



EMC COMPLIANCE TEST REPORT

The product

Equipment Under Test	: UPS
Model Number	: BR900MI
Product Series	: BR650MI, BR900MIyyyyyyyyy, BR650MIyyyyyyyyy (y can be any alphanumeric, +, *, #, _, - or blank)
Report Number	: HA220371-CE
Issue Date	: 24-Jun-2022

is produced by

American Power Conversion Holdings Inc. Taiwan Branch
5F, No. 189, Sec 2, Jiuzong Rd., Neihu Dist., Taipei, Taiwan



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Release control Record

Report Version	Description	Issued Date
V00	Original release.	24-Jun-2022



Verification

Applicant : American Power Conversion Holdings Inc. Taiwan Branch
Manufacturer : American Power Conversion Holdings Inc. Taiwan Branch
Equipment Under Test : UPS
Model Number : BR900MI
Product Series : BR650MI, BR900MIyyyyyyyyy, BR650MIyyyyyyyyy
(y can be any alphanumeric, +, *, #, _, - or blank)
Sample Received Date : 19-May-2022
Test Result : Complied
Test Standard :

Emission:	Immunity:
<input checked="" type="checkbox"/> EN IEC 62040-2:2018 Environment : First Classification of EUT : Category C1 <input checked="" type="checkbox"/> EN IEC 61000-3-2:2019+A1:2021	<input checked="" type="checkbox"/> EN IEC 62040-2:2018 Environment : First Classification of EUT : Category C1 <input checked="" type="checkbox"/> IEC 61000-4-2:2008 <input checked="" type="checkbox"/> IEC 61000-4-3:2020 <input checked="" type="checkbox"/> IEC 61000-4-4:2012 <input checked="" type="checkbox"/> IEC 61000-4-5:2017 <input checked="" type="checkbox"/> IEC 61000-4-6:2013 <input checked="" type="checkbox"/> IEC 61000-4-8:2009 <input checked="" type="checkbox"/> IEC 61000-2-2:2002+A1:2017+A2:2018

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 IEC 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:

Sherry Yeh

Date:

24-Jun-2022

Tested by:

Andrew Lin

Date:

16-Jun-2022

Approved by:

Adam Yang

Date:

24-Jun-2022



Summary of Test Result - Emission

Emission			
Test Standard	Test Item	Test Result	Remark
EN IEC 62040-2 Category C1	Conducted emission at mains terminal	Pass	Highest Emission-(LINE mode) L: 20.594MHz, Q.P.32.46dBuV, Margin -27.54 dB N: 21.260MHz, Q.P36.20dBuV, Margin -23.80 dB
			Highest Emission-(Battery mode) L: 0.312MHz, Q.P.43.39dBuV, Margin -16.54 dB N: 0.189MHz, Q.P44.74dBuV, Margin -19.32 dB
EN IEC 62040-2 Category C1	Conducted emission at network port	Pass	RJ45 Port is not a network function.
EN IEC 62040-2 Category C1	Radiated Emission	Pass	Highest Emission-(LINE mode) H: 333.740MHz, 33.93dBuV, Margin -3.07 dB Antenna Height 395 cm, Turntable Angle 120° V: 71.520MHz, 25.36dBuV, Margin-4.64 dB Antenna Height 114 cm, Turntable Angle 105°
			Highest Emission-(Battery mode) H: 191.850MHz, 25.72dBuV, Margin -4.28 dB Antenna Height 389 cm, Turntable Angle 105° V: 38.360MHz, 22.16dBuV, Margin-7.84 dB Antenna Height 115 cm, Turntable Angle 100°
EN IEC 61000-3-2	Harmonic	Pass	Refer to Page 30~31
<p>Remark:</p> <p>Since U_{Lab} of our lab is less than U_{CISPR}, no matter if determining compliance with the limits in this standard shall be based on the results of the compliance measurements taking into account the considerations on measurement instrumentation uncertainty or not, any adjustment of the test result is not necessary, which means,</p> <ul style="list-style-type: none">- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;- non-compliance is deemed to occur if measured disturbance level exceeds the disturbance limit. <p>N/A: Not Applicable.</p>			



