CERTIFICATION

Applicant	:	American Power Conversion Holding Inc. Taiwan Branch
Address	:	3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Manufacturer	:	American Power Conversion Holding Inc. Taiwan Branch
Address	:	3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Description of EUT	:	Uninterruptible Power System
Trade Name	:	APC
Model Number	:	BX1400UI
Product Series	:	BX1400UXXXXXXXX (“ X ”can be 0-9, A-Z ,“ - ”or blank)
Type of Test	:	**EMC Directive 2004/108/EC for CE Marking**
Technical Standard	:	**Emission**
		EN 62040-2: 2006 Environment: First Classification of EUT: Category C1
		IEC61000-3-2:2005+A1:2008+A2:2009
		IEC61000-3-3:2013
		Immunity
		EN 62040-2: 2006
		IEC61000-4-2:2008 / IEC61000-4-6:2008
		IEC61000-4-3:2006+A1:2007+A2:2010 / IEC61000-4-8:2009
		IEC61000-4-4:2012 / IEC61000-2-2:2002
		IEC61000-4-5:2005
Report Number	:	HA140433-CE
Receipt Date	:	27-JUN-2014
Issued Date	:	10-JUL-2014
Test Result	:	**Compliance**

The above equipment was tested by *HongAn TECHNOLOGY CO., LTD.*, for compliance with the requirement set forth in EMC Directive 2004/108/EC and the technical standards mentioned above.

Note :

1. The results of the test report relate only to the sample tested.

2. The test report shall not be reproduced without the written approval of *HongAn TECHNOLOGY CO., LTD.*

Approved by: Adam Yang

Adam Yang / Section Manager

HongAn TECHNOLOGY CO., LTD.

NO.15-1, CWEISHUH KENG, CWEIPIN VILLAGE,

LINKOU DIST, NEW TAIPEI CITY, TAIWAN, R.O.C.

TEL：+886-2-26030362

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E-mail：hatlab@ms19.hinet.net

BSMI Registration No.： SL2-IN-E-0023,SL2-IS-E-0023, SL2-A1-E-0023,SL2-R1-E-0023, SL2-R2-E-0023,SL2-L1-E-0023

FCC Designation No.： TW1071

TUV Nort Cert No.:TNTW1006R-01

TAF Accreditation No.：1163

VCCI Registration No.：R-2156, C-2329, T-219 G-696

EMC COMPLIANCE TEST REPORT

Technical Statement of Conformity

in accordance with the council directive 2004/108/EC

The product

Equipment Under Test	:	Uninterruptible Power System
Model Number	:	BX1400UI
Product Series	:	BX1400UXXXXXXXX (“ X ”can be 0-9, A-Z ,“ - ”or blank)
Report Number	:	HA140433-CE
Issue Date	:	10-JUL-2014
Test Result	:	**Compliance**

is produced by

American Power Conversion Holding Inc. Taiwan Branch

3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.

HongAn TECHNOLOGY CO., LTD.

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Contents

Verification

Applicant：	American Power Conversion Holding Inc. Taiwan Branch
Manufacturer：	American Power Conversion Holding Inc. Taiwan Branch
Equipment Under Test：	Uninterruptible Power System
Model Number：	BX1400UI
Product Series：	BX1400UXXXXXXXX (“ X ”can be 0-9, A-Z ,“ - ”or blank)
Sample Received Date：	**27-JUN-2014**
Test Standard：	

Emission:	**Immunity:**
☒ EN 60204-2:2006	☒ EN 60204-2:2006
☒ IEC 61000-3-2:2005 +A1:2008+A2:2009	☒ IEC 61000-4-2:2008
☒ IEC 61000-3-3:2013	☒ IEC 61000-4-3:2006+A1:2007+A2:2010
	☒ IEC 61000-4-4:2012
	☒ IEC 61000-4-5:2005
	☒ IEC 61000-4-6:2008
	☒ IEC 61000-4-8:2009
	☒ IEC 61000-2-2:2002

Remark:

This report details the results of the test carried out on one sample. This report shows the EUT is technically compliant with the EN 62040-2 official requirements. This report applies to the above sample only and shall not be reproduced in part without written approval of HongAn Technology Co., Ltd.

Documented by: Zoe Chen. **Date:** 2014-07-10

Zoe Chen / ADM. Dept. Staff

Tested by: Leon Chen **Date:** 2014-07-09

Leon Chen / ENG. Dept. Staff

Approved by: Adam Yang **Date:** 2014-07-10

Adam Yang / SEC. Manager

Summary of Test Result - Emission

Emission			
Test Standard	**Test Item**	**Test Result**	**Remark**
EN 62040-2 Category C1	Conducted Emission	Pass	Highest Emission-(LINE mode) L: 0.98MHz, A.V.33.62dBuV, Margin -12.38dB N: 0.98MHz,A.V.32.78dBuV, Margin -13.22dB
			Highest Emission-(Battery mode) L: 0.48MHz, Q.P.44.26dBuV, Margin -12.15dB N: 0.43MHz,Q.P.46.41dBuV, Margin -10.79dB
EN 62040-2 Category C1	Radiated Emission	Pass	Highest Emission-(LINE mode) H: 47.34,MHz, 16.43dBuV, Margin -13.57dB Antenna Height 367 cm, Turntable Angle 172° V: 228.60MHz, 18.65dBuV, Margin-11.35dB Antenna Height 122cm, Turntable Angle 199°
			Highest Emission-(Battery mode) H: 52.33,MHz, 16.14dBuV, Margin -13.86dB Antenna Height 387cm, Turntable Angle 184° V: 171.48MHz, 19.77dBuV, Margin-10.23 dB Antenna Height 137 cm, Turntable Angle 167°
IEC61000-3-2	Harmonic	Pass	Refer to Page 27
IEC61000-3-3	Flicker	Pass	Refer to Page 29

Measurement Uncertainty – Emission

The following measurement uncertainty has been calculated for Emission Tests performed on the EUT as specified in CISPR 16-4-2:

Test Item		**Uncertainty**
Conducted Emission		± 3.61dB
Radiated Emission	Below 1GHz	± 5.04dB
	Above 1GHz	± 4.97dB

This reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k = 2, providing a level of confidence of approximately 95%.

Summary of Test Result – Immunity

Immunity				
Test Standard	**Test Item**	**Performance Criteria**	**Observed Result Class**	**Test Result**
IEC61000-4-2	Electrostatic Discharge	B	A	Pass
IEC61000-4-3	Radiated Susceptibility	A	A	Pass
IEC61000-4-4	Electrical Fast Transient	B	A	Pass
IEC61000-4-5	Surge	B	A	Pass
IEC61000-4-6	Conducted Susceptibility	A	A	Pass
IEC61000-4-8	Magnetic Field	B	A	Pass
IEC61000-2-2	Low Frequency Signals Immunity Test	A	A	Pass

Measurement Uncertainty – Immunity

It has been demonstrated that the test equipments for the above Immunity Tests meet the specified requirements in the standard with at least a 95% confidence.

1 General Description

1.1 Description of EUT

Equipment Under Test	:	Uninterruptible Power System
Model Number	:	BX1400UI
Product Series	:	BX1400UXXXXXXXX (“ X ”can be 0-9, A-Z ,“ - ”or blank)
Applicant	:	American Power Conversion Holding Inc. Taiwan Branch
Address of Applicant	:	3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Manufacturer	:	American Power Conversion Holding Inc. Taiwan Branch
Address of Manufacturer	:	3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Power Supply	:	AC:230~240V/50Hz
I/O Port	:	USB*1 , RJ45*2
Data Cable	:	N/A
Description of EUT	:	**Dimensions :** 34 cm (L) X 13 cm (W) X 21.5 cm (H) **Position :** ☒Table-top / ☐Floor-standing **Category of Equipment :** ☒C1 ☐C2 ☐C3 ☐C4 **Intended Function :** The EUT is a Uninterruptible Power System **Product Variance :** The manufacturer declares that the product series is identical to the EUT. Different model numbers are adopted to distinguish the distributing markets (countries).

1.2 Test Facility

All the Conducted and Radiated Emission Tests and Immunity Tests are performed at No. 15-1, Cweishuh Keng, Cweipin Village, Linkou, New Taipei City, Taiwan, R.O.C.

1.3 Test Instruments

Instruments Used for Emission Measurement

Instrument Name	Manufacture Mode	Model Number	Serial Number	Last Cal. Date	Next Cal. Date	Test Item
LISN	EMCO	3810/2NM	9702-1820	05-AUG-2013	05-AUG-2014	Conducted Emission
LISN	EMCO	3810/2NM	9702-1818	04-MAR-2014	04-MAR-2015	Conducted Emission
LISN	Rolf Heine Hochfrequenz technik	NNB-4/32T	00001	04-MAR-2014	04-MAR-2015	Conducted Emission
RF Current Probe	FCC	F-33-4	53	17-MAY-2014	17-MAY-2015	Conducted Emission
Impedance Stabilization Network (ISN)	TESEQGMBH	ISN T800	30838	22-JUN-2014	22-JUN-2015	Conducted Emission
EMI Receiver	R&S	ESCI	100931	19-JUL-2013	19-JUL-2014	Conducted Emission, Radiation Emission
Spectrum Analyzer	ADVANTEST	R3172	101202158	29-JUL-2013	29-JUL-2014	
Preamplifier	CHASE	CPA 9231A	0405	23-AUG-2013	23-AUG-2014	Radiated Emission
Preamplifier	HD	HD17187	004	15-MAY-2014	15-MAY-2015	Radiated Emission
Bilog Antenna	TESEQ	CBL6111D	25769	25-FEB-2014	25-FEB-2015	Radiated Emission
Bilog Antenna	Schaffner	CBL6112B	2860	06-AUG-2013	06-AUG-2014	Radiated Emission
Double-Ridged Waveguide Horn	EMCO	3115	9912-5992	13-MAY-2014	13-MAY-2015	Radiated Emission
Harmonics /Flicker Module	EMC PARTNER	Harmonics-1000	HAR1000-38	20-MAR-2014	20-MAR-2015	Harmonics

※ The test equipments used are calibrated and can be traced to National ITRI and International Standards.

1.3.1 Instruments Used for Immunity Measurement

Instrument Name	Manufacture Mode	Model Number	Serial Number	Last Cal. Date	Next Cal. Date	Test Item
ESD Simulator	KeyTek	MZ-15/EC	9805460	29-JUL-2013	29-JUL-2014	ESD
Power Generator, Mains Coupler/ Decoupler	KeyTek	EMC Pro	0002255	05-MAR-2014	05-MAR-2015	EFT. Surge, Magnetic Field, Dip
Wide Band Amplifier	ifi	CMX50	D019-0200	19-FEB-2014	19-FEB-2015	RS,CS
RF Amplifier	ar	15S1G3	306578	19-FEB-2014	19-FEB-2015	RS
Double-Ridged Waveguide Horn	EMCO	3115	9912-5992	13-MAY-2014	13-MAY-2015	RS
Signal Generator	HP	HP8648C	3623A03457	19-FEB-2014	19-FEB-2015	RS,CS
Bilog Antenna	EMCO	3142	9710-1221	19-FEB-2014	19-FEB-2015	RS
CDN	FCC	FCC-801-M3-32A	2019	21-FEB-2014	21-FEB-2015	CS
CDN	FCC	FCC-801-M3-32A	20116	21-FEB-2014	21-FEB-2015	CS
EM Injection clamp	FCC	F-2031-23mm	337	21-FEB-2014	21-FEB-2015	CS
Magnetic Field Immunity Loop	FCC	F-1000-4-819 /10-L-1M	9953	05-MAR-2014	05-MAR-2015	MF

※ The test equipments used are calibrated and can be traced to National ITRI and International Standards.

1.4 Test Methodolgy

All Emission Tests were performed according to the procedures specified in EN 62040-2.

All Immunity Tests were performed according to the procedures specified in EN 62040-2.

1.5 Auxiliary Equipments

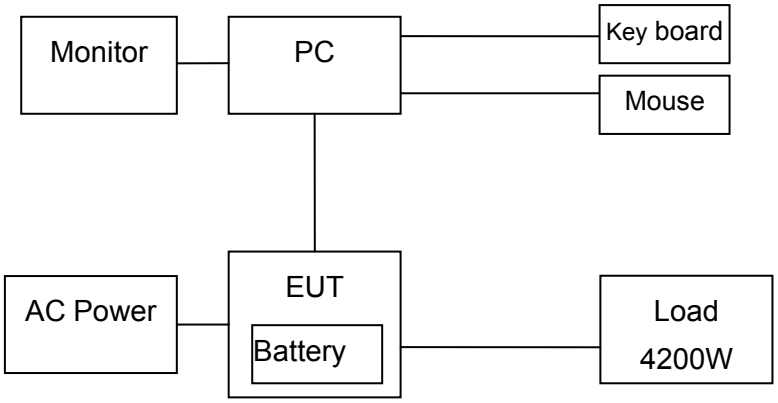
Provided by HongAn Technology Co., Ltd.

