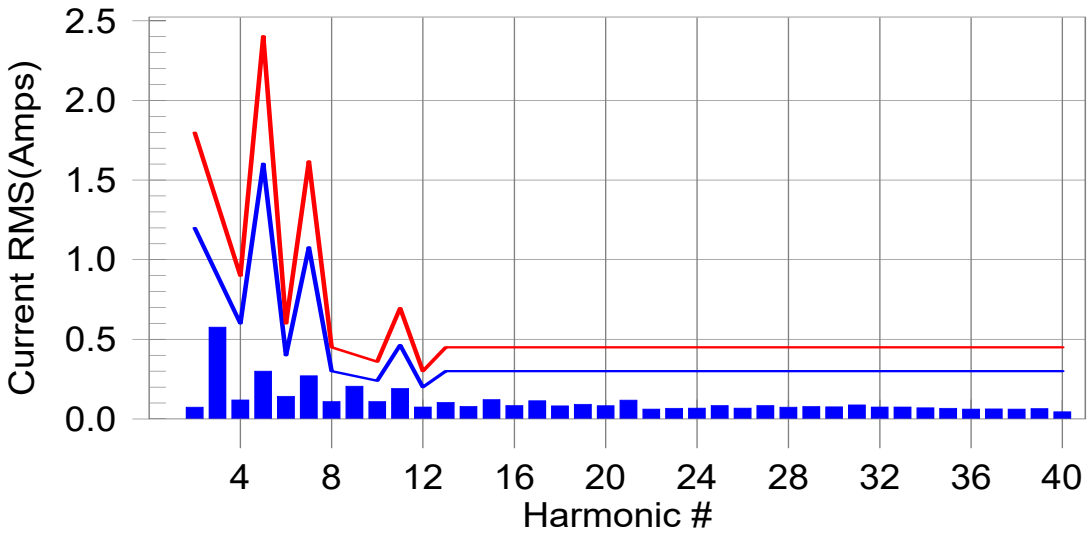
EUT: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 Start time: 9:38:03 End time: 9:40:56
Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
Comment: LINE MODE
Customer: EAST

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: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 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: EAST

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: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 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: EAST

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

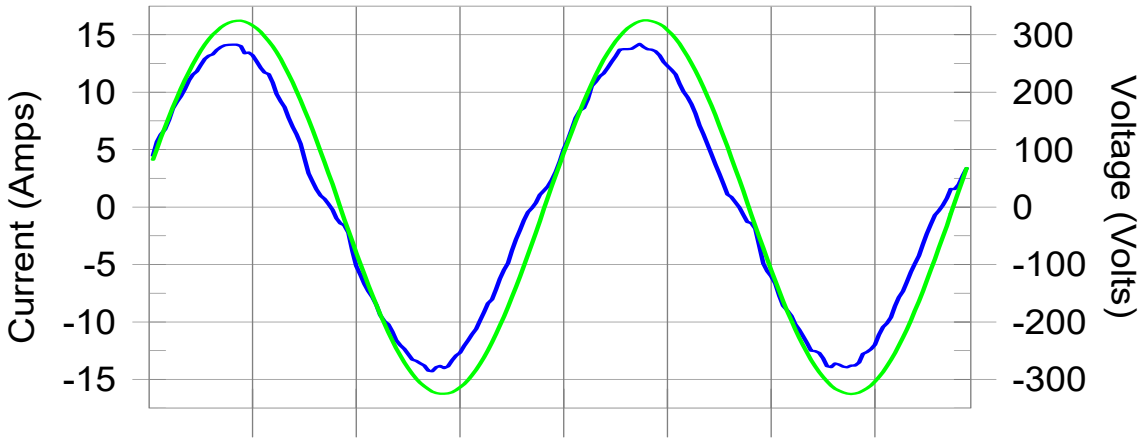
Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.317	0.918	34.55	OK
3	0.192	2.868	6.70	OK
4	0.065	0.918	7.12	OK
5	0.085	3.444	2.48	OK
6	0.058	0.918	6.27	OK
7	0.132	2.870	4.60	OK
8	0.079	0.918	8.61	OK
9	0.093	1.377	6.78	OK
10	0.101	0.918	10.96	OK
11	0.196	1.607	12.19	OK
12	0.110	0.689	15.92	OK
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)

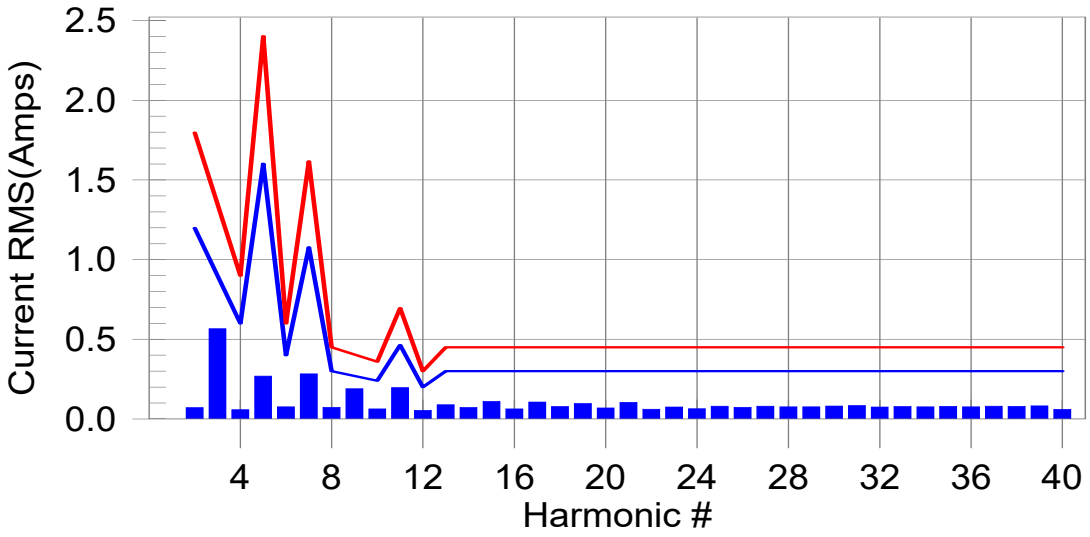
EUT: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 Start time: 9:38:03 End time: 9:40:56
Test duration (min): 2.5 Data file name: WIN2106_H-000008.cts_data
Comment: LINE MODE
Customer: EAST

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: HIGH FREQUENCY ONLINE UPS(30KVA) Tested by: YU
Test category: Table:3, Rsce=33, Inter-Harm,) Test Margin: 100
Test date: 2016/6/10 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: EAST

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.

Voltage Source Verification Data (Phase C-Run time)

EUT: HIGH FREQUENCY ONLINE UPS(30KVA) **Tested by: YU**
Test category: Table:3, Rsce=33, Inter-Harm,) **Test Margin: 100**
Test date: 2016/6/10 **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: EAST

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):	229.85	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#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.305	0.917	33.28	OK
3	0.218	2.868	7.61	OK
4	0.082	0.918	8.94	OK
5	0.097	3.443	2.83	OK
6	0.085	0.918	9.22	OK
7	0.186	2.869	6.49	OK
8	0.091	0.917	9.96	OK
9	0.129	1.376	9.38	OK
10	0.101	0.918	10.96	OK
11	0.221	1.605	13.78	OK
12	0.124	0.688	17.96	OK
13	0.122	1.376	8.84	OK
14	0.159	0.688	23.07	OK
15	0.239	0.688	34.70	OK
16	0.115	0.688	16.75	OK
17	0.266	0.688	38.71	OK
18	0.139	0.688	20.21	OK
19	0.203	0.688	29.50	OK
20	0.097	0.688	14.05	OK
21	0.314	0.688	45.61	OK
22	0.116	0.688	16.85	OK
23	0.247	0.688	35.93	OK
24	0.119	0.688	17.24	OK
25	0.234	0.688	33.94	OK
26	0.160	0.688	23.23	OK
27	0.215	0.688	31.25	OK
28	0.162	0.688	23.56	OK
29	0.170	0.688	24.63	OK
30	0.197	0.688	28.64	OK
31	0.248	0.688	36.04	OK
32	0.198	0.688	28.79	OK
33	0.211	0.688	30.72	OK
34	0.200	0.688	29.12	OK
35	0.188	0.688	27.31	OK
36	0.215	0.688	31.20	OK
37	0.213	0.688	30.90	OK
38	0.255	0.688	37.08	OK
39	0.280	0.688	40.62	OK
40	0.283	0.688	41.08	OK