Summary of Test Result – Immunity

Immunity (Environment : First / Classification of EUT : Category C1)				
Test Standard	Test Item	Performance Criteria	Observed Result Class	Test Result
IEC 61000-4-2	Electrostatic Discharge	B	A	Pass
IEC 61000-4-3	Radiated Susceptibility	A	A	Pass
IEC 61000-4-4	Electrical Fast Transient	B	A	Pass
IEC 61000-4-5	Surge	B	A	Pass
IEC 61000-4-6	Conducted Susceptibility	A	A	Pass
IEC 61000-4-8	Magnetic Field	B	A	Pass
IEC 61000-2-2	Low Frequency Signals Immunity Test	A	A	Pass
<p>Remark :</p> <p>According to the test standard, the uncertainty related to EMS test instrument calibration and test levels need not be recorded in the test report and shall not be taken into account.</p> <p>N/A: Not Applicable.</p>				



Measurement Uncertainty

Where relevant, the following measurement uncertainty levels has been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Test Item	Expanded Uncertainty (U_{lab})	Expanded Uncertainty (U_{cisp})
Conducted emission at AC mains power using a V-AMN, 9kHz – 150kHz	$\pm 2.94\text{dB}$	$\pm 3.8\text{dB}$
Conducted emission at AC mains power using a V-AMN, 150kHz – 30MHz	$\pm 3.05\text{dB}$	$\pm 3.4\text{dB}$
Conducted emission at telecommunication port using AAN, 150kHz – 30MHz	$\pm 4.71\text{dB}$	$\pm 5.0\text{dB}$
Conducted emission at telecommunication port using CVP and CP, 150kHz – 30MHz	$\pm 3.92\text{dB}$	$\pm 4.0\text{dB}$
	$\pm 3.10\text{dB}$	
Radiated emission, 30MHz – 1GHz (Horizontal)	$\pm 4.92\text{dB}$	$\pm 6.3\text{dB}$
Radiated emission, 30MHz – 1GHz (Vertical)	$\pm 5.05\text{dB}$	$\pm 6.3\text{dB}$
Radiated emission, 1GHz – 6GHz	$\pm 4.35\text{dB}$	$\pm 5.2\text{dB}$
Radiated emission, 6GHz – 18GHz	$\pm 4.77\text{dB}$	$\pm 5.5\text{dB}$
Radiated electromagnetic disturbances using a LLAS, 9kHz – 30MHz	$\pm 3.27\text{dB}$	$\pm 3.3\text{dB}$
Disturbance Power, 30MHz – 300MHz	$\pm 4.04\text{dB}$	$\pm 4.5\text{dB}$

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%.



1 General Description

1.1 Description of EUT

Equipment Under Test	:	UPS
Model Number	:	BR900MI
Product Series	:	BR650MI, BR900MIyyyyyyyyy, BR650MIyyyyyyyyy (y can be any alphanumeric, +, *, #, _, - or blank)
Applicant	:	American Power Conversion Holdings Inc. Taiwan Branch
Address of Applicant	:	5F, No. 189, Sec 2, Jiuzong Rd., Neihu Dist., Taipei, Taiwan
Manufacturer	:	American Power Conversion Holdings Inc. Taiwan Branch
Address of Manufacturer	:	5F, No. 189, Sec 2, Jiuzong Rd., Neihu Dist., Taipei, Taiwan
Power Supply	:	Input : AC 220-240V~, 4.3A, 50/60Hz Output : AC 220-240V~, 4.1A, 50/60Hz, 900VA, 540W Power output line*2 <input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Non-Shielded <input checked="" type="checkbox"/> Detachable, 1.5m <input type="checkbox"/> Un-Detachable <input type="checkbox"/> with Ferrite Core <input checked="" type="checkbox"/> without Ferrite Core Output cable length declared by the manufacturer in the user manual of not more than 10 m.
I/O Port	:	RJ45 IN,RJ45 Out, Data Port, Power output hole*6, power input , Tel Out Tel IN
Data Cable	:	N/A
Description of EUT	:	Dimensions : 31 cm (L) X 9 cm (W) X 19 cm (H) Position : <input checked="" type="checkbox"/> Table-top / <input type="checkbox"/> Floor-standing Environment : <input checked="" type="checkbox"/> First environment / <input type="checkbox"/> Second environment Category of Equipment : <input checked="" type="checkbox"/> C1 <input type="checkbox"/> C2 <input type="checkbox"/> C3 <input type="checkbox"/> C4 Intended Function : The EUT is a Uninterruptible Power System Product Variance : The manufacturer declares that the series products are identical to the main test sample. For marketing reason, there are different series numbers.