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Power Cord
A14	PC	HP Pro 3330 MT	SGH206SKS9	BSMI ID R33001	Hewlett Packard	Unshielded,1.8m
B2	Keyboard	Y-BP62a	867604-0121	T51160	Logitech	N/A
C15	Mouse	MO96UOB	96NO35688	CE Mark, FCC DoC, BSMI ID R41108	ASUS	N/A
E4	Monitor	VW161	85LMTN090836	CE Mark, FCC DoC	ASUS	N/A

Provided by the Manufacturer

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Remark
N/A	N/A	N/A	N/A	N/A	N/A	N/A

1.6 Block Diagram



1.7 Identifying the Final Test Mode (Worst Case)

1. LINE mode
2. Battery mode.

Note:

1. After pre-test, we identified that the LINE Mode (the worst case) was most likely to cause maximum disturbance at Conducted Emission. Therefore, the Final EMC Assessment was performed for the worst case.
2. After pre-test, we identified that the Battery Mode (the worst case) was most likely to cause maximum disturbance at Radiated Emission. Therefore, the Final EMC Assessment was performed for the worst case.

1.8 Final Test Mode

1. For Conducted Emission: choosing LINE Mode.
2. For Radiated Emission: choosing Battery Mode.
3. For Immunity test: choosing LINE Mode.

1.9 Condition of Power Supply

AC 230 V; 50 Hz

1.10 EUT Configuration

1. Setup the EUT as shown in Sec.1.4 Block Diagram.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode.

1.11 Immunity Performance Classification

Class	Class Criterion
A	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.
B	After the test, the equipment shall continue to operate as intended without operator intervention.
C	Lost of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the user in accordance with the manufacturer’s instructions.

2 Conducted Emission Test

2.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

2.2 Test Arrangement and Procedure

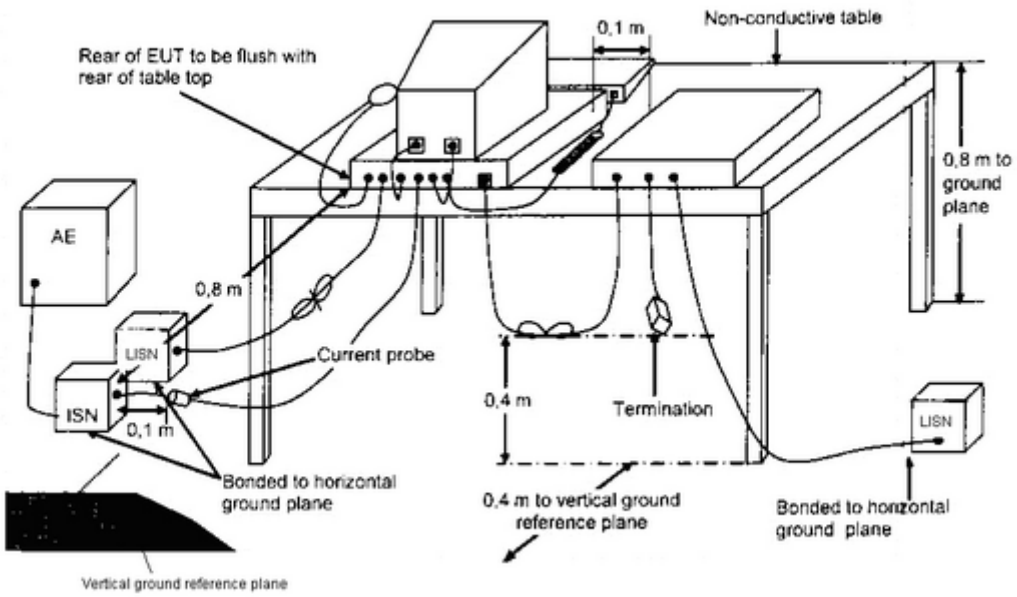


Table-top Equipment

- The EUT was placed on a non-conductive table which was 80 cm above the horizontal coupling plane. The rear of the EUT was 40 cm from the vertical coupling plane.
- The excess interface cables were folded at the cable center into a bundle no longer than 40 cm, so that the bundles were on the table.
- The EUT was connected to the main power through a L.I.S.N. This set up provided 50 ohm / 50 μH coupling impedance for the measuring equipment.
- All auxiliary equipment received power from a second L.I.S.N.
- The conducted emissions were measured between the Line Phase and the PE ground and between the Neutral Phase and the PE ground using an EMI Receiver.
- The values were recorded.

2.3 Conducted Limit

EN 62040-2

Frequency Range (MHz)	Limits dB(uV)			
	☒ Category C1 UPS		☐ Category C2 UPS	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 ~ 0.50	66 to 56	56 to 46	79	66
0.50 ~ 5.0	56	46	73	60
5.0 ~ 30	60	50	73	60

☐ Category C3 UPS

UPS rated output current A	Frequency Range (MHz)	Limits dB(uV)	
		Q.P. (Quasi-Peak)	A.V. (Average)
>16 - 100	0.15 ~ 0.50	100	90
	0.50 ~ 5.0	89	76
	5.0 ~ 30	90 to 70	80 to 60
>100	0.15 ~ 0.50	130	120
	0.50 ~ 5.0	125	115
	5.0 ~ 30	115	105

The EMI Receiver bandwidth was set at 9 kHz.

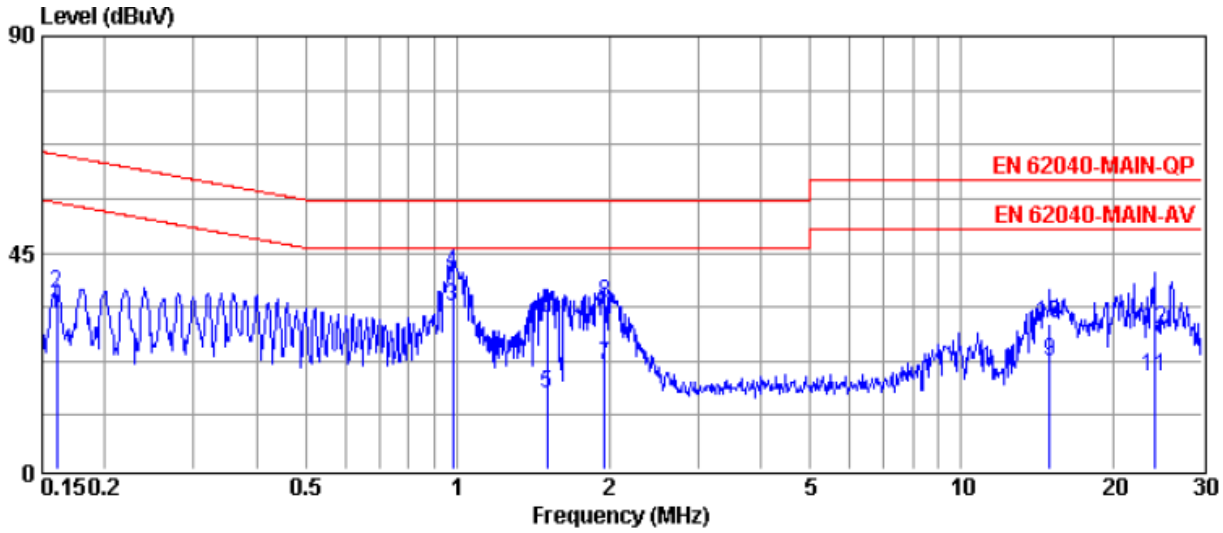
2.4 Test Result

PASS

The final test data are shown on the following page(s).

Conducted Emission Test Data-LINE mode

Test Date	:	2014-07-08	Power Line	:	Line
Temperature	:	26℃	Humidity	:	35%

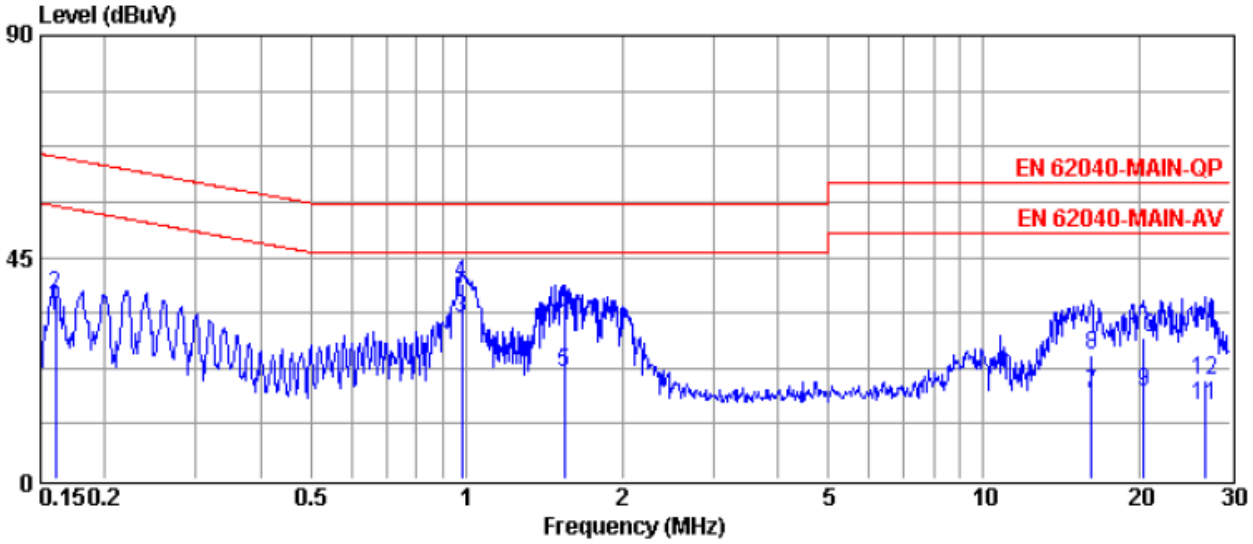


No.	Freq MHz	Reading dBµV	C.F dB	Result dBµV	Limit dBµV	Margin dB	Power Line	Remark
1	0.16	22.16	10.09	32.25	55.43	-23.18	LINE	Average
2	0.16	26.43	10.09	36.52	65.43	-28.91	LINE	QP
3	0.98	23.51	10.11	33.62	46.00	-12.38	LINE	Average
4	0.98	30.62	10.11	40.73	56.00	-15.27	LINE	QP
5	1.50	5.49	10.13	15.62	46.00	-30.38	LINE	Average
6	1.50	21.27	10.13	31.40	56.00	-24.60	LINE	QP
7	1.96	11.54	10.15	21.69	46.00	-24.31	LINE	Average
8	1.96	24.45	10.15	34.60	56.00	-21.40	LINE	QP
9	14.99	11.16	11.12	22.28	50.00	-27.72	LINE	Average
10	14.99	19.01	11.12	30.13	60.00	-29.87	LINE	QP
11	24.14	7.26	11.99	19.25	50.00	-30.75	LINE	Average
12	24.14	17.24	11.99	29.23	60.00	-30.77	LINE	QP

Remark：All readings are Quasi-Peak and Average values.