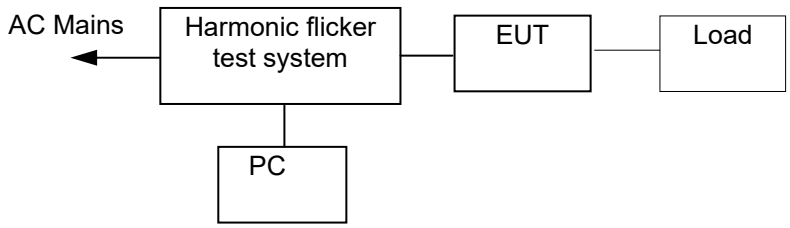
5th Harmonic Phase Angle and Magnitude for Phase A :
H-5_min_phase : 210.9 Degree (Leading)
H-5_max_phase : 297.7 Degree (Leading)
H-5_ave_phase : 233.8 Degree (Leading)

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: LED Driver)

7.2. Measuring Standard

EN 61000-3-11:2000

7.3. Operation Condition of EUT

7.3.1. Setup the EUT as shown on Section 7.1.

7.3.2. Turn on the power of all equipments.

7.3.3. Let the EUT work in measuring mode (Line Mode) and measure it.

7.4. Measuring Results

Pass.

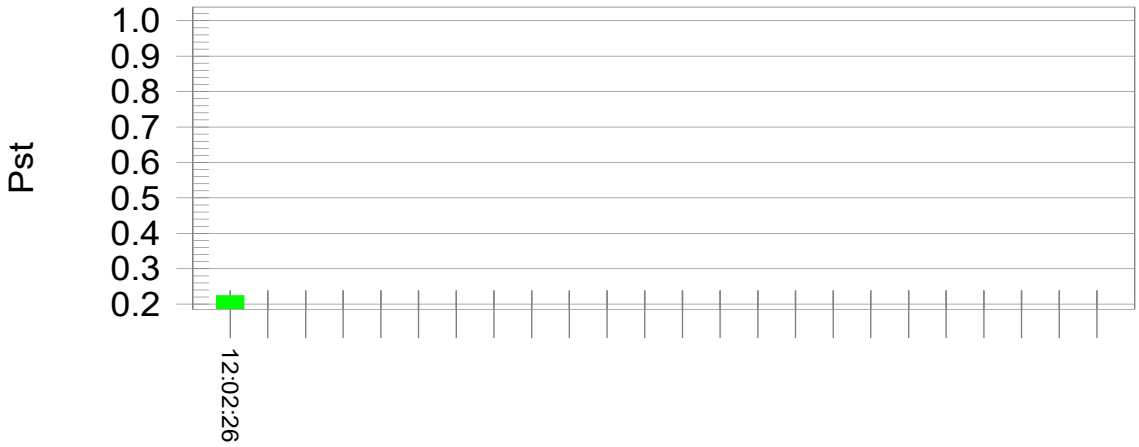
Please refer to the following pages.

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

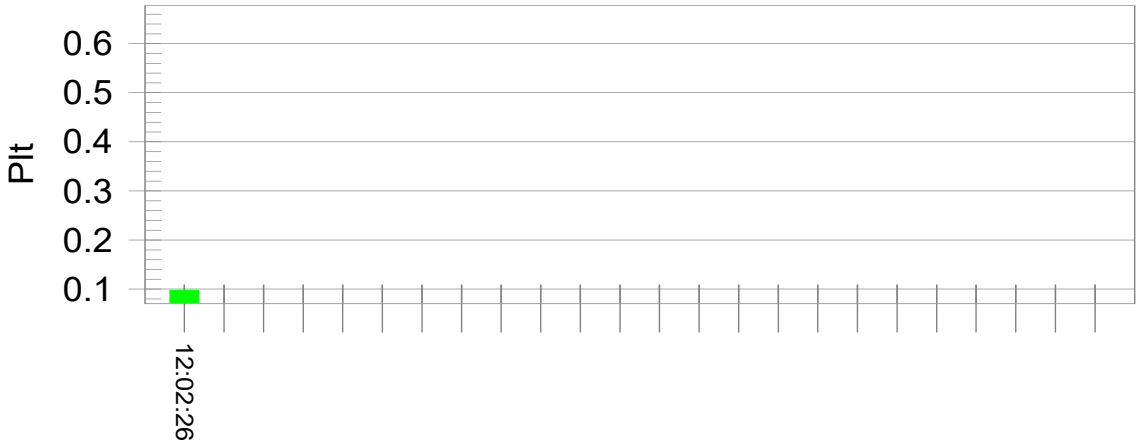
EUT: HIGH FREQUENCY ONLINE UPS(30KVA) **Tested by: YU**
Test category: All parameters **Test Margin: 100**
Test date: 2016/6/10 **Start time: 11:52:04** **End time: 12:02:27**
Test duration (min): 10 **Data file name: WIN2106_F-000080.cts_data**
Comment: LINE MODE
Customer: EAST
Z-test Phase = (0.150 + j 0.150 Ohm) Neutral = (0.100 + j 0.100 Ohm)

Test Result: Pass
Status: Test Completed

Pst_i and limit line



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 228.51

Time(mS) > dt:	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**-0.30**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**-0.45**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.224**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.098**	**Test limit:**	**0.650**	**Pass**

Calculated dmax(%): -0.596
Calculated dc(%): -0.394
Calculated Pst : 0.299
Calculated Plt : 0.131

The maximum permissible system impedance Zsys :

Z-phase A = 1.467 Ohm + j 0.917 Ohm (1.467 Ohm + 2918 H)
Z-neutral A = 0.978 Ohm + j 0.611 Ohm (0.978 Ohm + 1945 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:

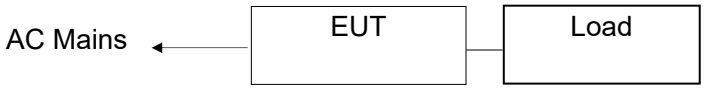
Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention.
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer’s instructions. 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

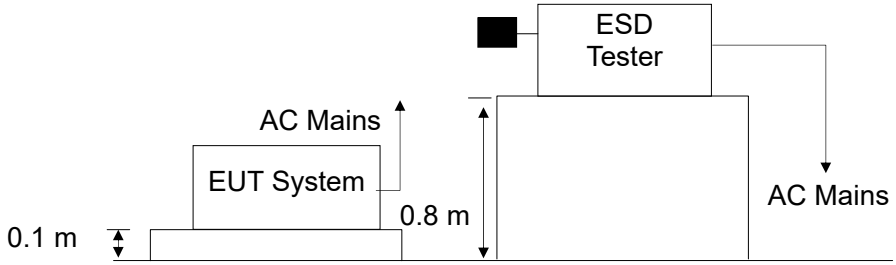
9.1. Block Diagram of Test Setup

9.1.1. Block diagram of connection between the EUT and simulators



(EUT: HIGH FREQUENCY ONLINE UPS)

9.1.2. Block diagram of ESD test setup



(EUT: HIGH FREQUENCY ONLINE UPS)

9.2. Test Standard

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

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 Supply 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 the procedure shall be 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	: EAST GROUP CO., LTD.		Test Date	:	May 07, 2016
EUT	: HIGH FREQUENCY ONLINE UPS		Temperature	:	22℃
M/N	: 30kVA		Humidity	:	50%
Power Supply	: AC 380V/50Hz		Actual Criterion	:	B
Test Mode	: Line mode, Battery mode		Air discharge	:	±8kV
Test Engineer	: ZCJ		Contact discharge	:	±4kV

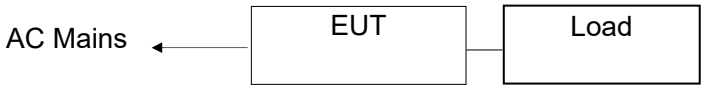
Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Screen	A	A
Screw	C	A
Slot	A	A
Metal	C	A
Port	C	A
HCP of all sides	C	A
VCP of front	C	A
VCP of rear	C	A
VCP of left	C	A
VCP of right	C	A

Test Equipment: ESD Simulator (TESEQAG, NSG 437)