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

Conducted Emission					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESC17	100931	04-Aug-2021	03-Aug-2022
LISN	EMCO	3810/2NM	9702-1821	25-Jul-2021	24-Jul-2022
LISN	SCHWARZBEC K	NSLK 8127	01021	15-Sep-2021	14-Sep-2022
Cable	HongAn	RG 223/U	HA2-CE	20-Aug-2021	19-Aug-2022
Software	Audix	e3 (ver 6.101006a)	N/A	N/A	N/A
Radiated Emission Test					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESC17	100931	04-Aug-2021	03-Aug-2022
Preamplifier	SCHAFFNER	CPA 9231A	0405	17-Dec-2021	16-Dec-2022
Bilog Antenna(10m)	TESEQ	CBL6111D	47016	19-Jul-2021	18-Jul-2022
Cable	HongAn	8D-FB	HA2-10MSite	20-Aug-2021	19-Aug-2022
Software	Audix	e3 (ver 6.101006a)	N/A	N/A	N/A
Harmonic Current Emission					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
Signal conditioning unit	TESEQ	CCN 1000-1	1918A03073	02-Jul-2021	01-Jul-2022
AC Power Source	TESEQ	NSG 1007	1919A00280	02-Jul-2021	01-Jul-2022
Software	TESEQ	CTS4 (Version 4.29.0)	N/A	N/A	N/A
Electrostatic Discharge immunity test					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
Electrostatic Discharge Simulator	Noiseken	ESS-B3011	ESS1632985	25-Aug-2021	24-Aug-2022
Discharge Gun	Noiseken	GT-30RA	ESS2153540	25-Aug-2021	24-Aug-2022



Radiated, radio-frequency, electromagnetic field immunity test					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
Signal Generator	R&S	SMB100A	110549	06-Sep-2021	05-Sep-2022
RF Power Amplifier	ar	150W1000	0343919	N/A	N/A
RF Amplifier	ar	15S1G3	306578	N/A	N/A
Dual Directional Coupler	WERLATONE	C6021-10	108038	N/A	N/A
Directional Coupler	ATM	CHPsc22L-40	Q308504-01	N/A	N/A
Power Sensor	TESEQ	PM6003	074395	03-Aug-2021	02-Aug-2022
Power Sensor	TESEQ	PM6003	074396	03-Aug-2021	02-Aug-2022
Bilog Antenna	TESEQ	CBL6111D	58161	12-Jan-2022	11-Jan-2023
Horn Antenna	EMCO	3115	9912-5992	12-Jan-2022	11-Jan-2023
Broadband Field Meter	Narda	NBM-520	D-0519	16-Oct-2021	15-Oct-2022
Probe	Narda	EF-0691	D-0102	16-Oct-2021	15-Oct-2022
Software	Audix	i2 (Ver:20151112c)	N/A	N/A	N/A
Electrical fast transient/burst immunity test					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMCPro Plus EMC Test System	ThermoFisher	EMC Pro PLUS	1507189	18-May-2022	17-May-2023
Capacitor Clamp	ThermoFisher	CCL	1507182	18-May-2022	17-May-2023
Software	KeyTek	CEWare32 (ver 4.1)	N/A	N/A	N/A
Surge immunity test					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMCPro Plus EMC Test System	ThermoFisher	EMC Pro PLUS	1507189	18-May-2022	17-May-2023
Software	KeyTek	CEWare32 (ver 4.1)	N/A	N/A	N/A



Immunity to conducted disturbances, induced by radio-frequency fields					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
Signal Generator	R&S	SMB100A	110549	06-Sep-2021	05-Sep-2022
Wide Band Amplifier	ifi	CMX50	D019-0200	N/A	N/A
6dB Attenuator	BIRD	50-A-MFN-06	0048	N/A	N/A
Dual Directional Coupler	WERLATONE	C6021-10	108038	N/A	N/A
Power Sensor	TESEQ	PM6003	074395	03-Aug-2021	02-Aug-2022
Power Sensor	TESEQ	PM6003	074396	03-Aug-2021	03-Aug-2022
CDN	FCC	FCC-801-M3-32 A	2019	27-Jan-2022	26-Jan-2023
CDN	FCC	FCC-801-M3-32 A	20116	27-Jan-2022	26-Jan-2023
Software	Audix	i2 (ver 20151112c)	N/A	N/A	N/A
Power frequency magnetic field immunity test					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMCPro Plus EMC Test System	ThermoFisher	EMC Pro PLUS	1507189	18-May-2022	17-May-2023
Magnetic Field Immunity Loop	ThermoFisher	F-1000-4-8/9/10-L-1M	9953	18-May-2022	17-May-2023
Software	KeyTek	CEWare32 (ver 4.1)	N/A	N/A	N/A
Software	KeyTek	CEWare32 (ver 4.1)	N/A	N/A	N/A