Conducted Emission Test Data-LINE mode

Test Date	:	2014-07-08	Power Line	:	Neutral
Temperature	:	26℃	Humidity	:	35%

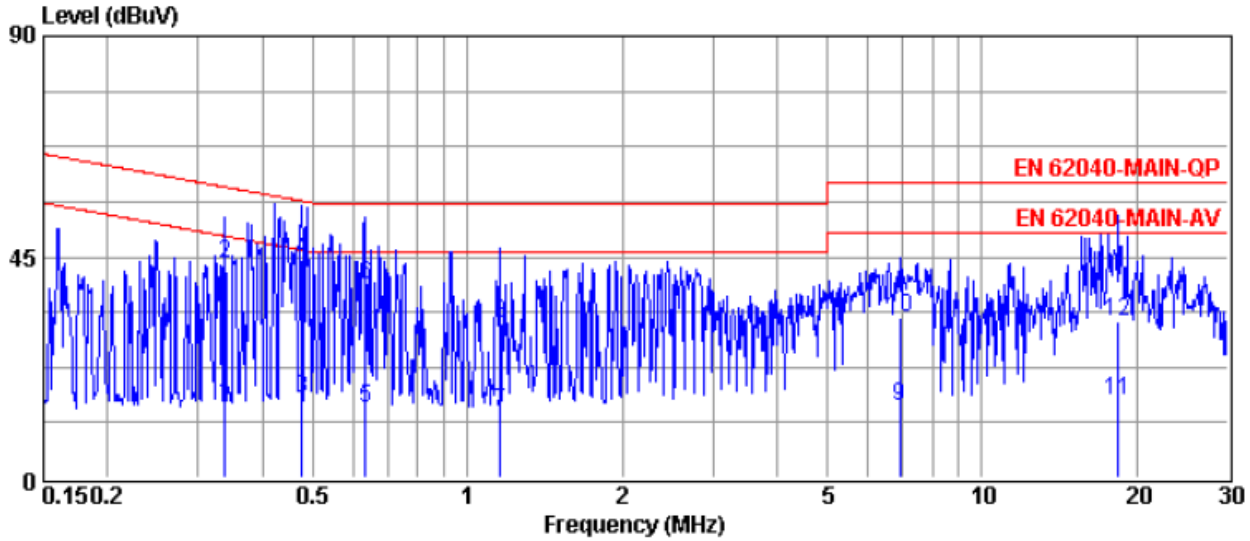


No.	Freq MHz	Reading dBµV	C.F dB	Result dBµV	Limit dBµV	Margin dB	Power Line	Remark
1	0.16	22.80	10.11	32.91	55.43	-22.52	NEUTRAL	Average
2	0.16	27.36	10.11	37.47	65.43	-27.96	NEUTRAL	QP
3	0.98	22.66	10.12	32.78	46.00	-13.22	NEUTRAL	Average
4	0.98	29.63	10.12	39.75	56.00	-16.25	NEUTRAL	QP
5	1.54	11.34	10.14	21.48	46.00	-24.52	NEUTRAL	Average
6	1.54	23.58	10.14	33.72	56.00	-22.28	NEUTRAL	QP
7	16.14	6.05	11.21	17.26	50.00	-32.74	NEUTRAL	Average
8	16.14	13.84	11.21	25.05	60.00	-34.95	NEUTRAL	QP
9	20.38	6.19	11.68	17.87	50.00	-32.13	NEUTRAL	Average
10	20.38	16.85	11.68	28.53	60.00	-31.47	NEUTRAL	QP
11	26.84	2.40	12.49	14.89	50.00	-35.11	NEUTRAL	Average
12	26.84	7.63	12.49	20.12	60.00	-39.88	NEUTRAL	QP

Remark：All readings are Quasi-Peak and Average values.

Conducted Emission Test Data-Battery mode

Test Date	:	2014-07-08	Power Line	:	Line
Temperature	:	26℃	Humidity	:	35%

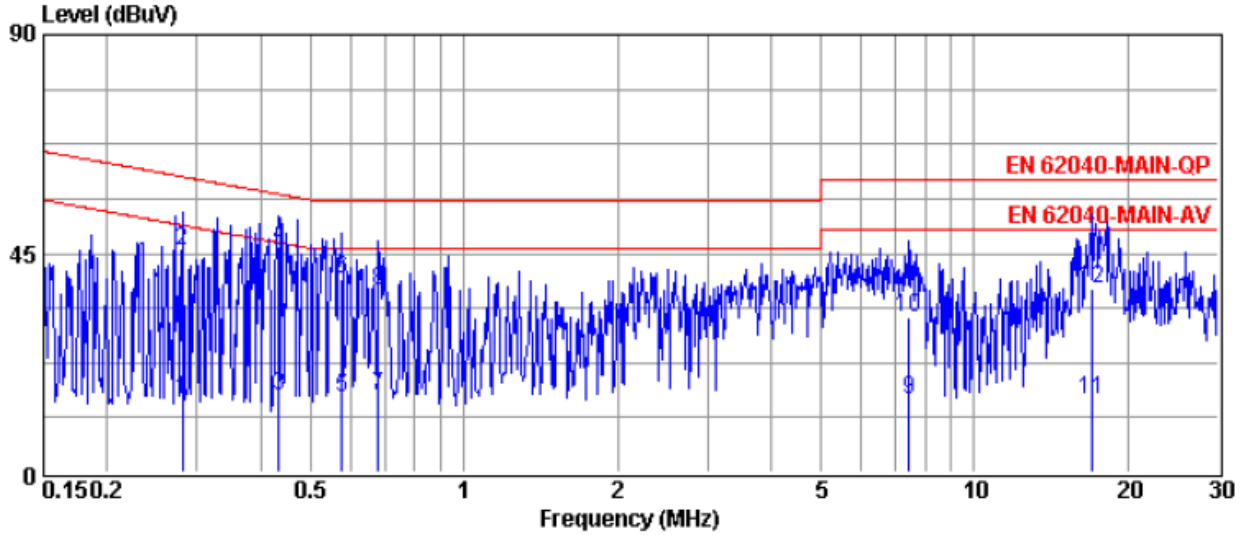


No.	Freq MHz	Reading dBµV	C.F dB	Result dBµV	Limit dBµV	Margin dB	Power Line	Remark
1	0.34	5.02	10.07	15.09	49.27	-34.18	LINE	Average
2	0.34	33.46	10.07	43.53	59.27	-15.74	LINE	QP
3	0.48	6.12	10.08	16.20	46.41	-30.21	LINE	Average
4	0.48	34.18	10.08	44.26	56.41	-12.15	LINE	QP
5	0.63	4.12	10.09	14.21	46.00	-31.79	LINE	Average
6	0.63	29.35	10.09	39.44	56.00	-16.56	LINE	QP
7	1.16	3.29	10.11	13.40	46.00	-32.60	LINE	Average
8	1.16	21.51	10.11	31.62	56.00	-24.38	LINE	QP
9	6.91	4.15	10.49	14.64	50.00	-35.36	LINE	Average
10	6.91	22.14	10.49	32.63	60.00	-27.37	LINE	QP
11	18.43	4.37	11.34	15.71	50.00	-34.29	LINE	Average
12	18.43	20.61	11.34	31.95	60.00	-28.05	LINE	QP

Remark：All readings are Quasi-Peak and Average values.

Conducted Emission Test Data-Battery mode

Test Date	:	2014-07-08	Power Line	:	Neutral
Temperature	:	26℃	Humidity	:	35%



No.	Freq MHz	Reading dBµV	C.F dB	Result dBµV	Limit dBµV	Margin dB	Power Line	Remark
1	0.28	4.68	10.08	14.76	50.81	-36.05	NEUTRAL	Average
2	0.28	35.40	10.08	45.48	60.81	-15.33	NEUTRAL	QP
3	0.43	5.57	10.08	15.65	47.20	-31.55	NEUTRAL	Average
4	0.43	36.33	10.08	46.41	57.20	-10.79	NEUTRAL	QP
5	0.58	5.26	10.09	15.35	46.00	-30.65	NEUTRAL	Average
6	0.58	29.49	10.09	39.58	56.00	-16.42	NEUTRAL	QP
7	0.68	5.61	10.11	15.72	46.00	-30.28	NEUTRAL	Average
8	0.68	27.06	10.11	37.17	56.00	-18.83	NEUTRAL	QP
9	7.45	4.61	10.26	14.87	50.00	-35.13	NEUTRAL	Average
10	7.45	21.60	10.26	31.86	60.00	-28.14	NEUTRAL	QP
11	16.93	3.47	11.30	14.77	50.00	-35.23	NEUTRAL	Average
12	16.93	26.25	11.30	37.55	60.00	-22.45	NEUTRAL	QP

Remark：All readings are Quasi-Peak and Average values.

3 Radiated Emission Test

3.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

3.2 Test Arrangement and Procedure

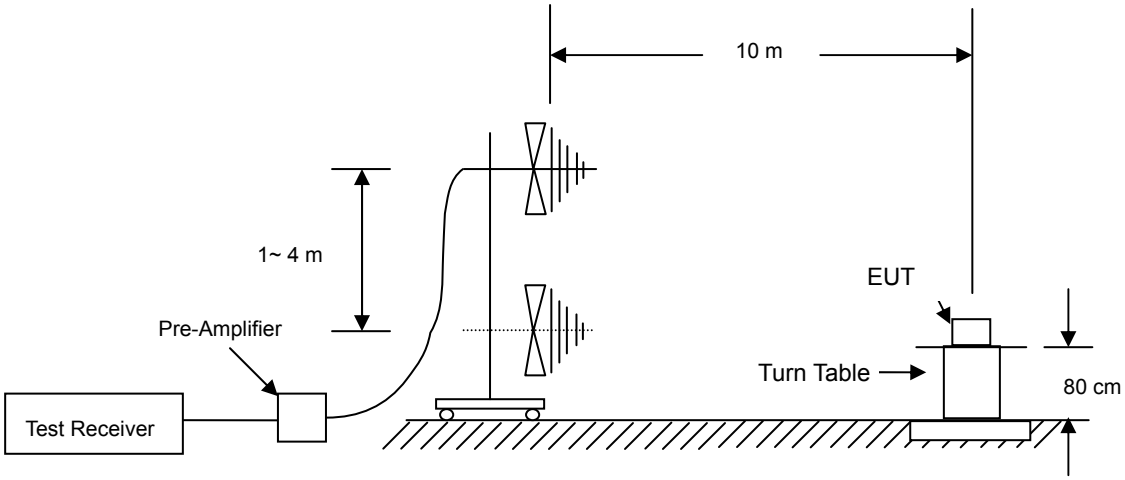


Table-top Equipment

- The EUT was place on a non-conductive turntable which was 80 cm above the horizontal ground plane. The EUT was set 10 m away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1 m and 4 m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 3.3.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded.

3.3 Radiated Limit

☒ EN 62040-2

Frequency Range (MHz)	Quasi-Peak (dBuV/m)		
	☒ Category C1UPS	☐ Category C2UPS	☐ Category C3UPS
30 ~ 230	30	40	50
230 ~ 1000	37	47	60

The EMI test receiver bandwidth was set at 120 kHz.

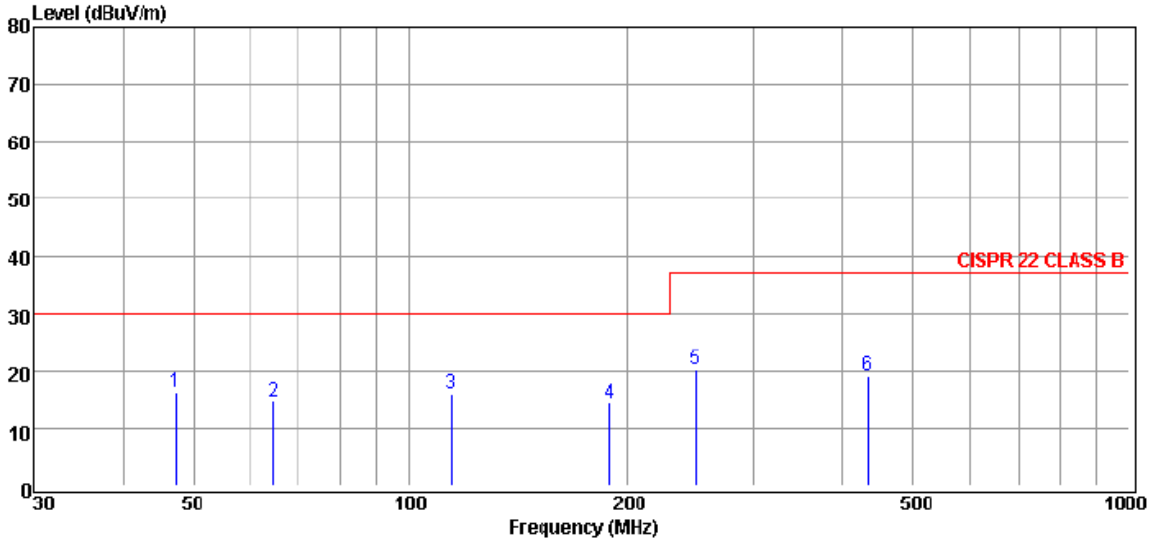
3.4 Test Result

PASS

The final test data are shown on the following page(s).