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

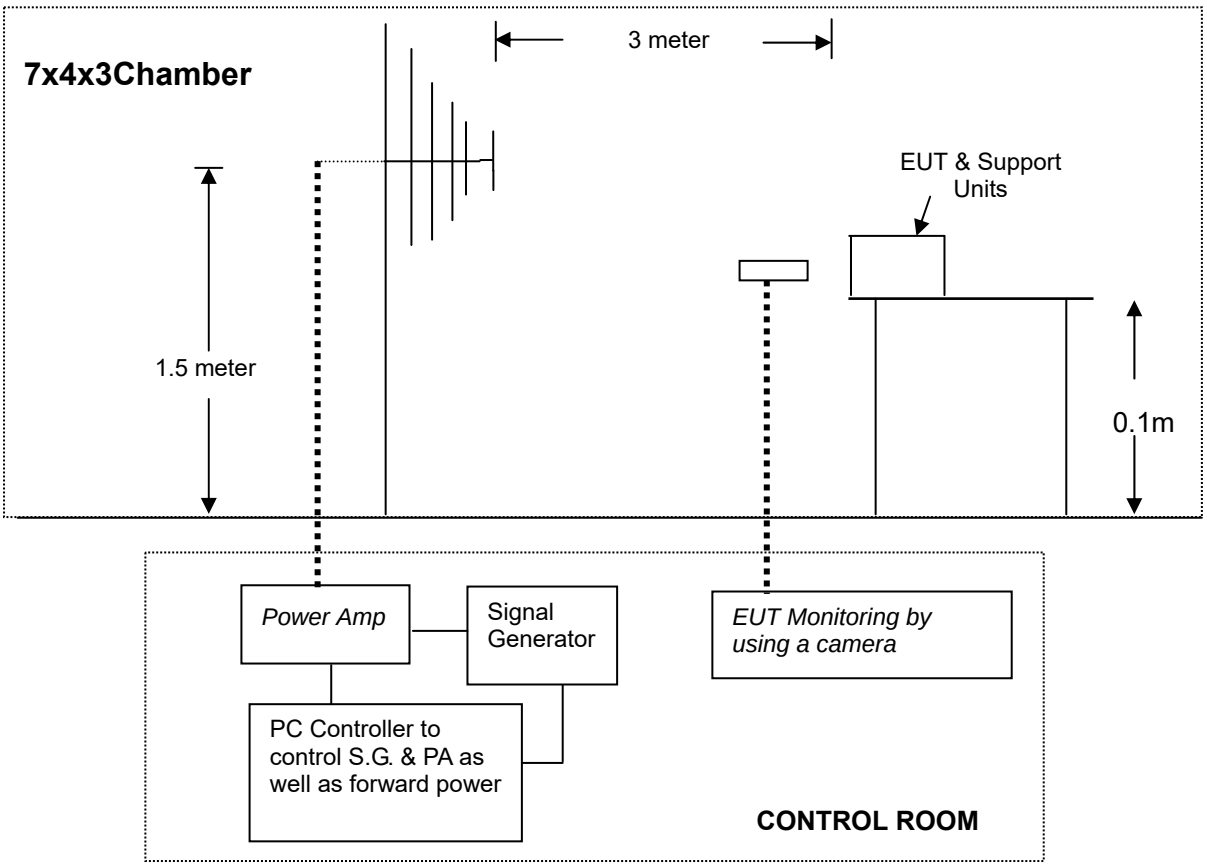
10.1.Block Diagram of Test

10.1.1.Block diagram of connection between the EUT and Load



(EUT: HIGH FREQUENCY ONLINE UPS)

10.1.2.Block diagram of RS test setup



(EUT: HIGH FREQUENCY ONLINE UPS)

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
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	: EAST GROUP CO., LTD.	Test Date	: May 07, 2016
EUT	: HIGH FREQUENCY ONLINE UPS	Temperature	: 22℃
M/N	: 30kVA	Humidity	: 50%
Field Strength	: 10V/m	Actual Criterion	: A
Power Supply	: AC 380V/50Hz	Test Mode	: Line mode, Battery mode
Test Engineer	: ZCJ	Frequency Range	: 80 to 1000 MHz

Modulation: ☐None ☐ Pulse ☑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		

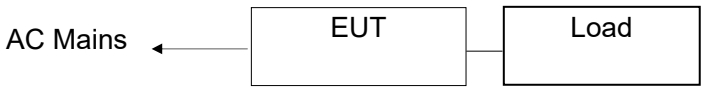
Test Equipment **:**
1. Signal Generator: N5181A (Agilent)
2. Power Amplifier: 80RF1000-175 (MILMEGA) & AS1860-50 (MILMEGA)
3. Log.-Per. Antenna: VULP 9118E (SCHWARZBECK)
4. RF Power Meter. Dual Channel: 4232A (BOONTON)
5. Field Strength Meter: RSS1006A (DARE)

Note: /

11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

11.1.Block Diagram of Test Setup

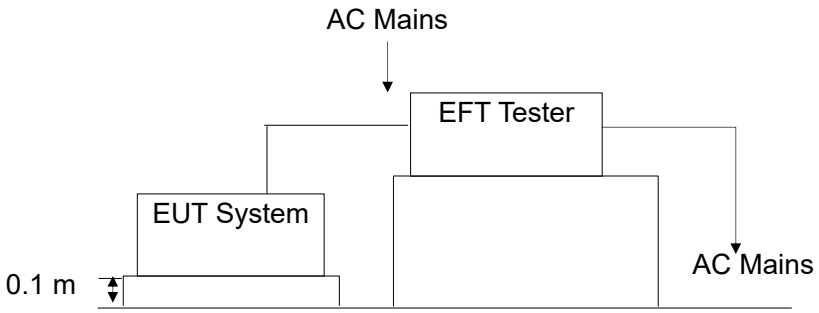
11.1.1.Block Diagram of the EUT



(EUT: HIGH FREQUENCY ONLINE UPS)

11.1.2.EFT Test Setup

AC Port:



(EUT: HIGH FREQUENCY ONLINE UPS)

11.2.Test Standard

IEC 61000-4-4:2012 (Level 3: 2kV/5kHz)

11.3.Severity Levels and Performance Criterion

11.3.1.Severity level

Open Circuit Output Test Voltage ±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 Supply 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 equipments.

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: ☒ PASS / ☐FAIL

Applicant : EAST GROUP CO., LTD.

EUT : HIGH FREQUENCY ONLINE UPS

M/N : 30kVA

Input Voltage : AC 380V/50Hz

Actual Criterion : B

Ambient Condition : 23 ℃ 55% RH

Operation Mode: Line mode

Line : ☒ AC input power ports and AC output power ports	Line : ☐ Signal ☐ I/O Cable
Coupling : ☒ Direct	Coupling : ☐ 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

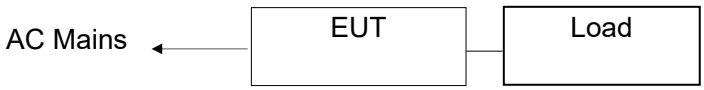
Note:

Test Equipment	Burst Tester Model : PEFT 4010

12. SURGE IMMUNITY TEST

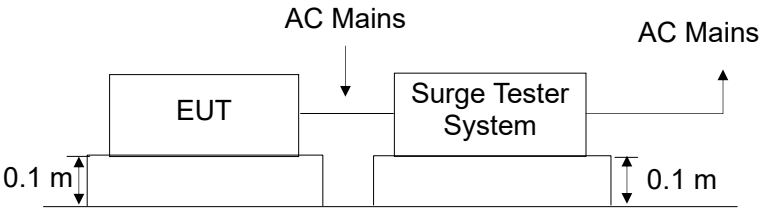
12.1.Block Diagram of Test Setup

12.1.1.Block Diagram of the EUT



(EUT: HIGH FREQUENCY ONLINE UPS)

12.1.2. Surge Test Setup



(EUT: HIGH FREQUENCY ONLINE UPS)

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 Supply 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 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 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 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 : EAST GROUP CO., LTD.
EUT : HIGH FREQUENCY ONLINE UPS
M/N : 30kVA
Power Supply : AC 380V / 50Hz
Test Mode : Line mode

Test Engineer: ZCJ
Test Date : May 07, 2016
Temperature : 23℃
Humidity : 51%
Criterion : B