Radiated Emission Test Data-LINE mode

Test Date	:	2014-07-08	Polarization	:	Horizontal
Temperature	:	23℃	Humidity	:	44%

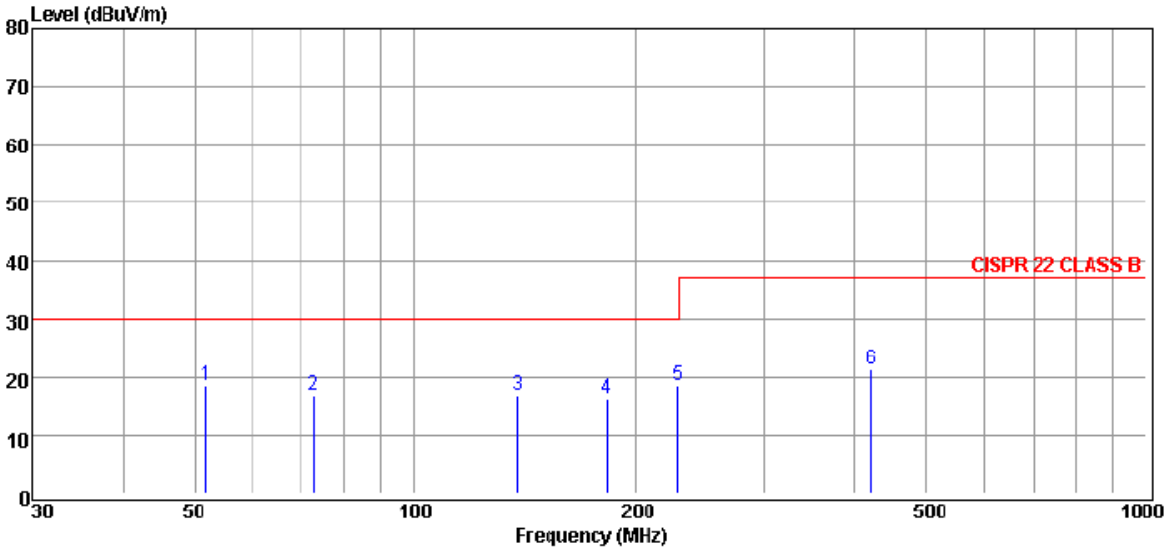


No.	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Antenna	Remark
	MHz	dBμV	dB	dBμV/m	dBμV/m	dB	cm	deg	Pol.	
1	47.34	36.68	-20.25	16.43	30.00	-13.57	367	172	HORIZONTAL	QP
2	64.57	37.49	-22.87	14.62	30.00	-15.38	388	189	HORIZONTAL	QP
3	114.44	33.07	-17.05	16.02	30.00	-13.98	374	176	HORIZONTAL	QP
4	189.42	34.10	-19.67	14.43	30.00	-15.57	392	184	HORIZONTAL	QP
5	249.60	36.36	-16.09	20.27	37.00	-16.73	371	206	HORIZONTAL	QP
6	432.40	30.59	-11.56	19.03	37.00	-17.97	383	195	HORIZONTAL	QP

Remark：All readings are Quasi-Peak values.

Radiated Emission Test Data-LINE mode

Test Date	:	2014-07-08	Polarization	:	Vertical
Temperature	:	23℃	Humidity	:	44%

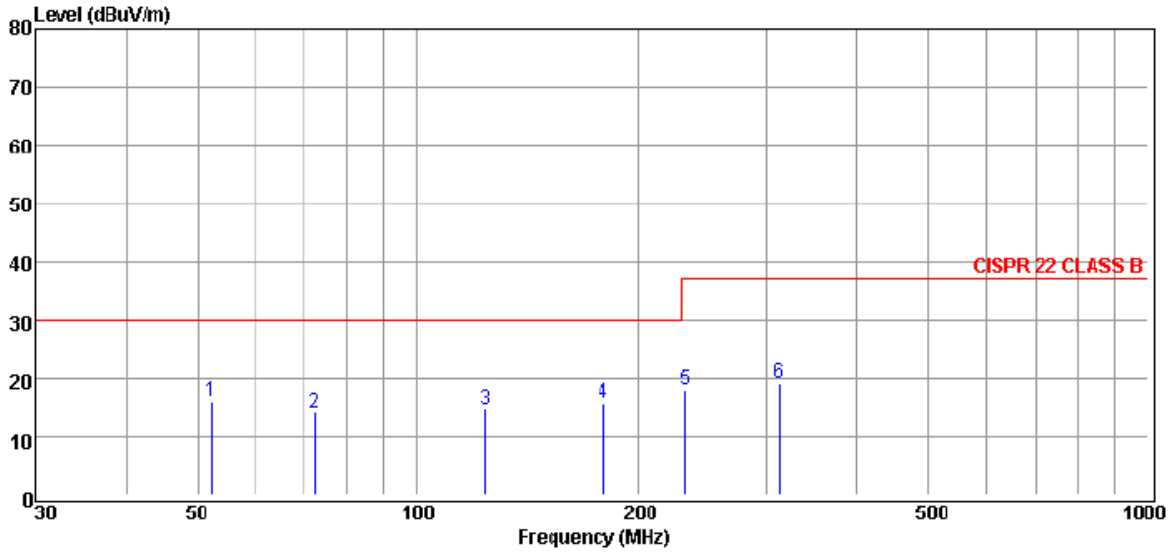


No.	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Antenna	Remark
	MHz	dBμV	dB	dBμV/m	dBμV/m	dB	cm	deg	Pol.	
1	51.92	40.22	-21.62	18.60	30.00	-11.40	106	162	VERTICAL	QP
2	72.86	39.41	-22.60	16.81	30.00	-13.19	134	186	VERTICAL	QP
3	138.36	34.45	-17.51	16.94	30.00	-13.06	128	177	VERTICAL	QP
4	183.16	36.19	-19.73	16.46	30.00	-13.54	111	172	VERTICAL	QP
5	228.60	37.35	-18.70	18.65	30.00	-11.35	122	199	VERTICAL	QP
6	420.40	33.27	-12.05	21.22	37.00	-15.78	117	207	VERTICAL	QP

Remark：All readings are Quasi-Peak values.

Radiated Emission Test Data-Battery mode

Test Date	:	2014-07-08	Polarization	:	Horizontal
Temperature	:	23℃	Humidity	:	44%

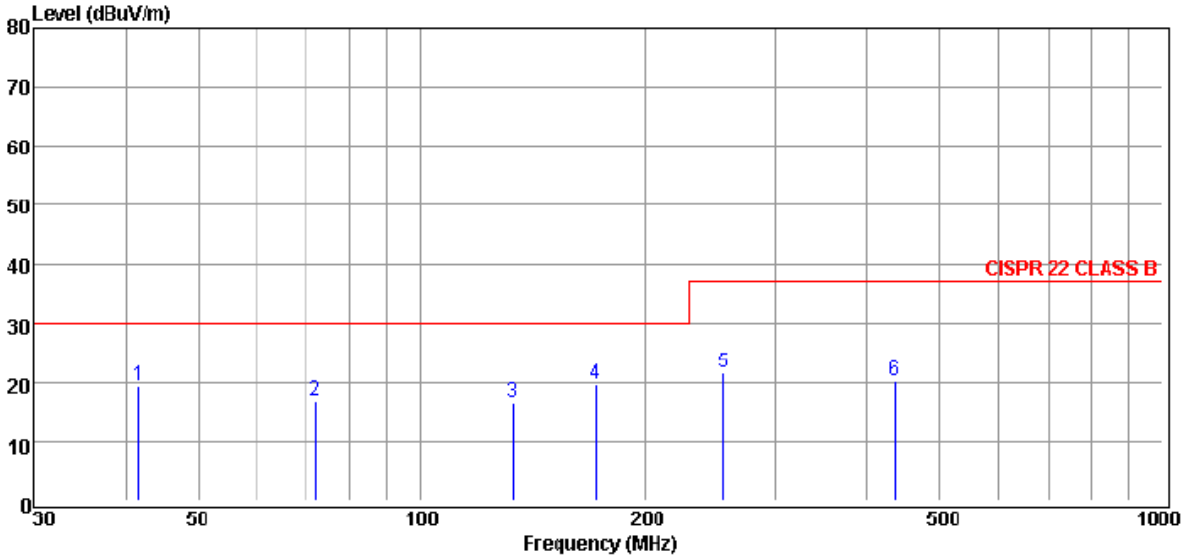


No.	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Antenna	Remark
	MHz	dBµV	dB	dBµV/m	dBµV/m	dB	cm	deg	Pol.	
1	52.33	37.84	-21.70	16.14	30.00	-13.86	387	184	HORIZONTAL	QP
2	72.40	36.84	-22.64	14.20	30.00	-15.80	378	192	HORIZONTAL	QP
3	123.82	31.46	-16.83	14.63	30.00	-15.37	382	175	HORIZONTAL	QP
4	179.67	35.58	-19.74	15.84	30.00	-14.16	391	171	HORIZONTAL	QP
5	232.20	36.29	-18.25	18.04	37.00	-18.96	368	188	HORIZONTAL	QP
6	312.20	34.28	-15.07	19.21	37.00	-17.79	372	206	HORIZONTAL	QP

Remark：All readings are Quasi-Peak values.

Radiated Emission Test Data- Battery mode

Test Date	:	2014-07-08	Polarization	:	Vertical
Temperature	:	23℃	Humidity	:	44%



No.	Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Antenna	Remark
	MHz	dBμV	dB	dBμV/m	dBμV/m	dB	cm	deg	Pol.	
1	41.54	36.91	-17.47	19.44	30.00	-10.56	129	181	VERTICAL	QP
2	72.05	39.69	-22.68	17.01	30.00	-12.99	113	203	VERTICAL	QP
3	133.12	33.88	-17.16	16.72	30.00	-13.28	108	174	VERTICAL	QP
4	171.48	39.13	-19.36	19.77	30.00	-10.23	137	167	VERTICAL	QP
5	256.00	36.78	-15.25	21.53	37.00	-15.47	134	194	VERTICAL	QP
6	434.00	31.73	-11.49	20.24	37.00	-16.76	125	199	VERTICAL	QP

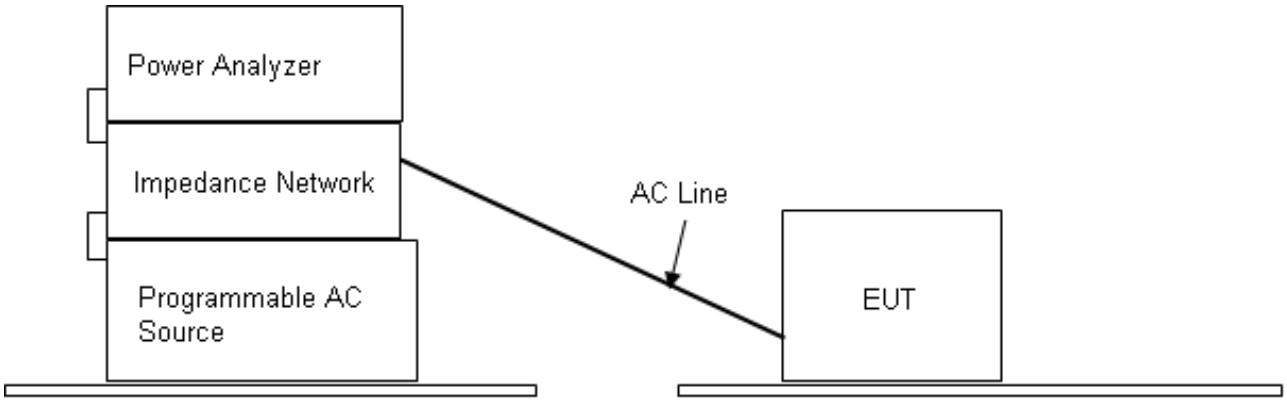
Remark：All readings are Quasi-Peak values.

4 Harmonic Current Emission Measurement

4.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

4.2 Test Configuration and Procedure



- The EUT was set in series with the Power Analyzer through an Impedance Network for the measurement of harmonic currents.
- The supply voltage and frequency setting on the Programmable AC Source was programmed as the rated voltage and frequency of the EUT.
- Classify the EUT class in accordance with the IEC61000-3-2 for the purpose of harmonic current limitation. The measurement was automatically performed by test software. The test result was collected and analyzed by the computer.

4.3 EUT Operation Condition

Environment Condition

Temperature	Humidity	Atmospheric Pressure
26℃	44%RH	1004mbar

4.4 Test Limit

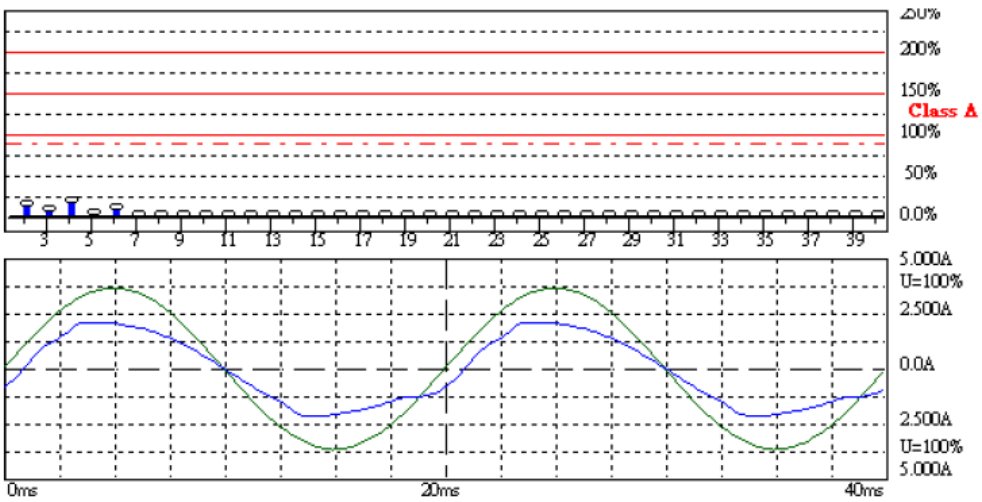
Class A Equipment

Harmonic Order (n)	Maximum permissible harmonic current (A)
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15 ≤ n ≤ 39	0.15 * 15 / n
Even harmonics	
2	1.08
4	0.43
6	0.30
8 ≤ n ≤ 40	0.23 * 8 / n

4.5 Test Result

PASS

The measured result is shown on the following page(s).



Urms = 225.8V Freq = 49.987 Range: 5 A
Irms = 1.509A Ipk = 2.151A cf = 1.426
P = 334.6W S = 340.7VA pf = 0.982
THDi = 22.1 % THDu = 0.20 % Class A

Test - Time : 1min (100 %)

Test completed, Result: PASSED

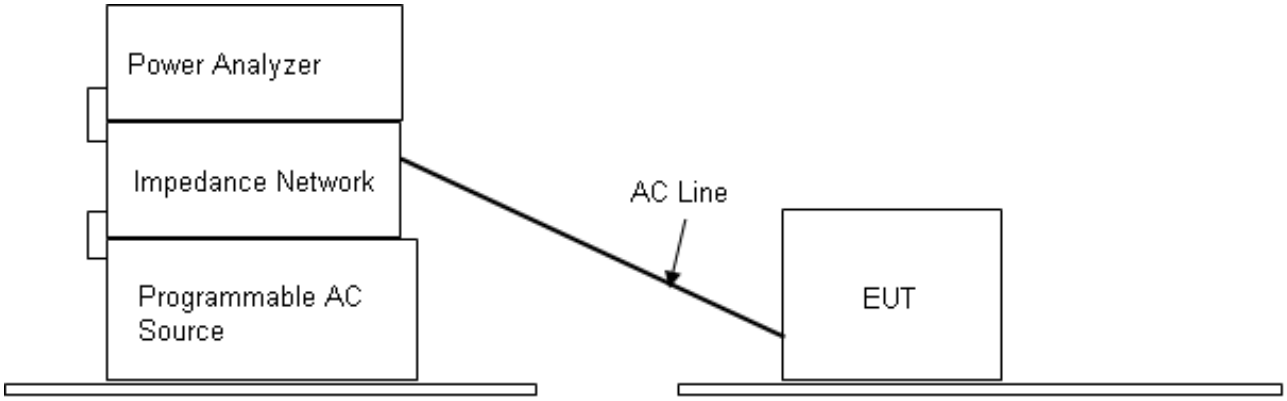
Order	Freq. [Hz]	Iavg [A]	Irms [A]	Imax [A]	Limit [A]	Statu
1	50	1.0099	1.0214	1.0214		
2	100	0.1486	0.1486	0.1486	1.0800	
3	150	0.1422	0.1422	0.1422	2.3000	
4	200	0.0739	0.0739	0.0739	0.4300	
5	250	0.0467	0.0467	0.0467	1.1400	
6	300	0.0281	0.0281	0.0281	0.3000	
7	350	0.0000	0.0076	0.0076	0.7700	
8	400	0.0000	0.0027	0.0027	0.2300	
9	450	0.0000	0.0064	0.0064	0.4000	
10	500	0.0000	0.0049	0.0049	0.1840	
11	550	0.0000	0.0021	0.0021	0.3300	
12	600	0.0000	0.0027	0.0027	0.1533	
13	650	0.0000	0.0021	0.0021	0.2100	
14	700	0.0000	0.0003	0.0003	0.1314	
15	750	0.0000	0.0018	0.0018	0.1500	
16	800	0.0000	0.0012	0.0012	0.1150	
17	850	0.0000	0.0009	0.0009	0.1324	
18	900	0.0000	0.0009	0.0009	0.1022	
19	950	0.0000	0.0015	0.0015	0.1184	
20	1000	0.0000	0.0003	0.0003	0.0920	
21	1050	0.0000	0.0009	0.0009	0.1071	
22	1100	0.0000	0.0006	0.0006	0.0836	
23	1150	0.0000	0.0012	0.0012	0.0978	
24	1200	0.0000	0.0003	0.0003	0.0767	
25	1250	0.0000	0.0009	0.0009	0.0900	
26	1300	0.0000	0.0003	0.0003	0.0708	
27	1350	0.0000	0.0006	0.0006	0.0833	
28	1400	0.0000	0.0003	0.0003	0.0657	
29	1450	0.0000	0.0006	0.0006	0.0776	
30	1500	0.0000	0.0003	0.0003	0.0613	
31	1550	0.0000	0.0003	0.0003	0.0726	
32	1600	0.0000	0.0003	0.0003	0.0575	
33	1650	0.0000	0.0003	0.0003	0.0682	
34	1700	0.0000	0.0003	0.0003	0.0541	
35	1750	0.0000	0.0003	0.0003	0.0643	
36	1800	0.0000	0.0003	0.0003	0.0511	
37	1850	0.0000	0.0003	0.0003	0.0608	
38	1900	0.0000	0.0003	0.0003	0.0484	
39	1950	0.0000	0.0003	0.0003	0.0577	
40	2000	0.0000	0.0003	0.0003	0.0460	

5 Voltage Fluctuations and Flicker Measurement

5.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

5.2 Test Configuration and Procedure



- The EUT was set in series with the Power Analyzer through an Impedance Network for the measurement of Flicker Voltage.
- The supply voltage and frequency setting on the Programmable AC Source was programmed as the rated voltage and frequency of the EUT.
- The measurement was automatically performed by test software. The test result was collected and analyzed by the computer.

5.3 EUT Operation Condition

Environment Condition

Temperature	Humidity	Atmospheric Pressure
26℃	44%RH	1004mbar

5.4 Test Limit

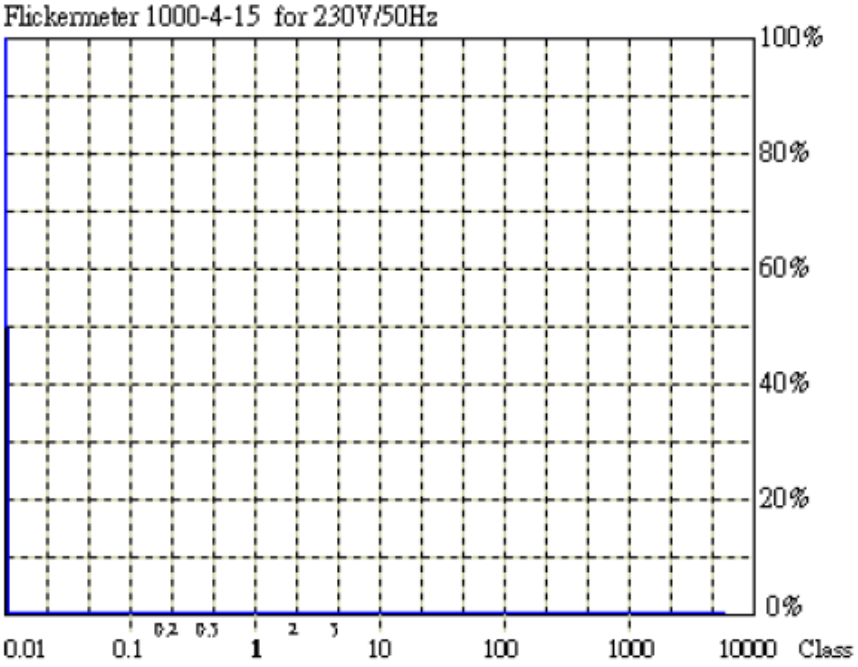
Test Item	Limit	Remark
P_{st}	1.0	P_{st} means short-term flicker indicator. T_p=10 min
P_{lt}	0.65	P_{lt} means long-term flicker indicator. T_p=2 hrs
d_t (%)	3.3	For more than 500ms
d_{max} (%)	4	d_{max} means relative maximum voltage change.
d_c (%)	3.3	d_c means relative steady-state voltage change.

5.5 Test Result

PASS

The measured result is shown on the following page(s).

Flickermeter 1000-4-15 for 230V/50Hz



Actual Flicker (Fli):	**0.00**
Short-term Flicker (Pst):	**0.07**
Limit (Pst):	1.00
Long-term Flicker (Plt):	**0.07**
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	**0.00%**
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	**0.00%**
Limit (dc):	3.30%
Maximum Interval exceeding 3.30% (dt):	**0.00ms**
Limit (dt>Lim):	500ms

```
Urms =  225.8V  Freq =  49.987  Range:  5 A
Irms =  1.506A  Ipk  =  2.158A  cf    =  1.433
P    =  334.6W  S    =  340.1VA pf    =  0.984

Test - Time :   1 x 1min = 1min ( 100 %)

LIN (Line Impedance Network) :   L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits :        Plt  :  0.65    Pst   : 1.00
                dmax :  4.00 %  dc    : 3.30 %
                dtLim:  3.30 %  dt>Lim: 500ms

Test completed, Result: PASSED

Plt  =  0.072

        Pst     dmax    dc      dt>Lim
                [%]     [%]     [ms]
1       0.072   0.000   0.000   0.000
```

6 Electrostatic Discharge Immunity Test

6.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

6.2 Test Configuration and Procedure

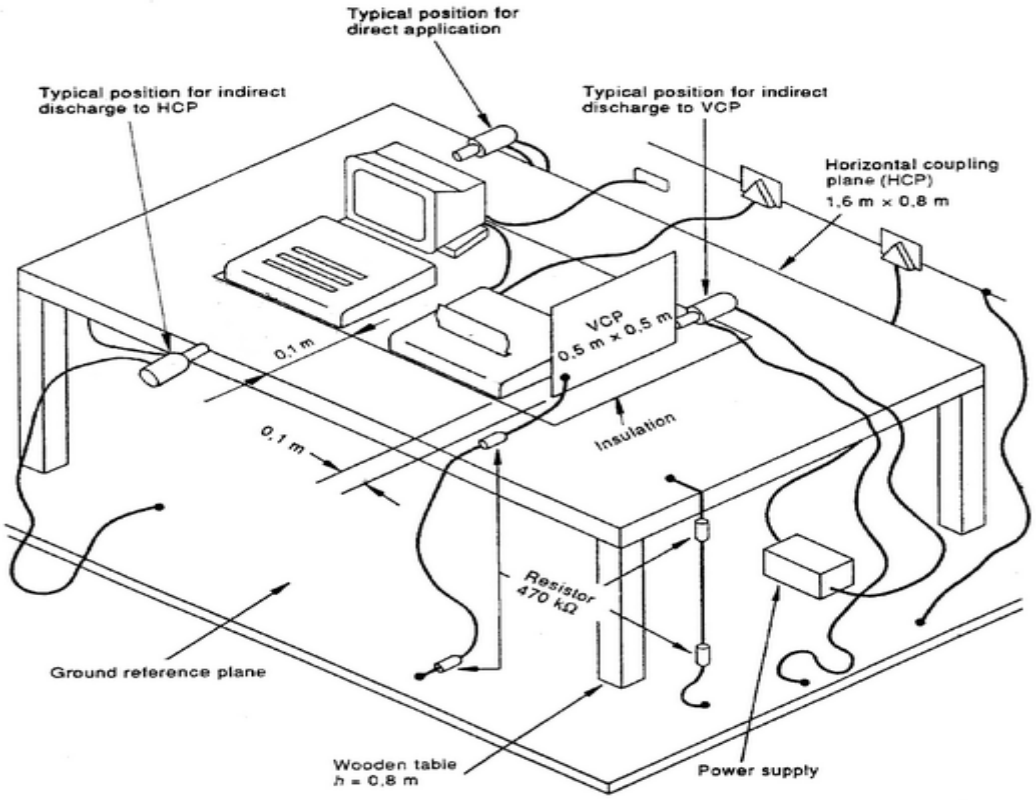


Table-top Equipment

- The EUT was located on a 0.8 m high wooden table standing on the ground reference plane with a 1.6 * 0.8 m horizontal coupling plane on the top. The EUT and cables was isolated from the coupling plane by an insulating support 0.5 mm thick.
- In Contact Discharge, the EUT was exposed to minimum 200 discharges, 100 each at negative and positive polarity on the selected test points (the selected test points were marked with red labels on the EUT)
- In Air Discharge, the EUT exposed to minimum of 10 single discharges on the selected test points.
- The result was observed and analyzed.