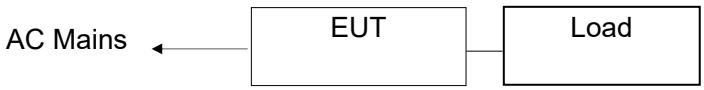
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
AC Input: L1-L2, L1-L3, L2-L3	+	0˚, 90˚, 180˚, 270˚	5	1.0	A
	-	0˚, 90˚, 180˚, 270˚	5	1.0	A
L1-N, L2-N, L3-N	+	0˚, 90˚, 180˚, 270˚	5	2.0	A
	-	0˚, 90˚, 180˚, 270˚	5	2.0	A
L1-PE, L2-PE, L3-PE	+	0˚, 90˚, 180˚, 270˚	5	2.0	A
	-	0˚, 90˚,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

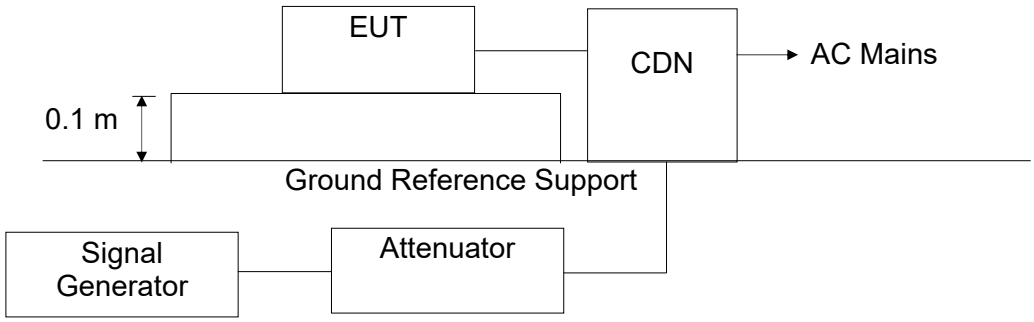
13.1. Block Diagram of Test Setup

13.1.1. Block Diagram of the EUT



(EUT: HIGH FREQUENCY ONLINE UPS)

13.1.2. Block Diagram of Test Setup



13.2. Test Standard

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

13.3. Severity Levels and Performance Criterion

13.3.1. Severity level

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

13.3.2. Performance criterion: A

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

13.4.EUT Configuration

The configuration of EUT is listed in Section 4.3.

13.5.Operating Condition of EUT

13.5.1.Setup the EUT as shown in Section 13.1.

13.5.2.Turn on the power of all equipments.

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

13.6.Test Procedure

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

13.7.Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant	: EAST GROUP CO., LTD.	Test Date	: May 07, 2016
EUT	: HIGH FREQUENCY ONLINE UPS	Temperature	: 23℃
M/N	: 30kVA	Humidity	: 50%
Power Supply	: AC 380V/50Hz	Actual Criterion	: A
Test Engineer	: ZCJ		

Test Mode **:** Line mode

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Input	10V	A	A
0.15 ~ 80	AC Output	10V	A	A

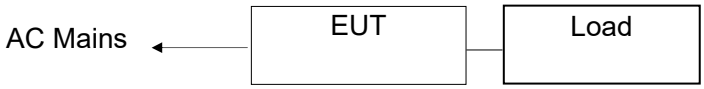
Remark **:** 1. Modulation Signal**:**1KHz 80% AM
Measurement Equipment :
Simulator: CWS 500C (SWITZERLAND EMTEST)
CDN : ☐CDN-M332 (SWITZERLAND EMTEST)
☐CDN-M432 (SWITZERLAND EMTEST)
☒CDN-M532 (SWITZERLAND EMTEST)
☐Injection Clamp (EMTEST F-2031-23MM)

Note**: /**

14. MAGNETIC FIELD SUSCEPTIBILITY TEST

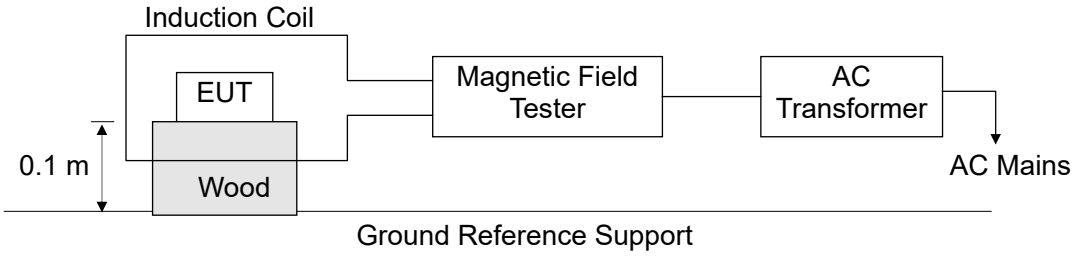
14.1.Block Diagram of Test

14.1.1.Block diagram of test setup



(EUT: HIGH FREQUENCY ONLINE UPS)

14.1.2.Magnetic field test setup



(EUT: HIGH FREQUENCY ONLINE UPS)

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 Supply 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 (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 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: ☒ Pass / ☐ Fail

Applicant : EAST GROUP CO., LTD.

EUT : HIGH FREQUENCY ONLINE UPS M/N : 30kVA

Input Voltage : AC 380V/50Hz

Date of Test : May 07, 2016 Test Engineer : ZCJ

Ambient Condition : Temp : 22℃ Humid : 50%

Actual Criterion : A

Operation Mode : Line mode

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
30	5 mins	X	A	A
30	5 mins	Y	A	A
30	5 mins	Z	A	A

Operation Mode : N/A

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result

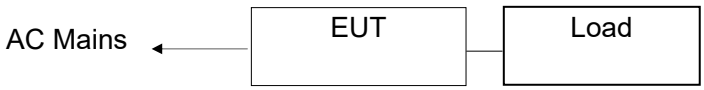
Test Equipment	Magnetic Field Test : HEAFELY MAG 100.1

Note: /

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

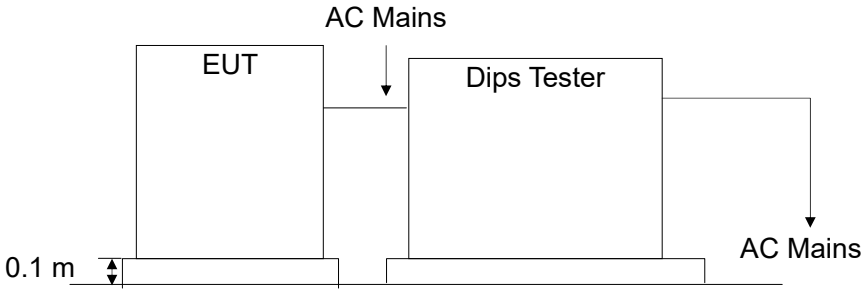
15.1. Block Diagram of Test Setup

15.1.1. Block Diagram of the EUT



(EUT: HIGH FREQUENCY ONLINE UPS)

15.1.2. Dips Test Setup



(EUT: HIGH FREQUENCY ONLINE UPS)

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 Supply 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 equipments.

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	: EAST GROUP CO., LTD.	Test Date	: May 07, 2016
EUT	: HIGH FREQUENCY ONLINE UPS	Temperature	: 22℃
M/N	: 30kVA	Humidity	: 50%
Power Supply	: AC 380V/50Hz	Test Engineer	: ZCJ

Test Mode: Line mode

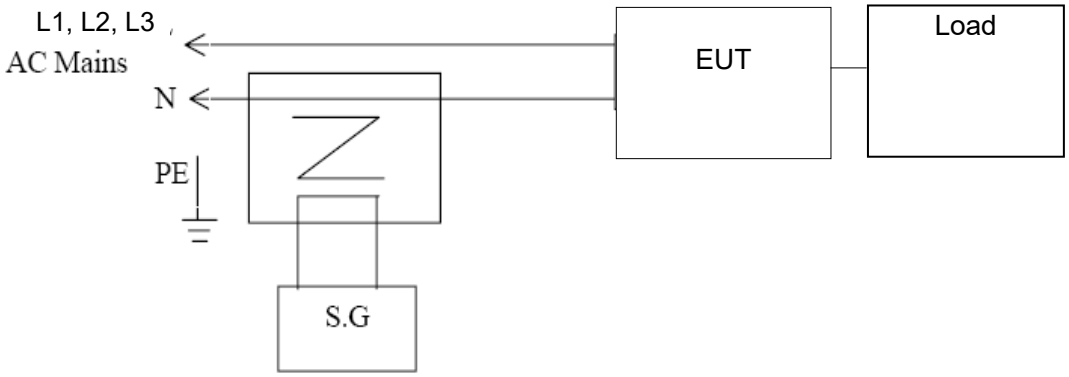
Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in periods)	Criterion ☐ A ☒ B ☐ C ☐ D	Result
0	100	0.5P	B	A
40	60	10P	B	A
70	30	25P	B	A
0	100	250P	B	A