6.3 Test Result

6.3.1 Environment Condition

Temperature	Humidity	Atmospheric Pressure
22℃	51%RH	1001mbar

6.3.2 Observation of Direct Discharge

Test Points: 1. Surface of Case. 2. Junction of Case. 3. Data Port

Type of Discharge	Test Specifications				Performance Required by EN62040-2	Observed Result	Verdict
	Test Level	Polarity	Test Point	Number of Discharge			
Air Discharge	2,4,8 (kV)	±	1~3	20/ per point	B	A	Pass
Contact Discharge	2,4 (kV)	±	1~3	20/ per point	B	A	Pass
Remarks	1. No temporary degradation or loss of function has been observed throughout the entire time interval of air discharge. 2. No temporary degradation or loss of function has been observed throughout the entire time interval of contact discharge.						

6.3.3 Observation of Indirect Discharge

Test Points: 1. Front Side. 2. Rear Side. 3. Left Side. 4. Right Side.

Type of Discharge	Test Specifications				Performance Required by EN62040-2	Observed Result	Verdict
	Test Level	Polarity	Test Point	Number of Discharge			
HCP Application	2,4 (kV)	±	1~4	20/ per point	B	A	Pass
VCP Application	2,4 (kV)	±	1~4	20/ per point	B	A	Pass
Remarks	1. No temporary degradation or loss of function has been observed throughout the entire time interval of HCP application. 2. No temporary degradation or loss of function has been observed throughout the entire time interval of VCP application.						

PASS

The test result shows that the EUT is in compliance with the test performance criteria specified in EN 62040-2.

7 Radio-frequency, Electromagnetic Field Immunity Test

7.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

7.2 Test Configuration and Procedure

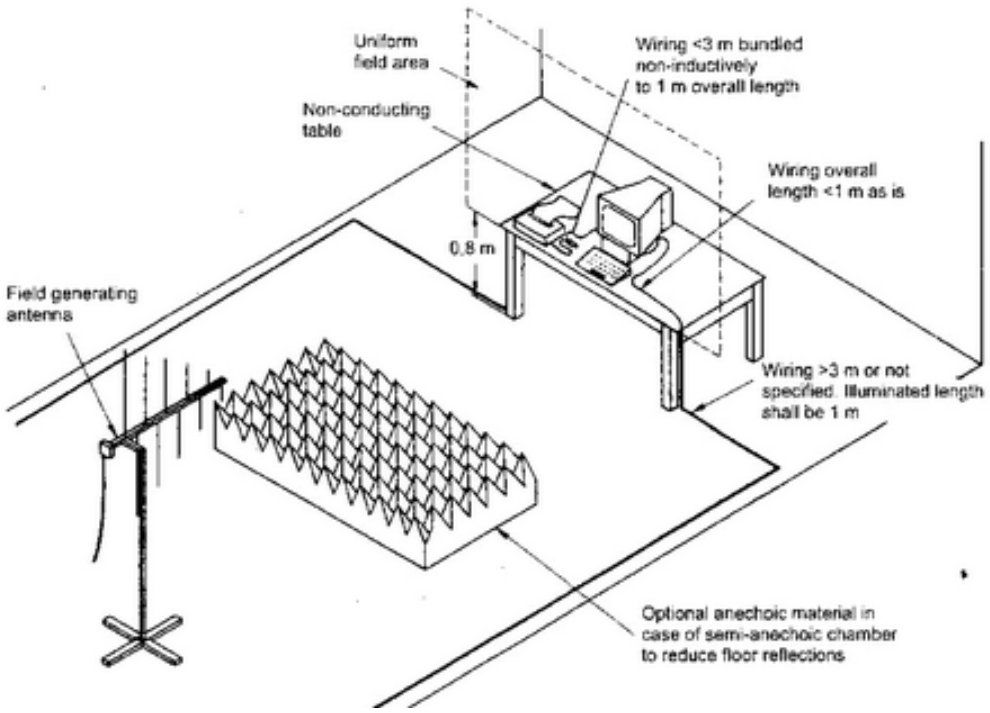


Table-top Equipment

- The field calibration was executed to create a uniform field area (UFA), 3 m away from the antenna, to ensure the validity of the test results.
- The EUT was placed on a non-conductive table 0.8 m high in the UFA.
- The EUT was then connected to power and signal wires according to relevant installation instruction.
- The EUT was positioned so that the four sides of the EUT were exposed to the electromagnetic field in sequence. In each position, the performance of the EUT was investigated and monitored by a CCD camera..

7.3 Test Result

7.3.1 Environment Condition

Temperature	Humidity	Atmospheric Pressure
22℃	51%RH	1001mbar

7.3.2 Observation of Test

Type of Modulation	Test Specifications			Performance Required by EN62040-2	Observed Result	Verdict
	Field Strength	Frequency Range	Modulation			
Amplitude Modulation	3V/m	80 to 1000MHz	80%, 1KHz, sinusoidal	A	A	Pass
Remark	No temporary degradation or loss of function has been observed throughout the entire test.					

PASS

The test result shows that the EUT is in compliance with the test performance criteria specified in EN 62040-2.

8 Electrical Fast Transient Test

8.1 Test Instrument

Refer to Sec. 1.2 Test Instruments.

8.2 Test Configuration and Procedure

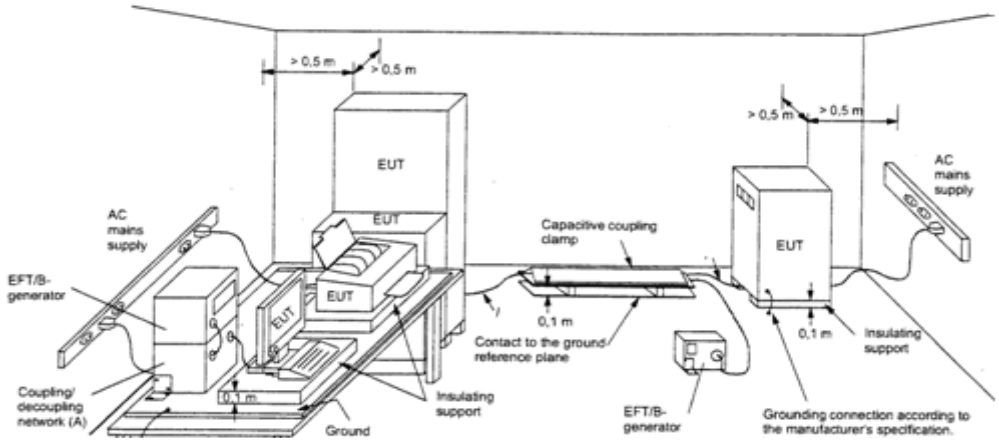


Table-top Equipment

- The EUT was placed on a table of 0.8 m height above the 1 * 1 m metallic ground reference plane, which projected beyond the EUT by at least 0.1 m on all sides.
- The ground plane was connected to the protective earth.
- The distance between the EUT and all other conductive structures, except the ground plane beneath the EUT was more than 0.5 m.
- The length of the signal and power lies between the coupling device and the EUT was 0.5 m.
- All cables to the EUT were placed on the insulation support 0.1 m above the ground reference plane.
- The EUT was connected to the power mains through a coupling device that directly coupled the EFT interference signal. Each of the Line, Neutral and Protective Earth conductors was injected with burst for 1 minute. The test time was broken down into six 10 s bursts separated by a 10 s pause for avoiding synchronization. Both voltage polarities were applied for each test

8.3 Test Result

8.3.1 Environment Condition

Temperature	Humidity	Atmospheric Pressure
22℃	51%RH	1001mbar

8.3.2 Observation of Power Supply Port

Coupling Selection	Test Specifications				Performance Required by EN 62040-2	Observed Result	Verdict
	Voltage (kV)	Test Duration (Sec)	Repetition Rate (kHz)	Tr/ Td (nS)			
L	±1	60	5	5/50	B	A	Pass
N	±1	60	5	5/50	B	A	Pass
PE	±1	60	5	5/50	B	A	Pass
L + N	±1	60	5	5/50	B	A	Pass
L + PE	±1	60	5	5/50	B	A	Pass
N + PE	±1	60	5	5/50	B	A	Pass
L + N +PE	±1	60	5	5/50	B	A	Pass
Remark	No temporary degradation or loss of function has been observed throughout the entire test.						
Note	Phase Shifting:0º,90º,180º,270º,360º						

8.3.3 Observation of I/O, communication ports (Applicable only to cable length >3m)

There was no I/O and communication cable longer than 3 meter; therefore, no test has been required.

PASS

The test result shows that the EUT is in compliance with the test performance criteria specified in EN 62040-2.

9 Surge Immunity Test

9.1 Test Instrument

Refer to Sec. 1.2 Test Instruments.

9.2 Test Configuration and Procedure

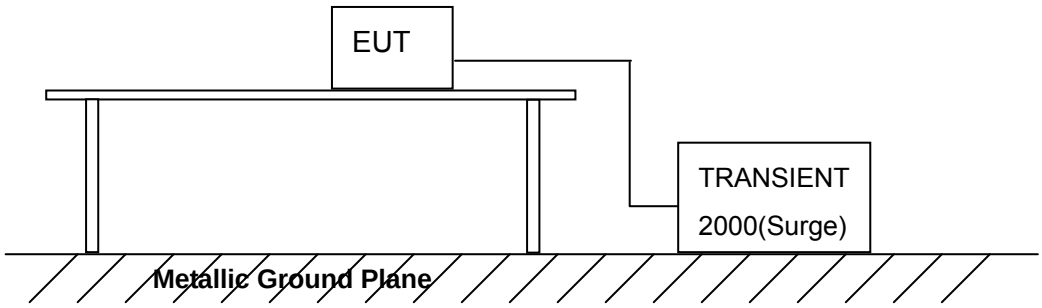


Table-top Equipment

- The EUT was placed on a table of 0.8 m height above the 1 * 1 m metallic ground reference plane, which projected beyond the EUT by at least 0.1 m on all sides.
- The ground plane was connected to the protective earth.
- The length of power cord between the coupling device and the EUT is less than 2 m (provided by the manufacturer).
- The EUT was connected to the power mains through a coupling device that directly couples the Surge interference signal. The surge noise was applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).
- The surges were applied line to line and line(s) to earth. When testing line to earth the test voltage was applied successively between each of the lines and earth. Steps up to the test level specified increased the test voltage. All lower levels including the selected test level were tested. The polarity of each surge level included positive and negative test pulses.
- Operating condition was shown on the monitor and observed.

9.3 Test Result

9.3.1 Environment Condition

Temperature	Humidity	Atmospheric Pressure
22℃	51%RH	1001mbar

9.3.2 Observation of Power Supply Port

Coupling Selection	Test Specifications			Performance Required by EN 62040-2	Observed Result	Verdict
	Voltage (kV)	Min. of Surge at Each Polarity	Repetition Rate (per min)			
L ►N	±0.5, 1	5	1	B	A	Pass
L ►PE	±0.5, 1,2	5	1	B	A	Pass
N ►PE	±0.5, 1,2	5	1	B	A	Pass
Remark	No temporary degradation or loss of function has been observed throughout the entire test.					