Note:

16. LOW FREQUENCY SIGNALS TEST

16.1. Block Diagram of Test Setup

15.1.1 Block Diagram of the EUT



(EUT: HIGH FREQUENCY ONLINE UPS)
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	:	EAST GROUP CO., LTD.	Test Date	:	May 07, 2016
EUT	:	HIGH FREQUENCY ONLINE UPS	Temperature	:	22℃
M/N	:	30kVA	Humidity	:	58%
Power Supply	:	AC 380V/50Hz	Test Mode	:	Line mode
Test Engineer	:	ZCJ	Actual Criterion	:	A

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

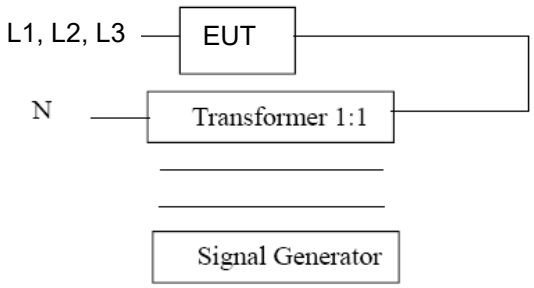


Fig.1

Test Equipment:
1. Isolation transformer
   Primary: Secondary=1:1
2. Signal Generator
   AC Source: 6530(Chroma)

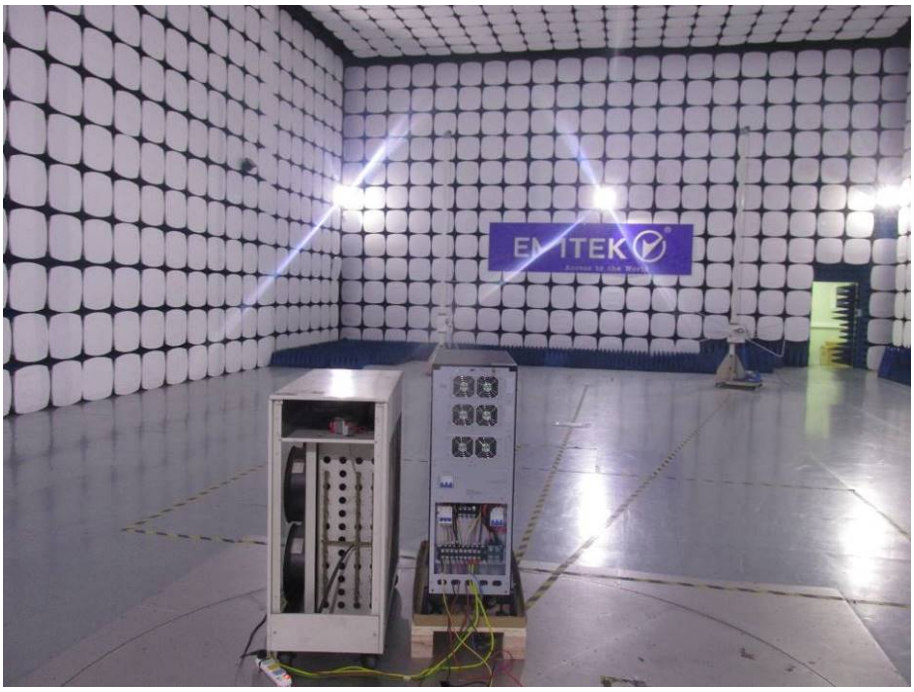
17. TEST PHOTOGRAPH

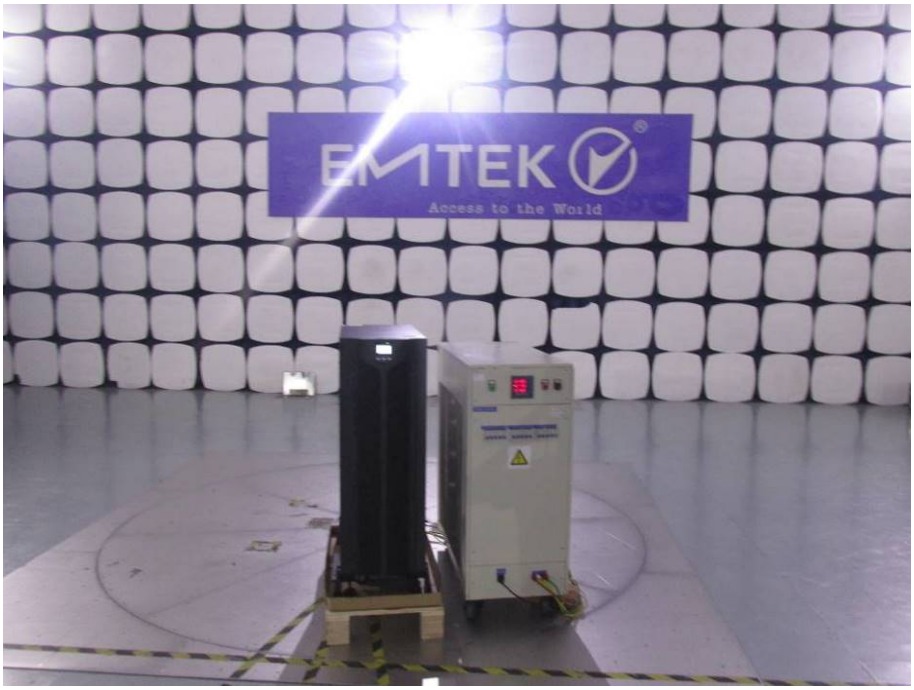
17.1.Photos of Conducted Emission Measurement





17.2.Photo of Radiation Emission Measurement





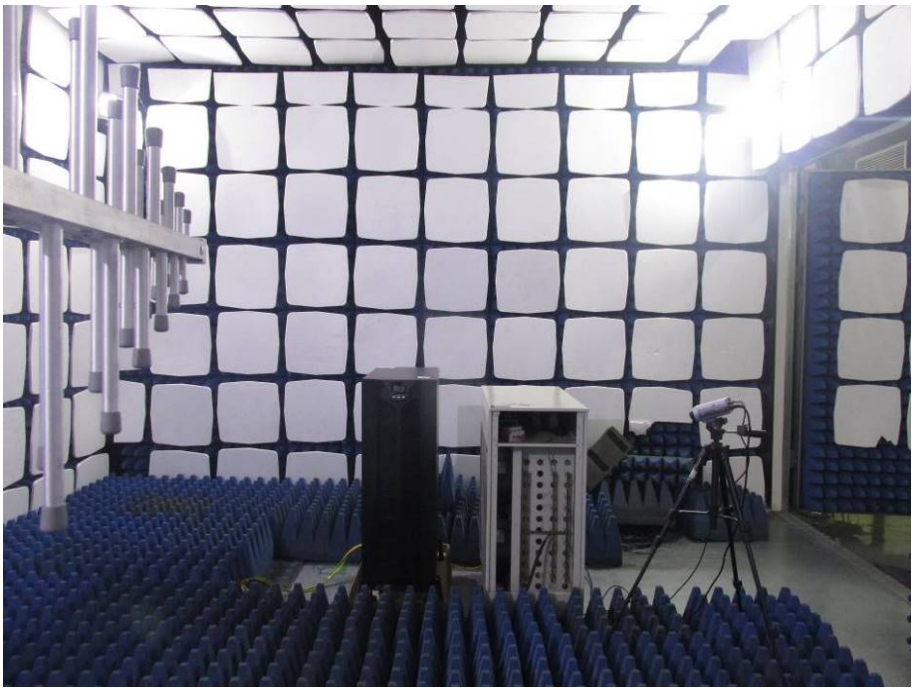
17.3.Photo of Harmonic Measurement



17.4.Photo of Electrostatic Discharge Test



17.5.Photo of RF Field Strength susceptibility Test



17.6.Photos of Electrical Fast Transient /Burst Test



17.7.Photo of Surge Test



17.8.Photo of Injected Currents Susceptibility Test



17.9.Photo of Magnetic Field Immunity Test



17.10.Photo of Voltage dips and interruption Test



17.11.Photo of Low Frequency Signals Test



APPENDIX
(Photos of EUT)





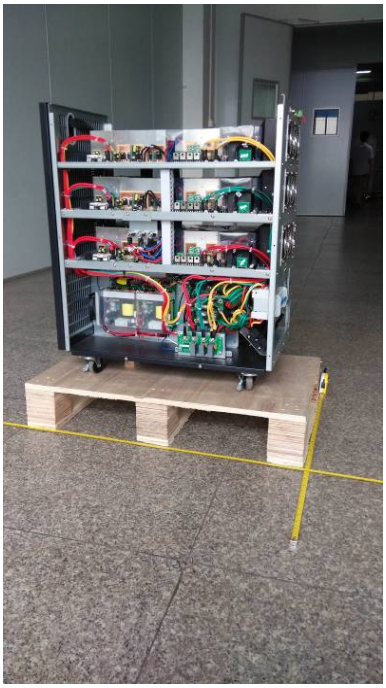




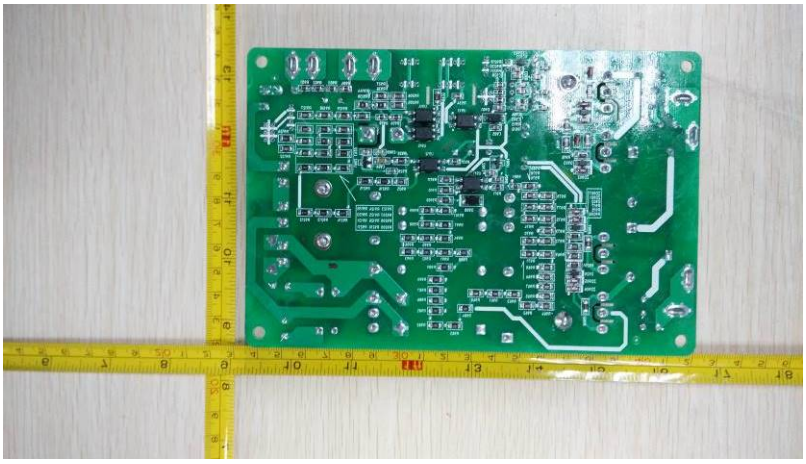


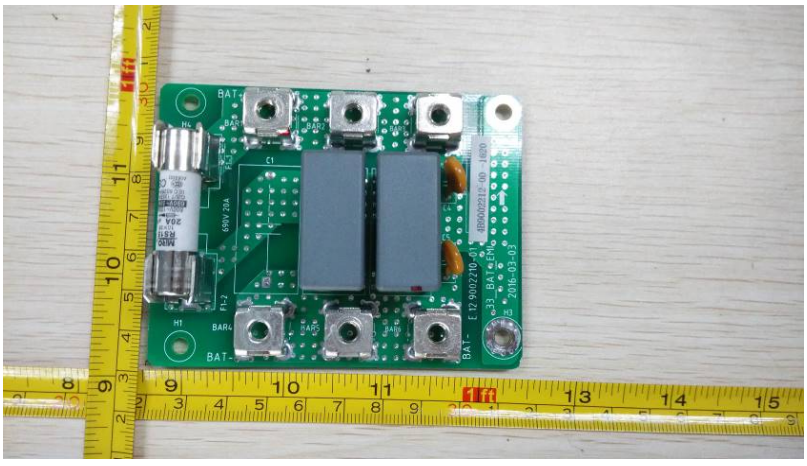


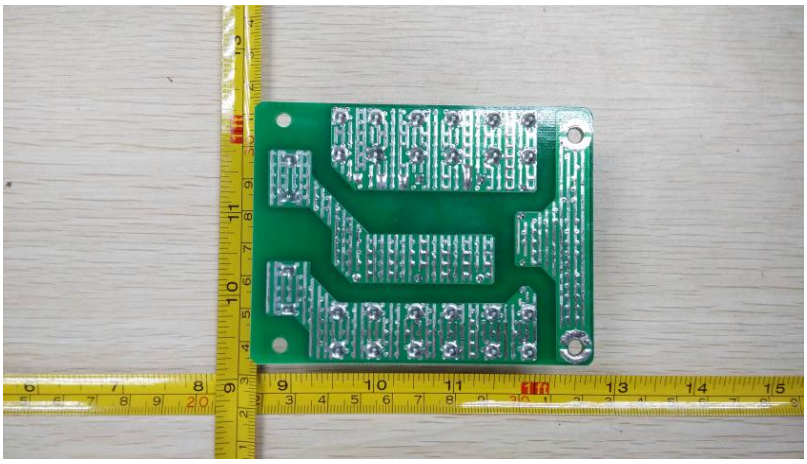


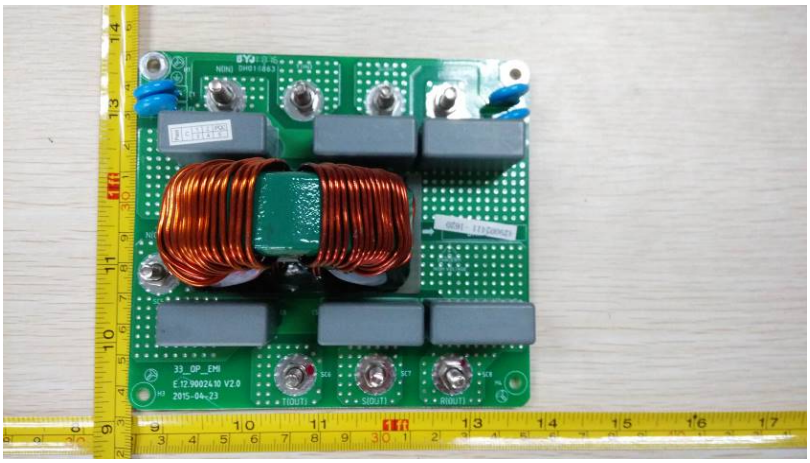


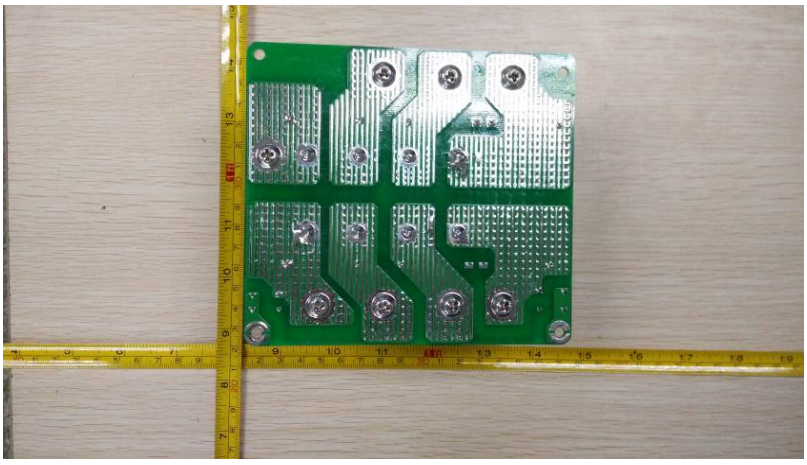


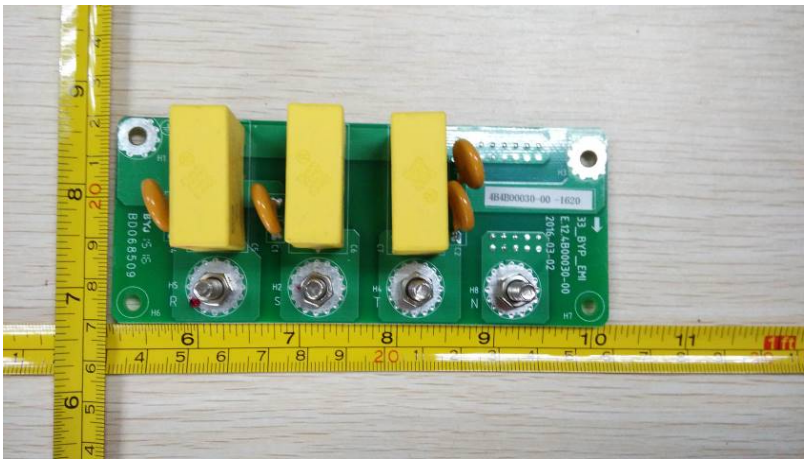


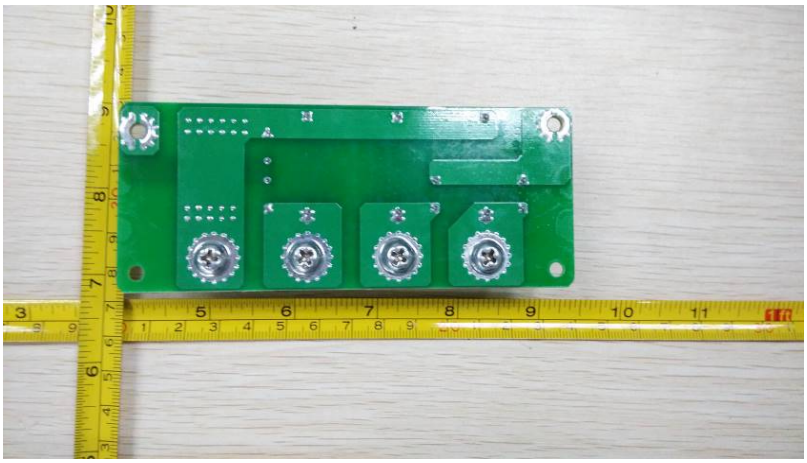