9.3.3 Observation of other supply/ signal lines: (Applicable only to ports which according to the manufacturer's specification may connect directly to outdoor cables)

N/A

PASS

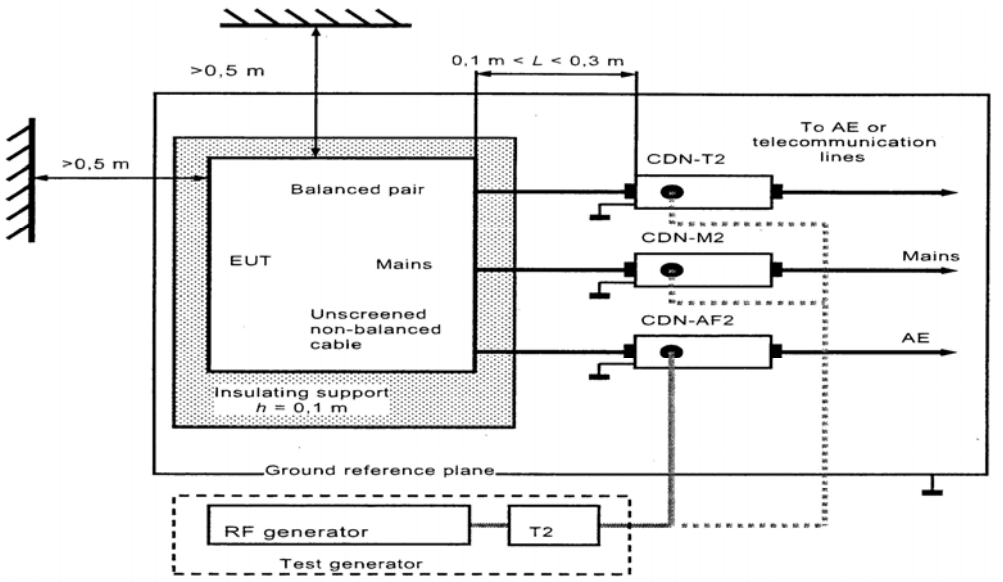
The test result shows that the EUT is in compliance with the test performance criteria specified in EN 62040-2.

10 Radio-frequency, Conducted Disturbances Immunity Test

10.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

10.2 Test Configuration and Procedure



- The EUT was placed on an insulating support of 0.1 m height above a ground reference plane. All cables exiting the EUT was supported at a height of 30 mm above the ground reference plane.
- The EUT was connected to the power mains through a Coupling and Decoupling Networks (CDN).
- The CDN was located 0.3 m from the EUT as indicated in the diagram above.
- The test was performed with the test generator connected to each of the CDN in turn while the other non-excited RF input ports of the coupling devices were terminated by a 50 Ω terminator.
- The conducted disturbance was applied on the EUT from 150 kHz to 80 MHz using the signal levels established during the setting process. .
- Operating condition was shown on the monitor and observed.

10.3 Test Result

10.3.1 Environment Condition

Temperature	Humidity	Atmospheric Pressure
22℃	51%RH	1001mbar

10.3.2 Observation of Test

Type of Modulation	Test Specifications			Performance Required by EN 62040-2	Observed Result	Verdict
	Voltage Level (emf) U_0	Frequency Range	Modulation			
Amplitude Modulation	3V/ 130dBμV	0.15 to 80MHz	80%, 1kHz, sinusoidal	A	A	Pass
Remark	No temporary degradation or loss of function has been observed throughout the entire test.					
Note	Phase Shifting:0º,90º,180º,270º,360º					

10.3.3 Observation of I/O, communication ports (Applicable only to cable length >3m)

There was no I/O and communication cable longer than 3 meter; therefore, no test has been required.

PASS

The test result shows that the EUT is in compliance with the test performance criteria specified in EN 62040-2.

11 Power Frequency Magnetic Field Immunity Test

11.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

11.2 Test Configuration and Procedure

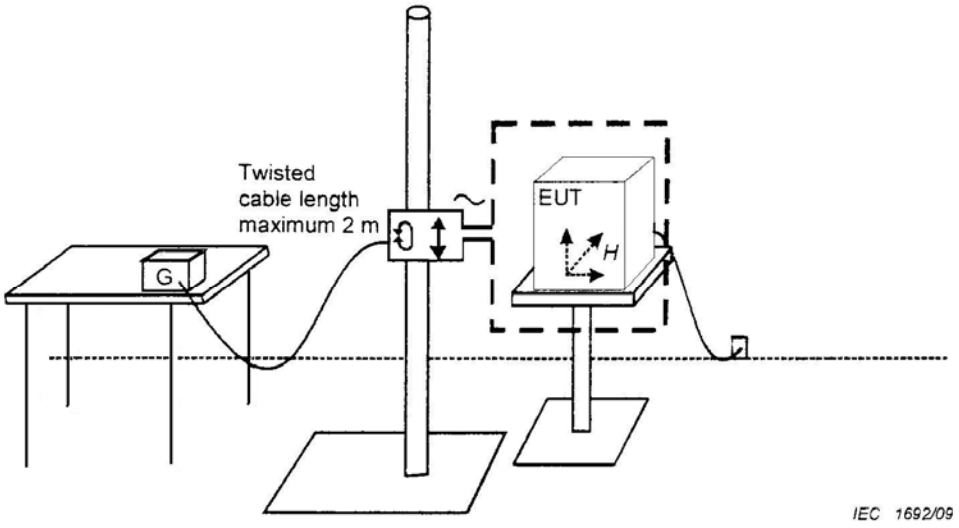


Table-top Equipment

- The EUT was placed on a non-magnetic metal ground plane of 0.25 mm thickness with the interposition of a 0.1 m thickness insulating support. The ground plane was connected to the protected earth.
- The EUT was placed at the center of the 1 * 1 m induction coil with the test generator placed within 3 m distance.
- The test was operated by moving and shifting the induction coil to expose to the test field.
- The operation condition was observed and analyzed.
- The induction coil was then rotated by 90° to expose the EUT to the test field with different orientations and the same procedure.

11.3 Test Result

11.3.1 Environment Condition

Temperature	Humidity	Atmospheric Pressure
22℃	51％RH	1001mbar

11.3.2 Observation of Test

Level (A/m)	Frequency (Hz)	Performance Required by EN62040-2	Observed Result	Verdict
10	50	B	A	Pass
Remark	No temporary degradation or loss of function has been observed throughout the entire test.			

PASS

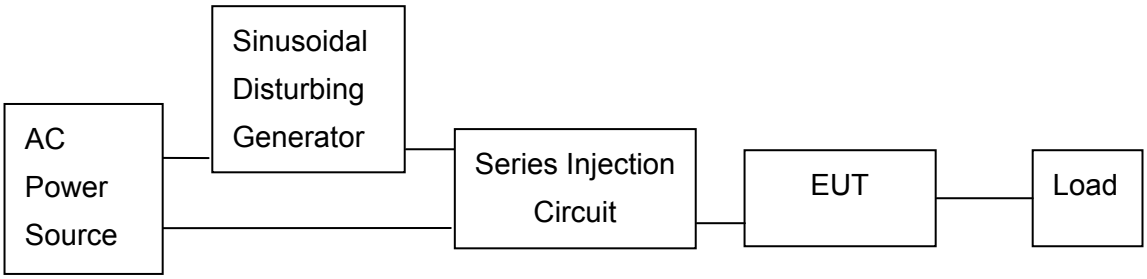
The test result shows that the EUT is in compliance with the test performance criteria specified in EN 62040-2.

12 Low Frequency Signals Immunity Test

12.1 Test Instrument

Refer to Sec. 1.2 Test Instruments.

12.2 Test Configuration and Procedure



- Let U.P.S. to be under charging and line status
- Adjust programmable AC source to output a 10Vrms (sine wave from 140 to 360Hz) that can be induced 10Vrms to link between AC source and U.P.S.(through the isolation transformer).
- The induced signals shall mixed in normal AC source and U.P.S. shall withstand it and no performances shall be reduced

12.3 Test Result

12.3.1 Environment Condition

Temperature	Humidity	Atmospheric Pressure
22℃	51%RH	1001mbar

12.3.2 Observation

Frequency Range (Hz)	Strength	Required by EN 62040-2	Observed Result	Verdict
140~360	10V (rms) Sinusoidal	A	A	Pass
Remark: No temporary degradation or loss of function has been observed throughout the entire test.				

PASS

The test result shows that the EUT is in compliance with the test performance criteria specified in EN 62040-2.