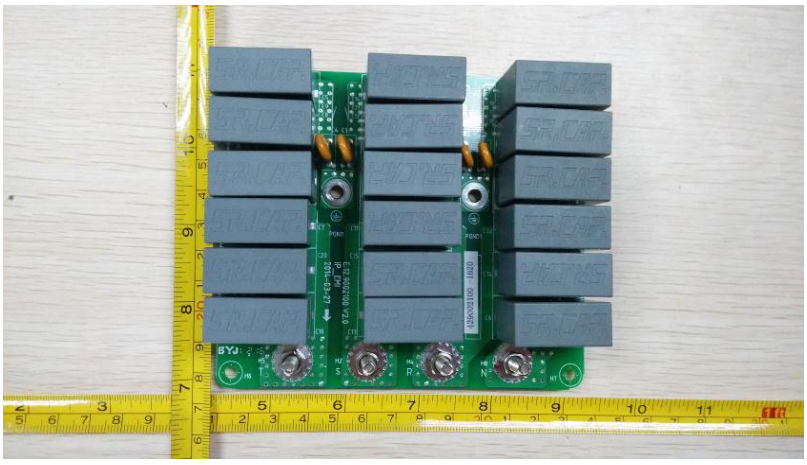


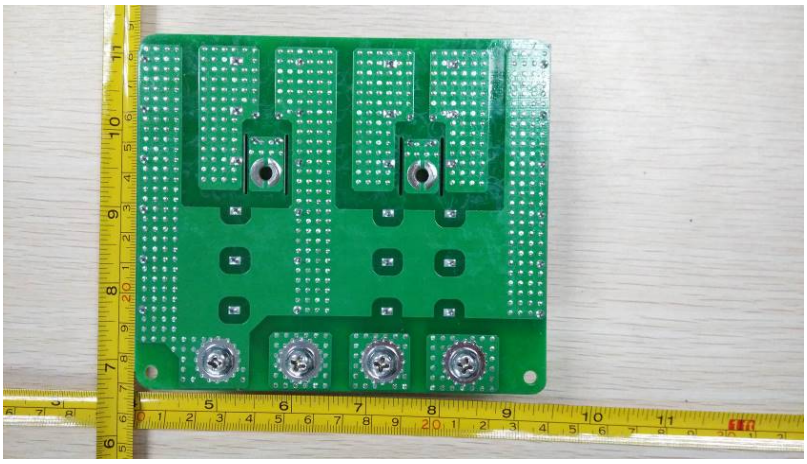




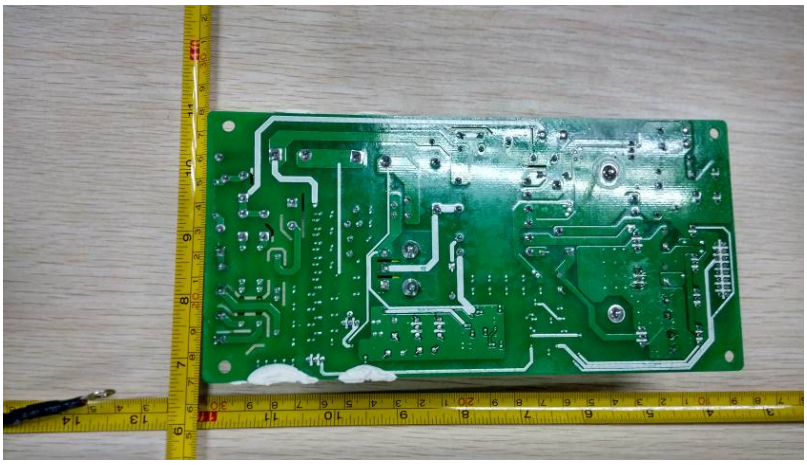


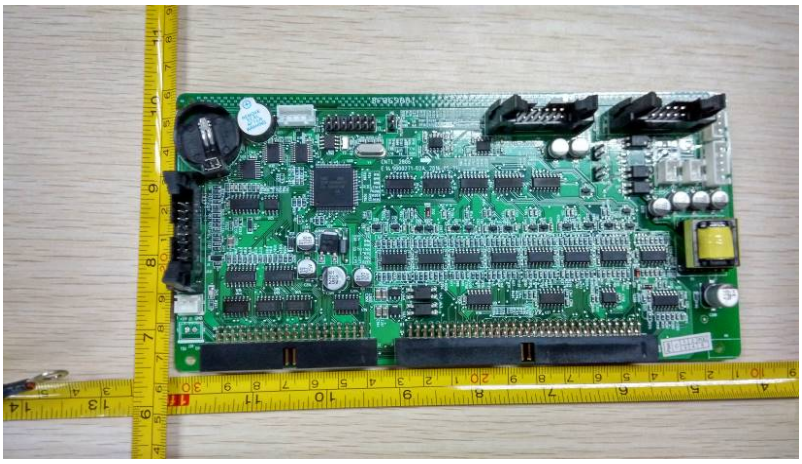


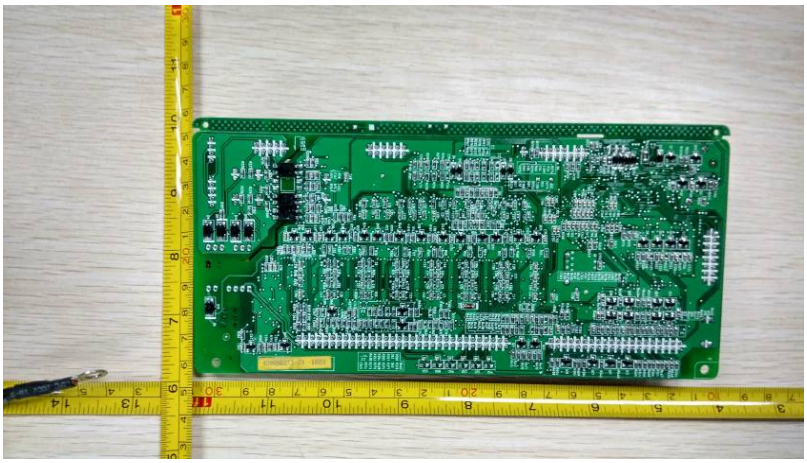


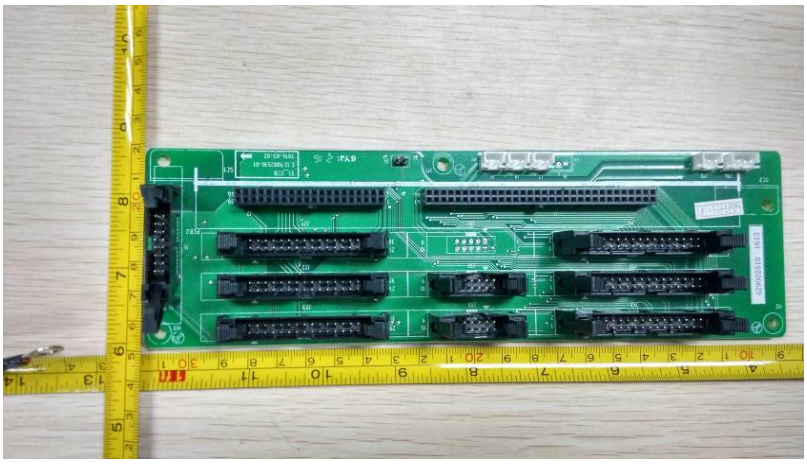


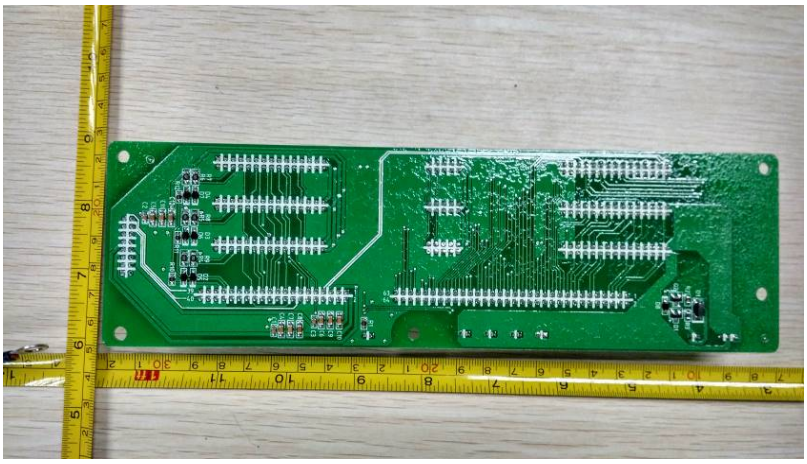

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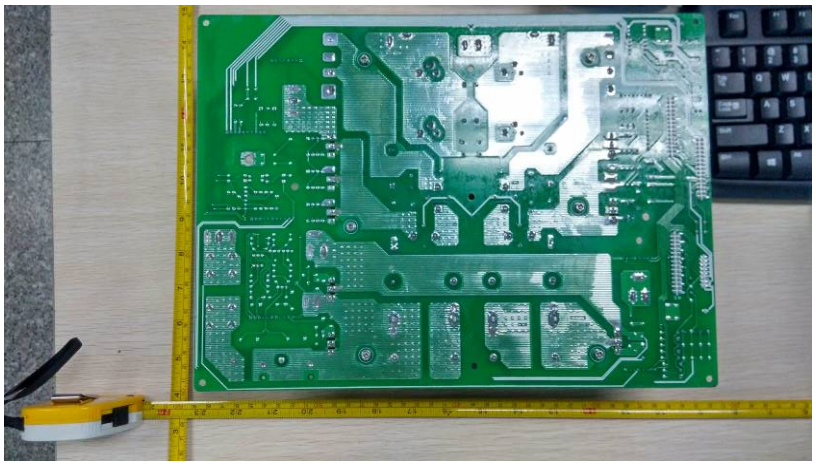




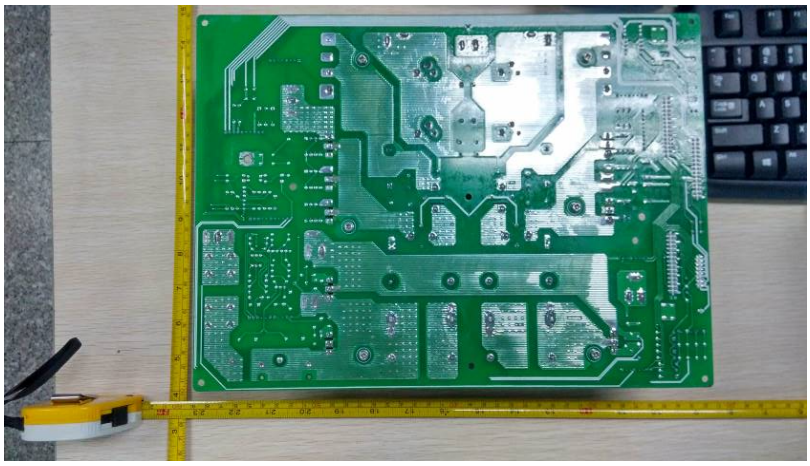


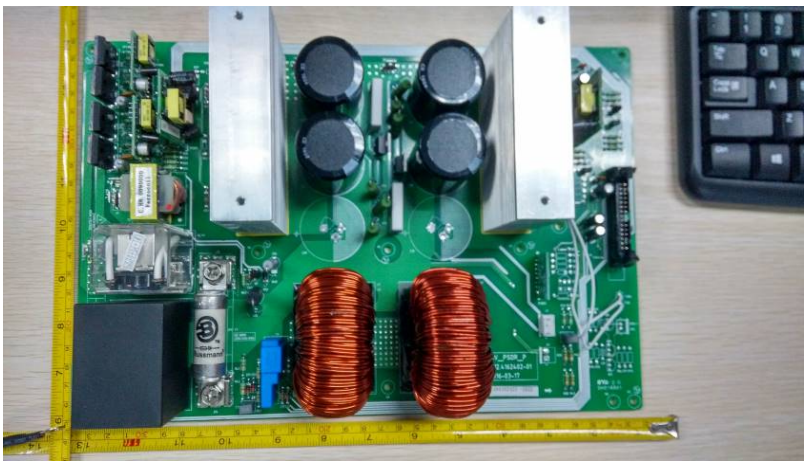


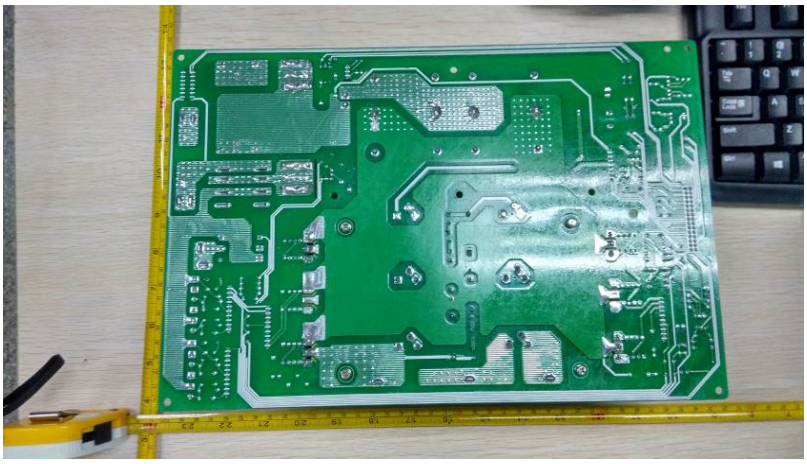


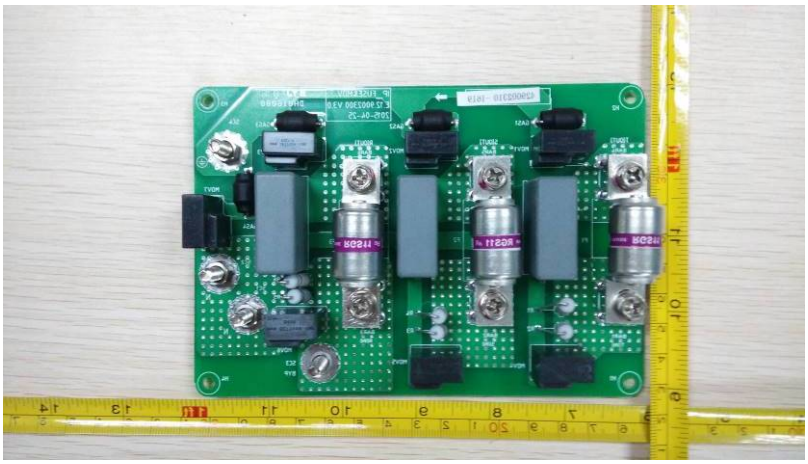


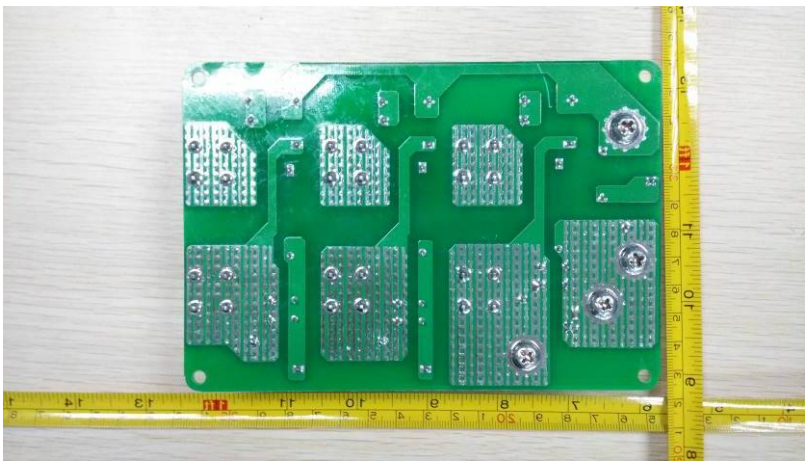












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