13 Photographs of Test

13.1 Power Line Conducted Test

Front View

Rear View

13.2 Radiated Emission Test

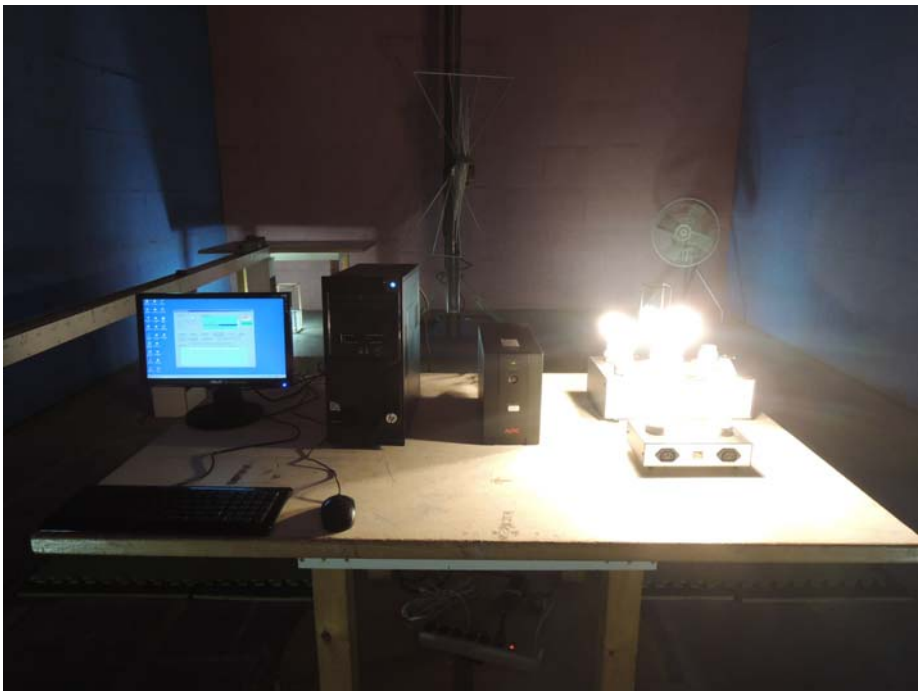
Front View

Rear View

13.3 Harmonic Current & Voltage Fluctuations and Flicker Measurement

13.4 Electrostatic Discharge Immunity Test

13.5 Radio-frequency, Electromagnetic Field Immunity Test

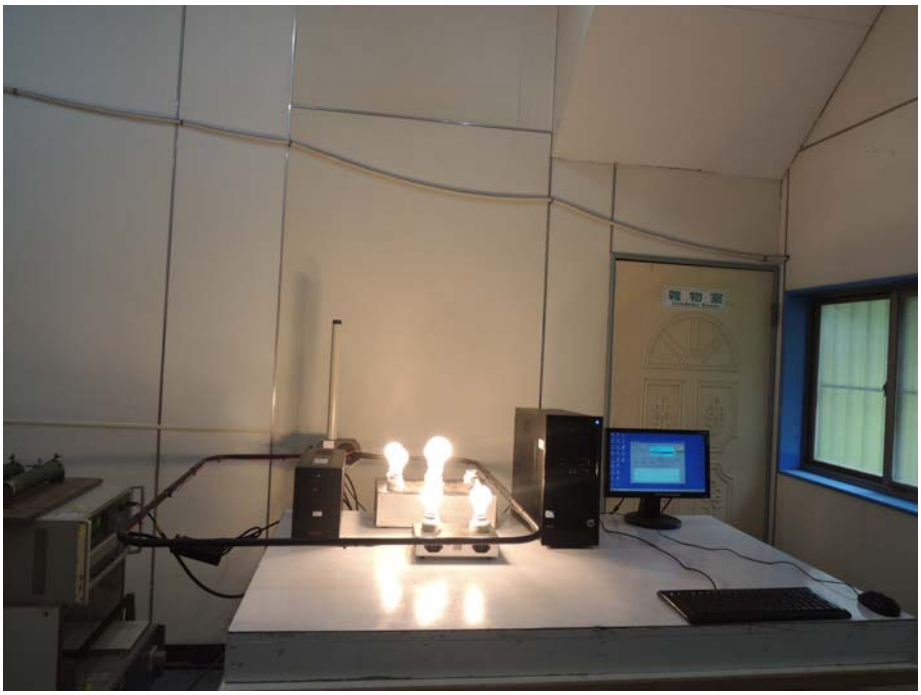


13.6 Electrical Fast Transient / Burst Immunity Test

13.7 Surge Immunity Test

13.8 Radio-frequency, Conducted Disturbances Immunity Test

13.9 Power Frequency Magnetic Field Immunity Test



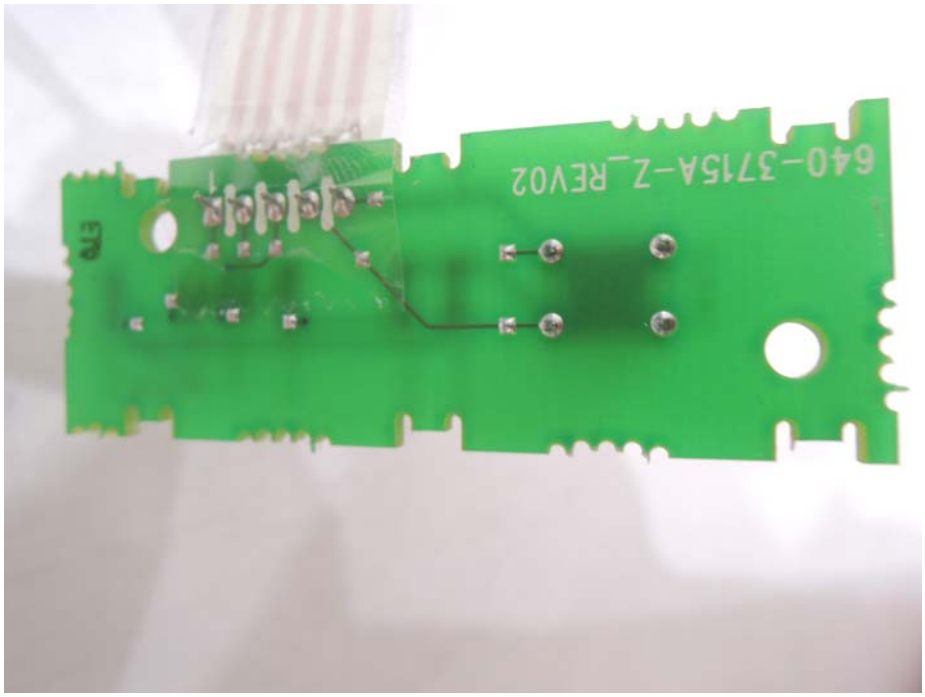
13.10 Low Frequency Signals Immunity Test

14 Photographs of EUT

Front View of the EUT

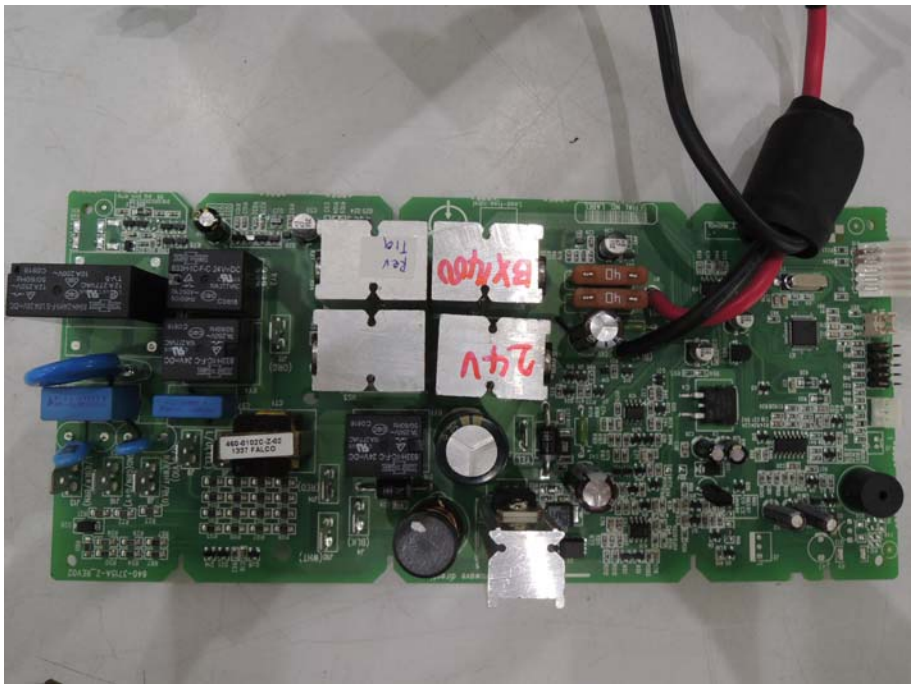
Rear View of the EUT

Inside View of the EUT

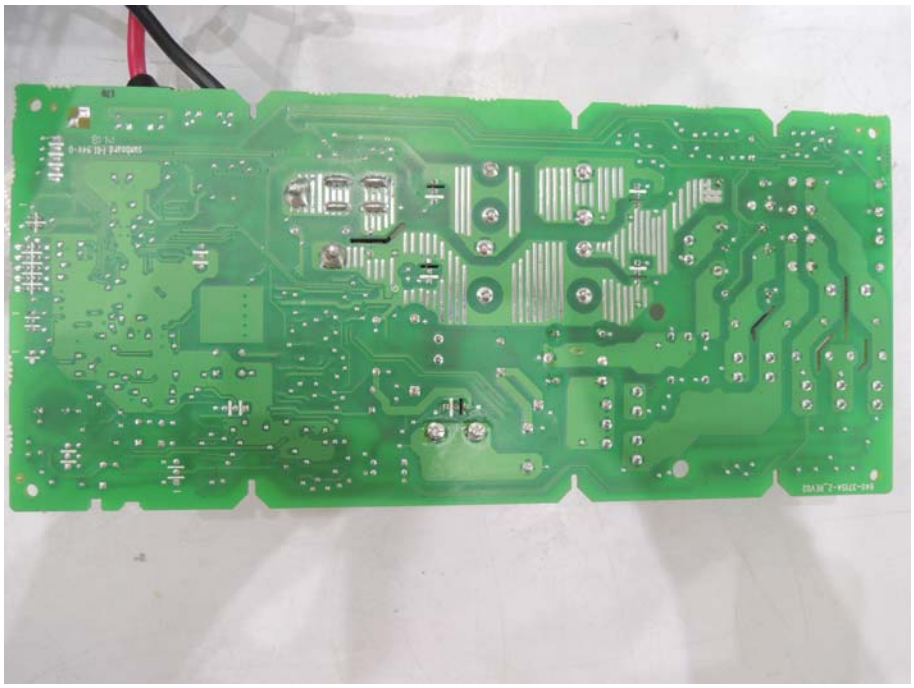


Front View of the PCB 1

Rear View of the PCB 1

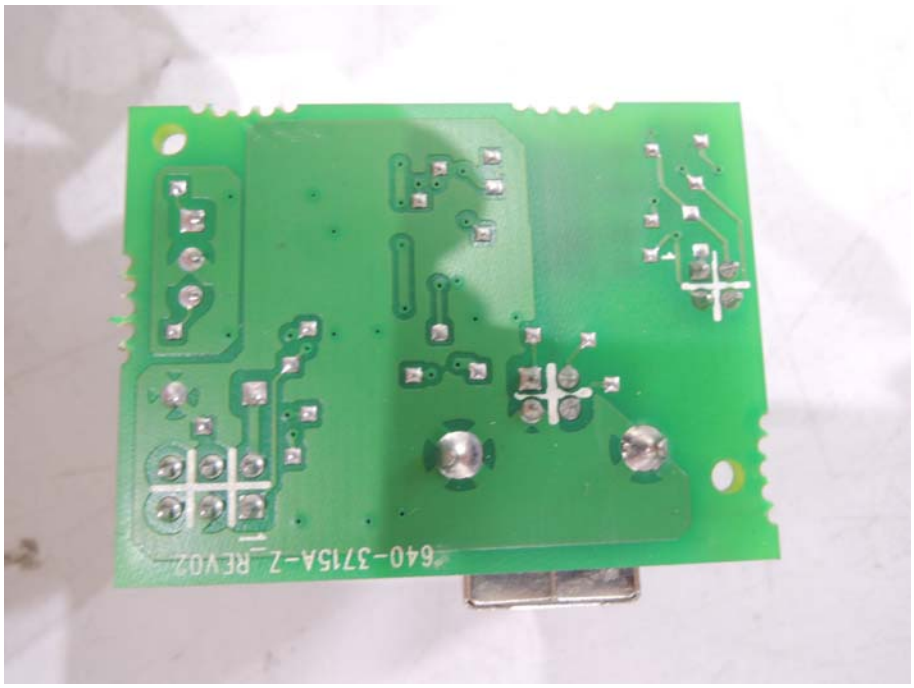


Front View of the PCB 2

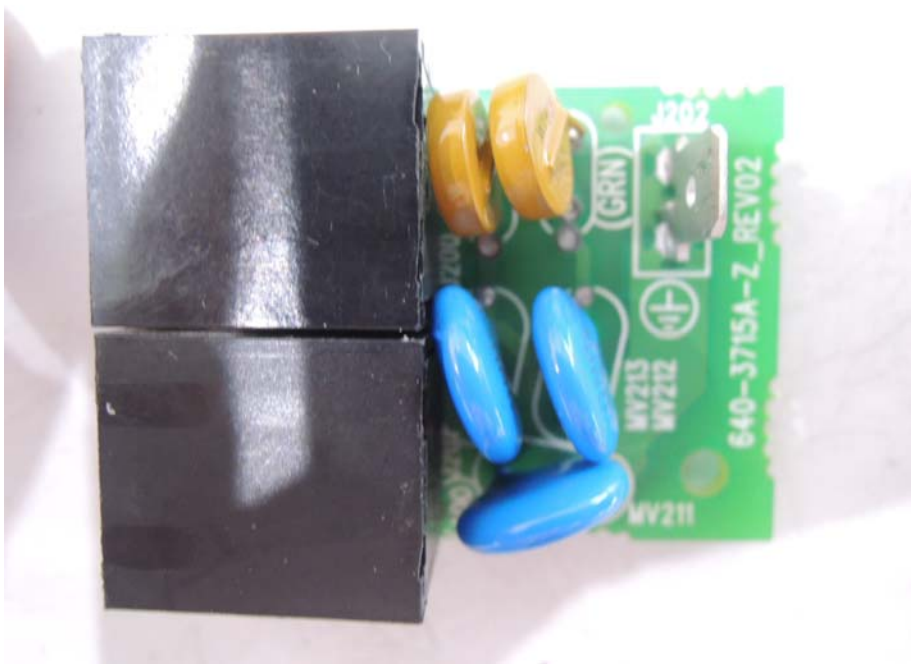


Rear View of the PCB 2

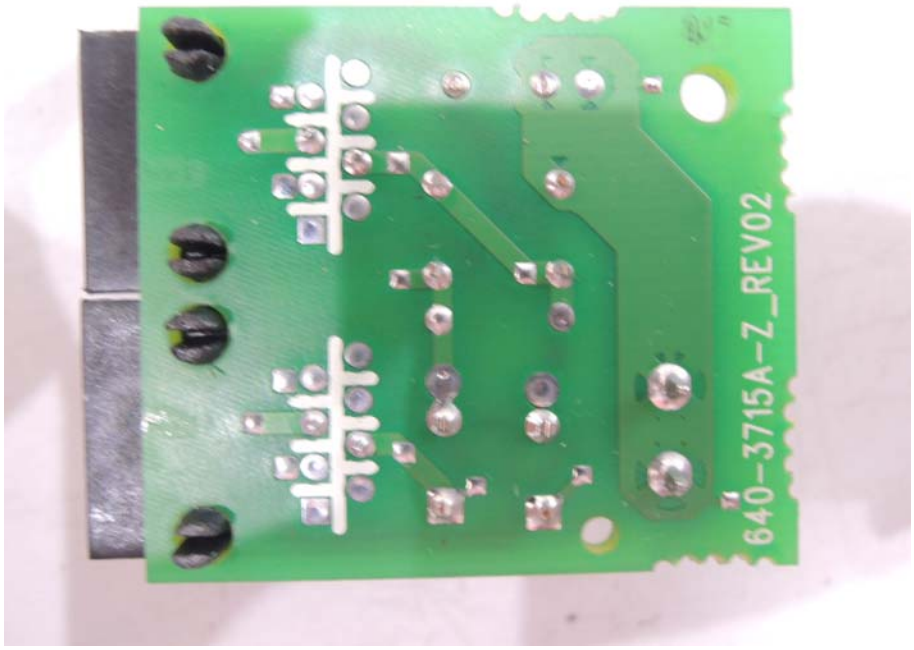
Front View of the PCB 3



Rear View of the PCB 3



Front View of the PCB 4



Rear View of the PCB 4

Front View of the Battery

Rear View of the Battery

View of the Battery label

15 Photographs of ESD Test Points

View of ESD Test Points

View of ESD Test Points