※ 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 IEC 62040-2.

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

Deviations from the test standards as below description : N/A

1.5 Auxiliary Equipments

Provided by HongAn Technology Co., Ltd.

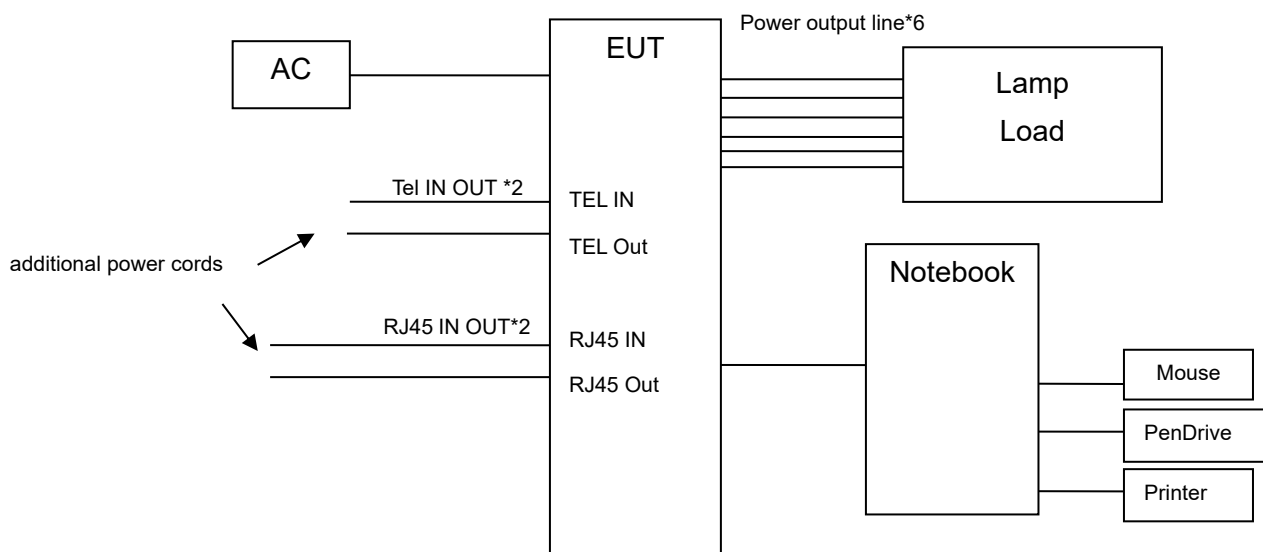
No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Description	
						Data Cable	Power Cable
1	Notebook	X542U	HBN0CV11S78 3465	CE Mark, FCC DoC, BSMI ID R31018	ASUS	N/A	Adapter to Notebook Input : AC 100-240V~50/60H z 1.6A Output : 19V 3.42A Non-shielded, Un-detachable, 2.2m, Without Core
2	Mouse	MO96UOB	96NO35688	CE Mark, FCC DoC, BSMI ID R41108	ASUS	Shielded(Foil) *1.8m	N/A
3	Pen Drive	8G-Micro USB+USB 2.0	N/A	CE Mark	Transcend	Shielded *1.0m	N/A
4	USB Printer	LaserJet Pro M12w	VNB6R20077	CE Mark, FCC DoC, BSMI ID R3A304	Hewlett Packard	Shielded(Braid) *1.8m	Unshielded *1.8m
5	LAMP*2	40W	N/A	N/A	N/A	N/A	N/A
6	LAMP	60W	N/A	N/A	N/A	N/A	N/A
7	LAMP*4	100W	N/A	N/A	N/A	N/A	N/A
8	RJ45 IN OUT*2	N/A	N/A	N/A	N/A	Non-shielded, Detachable, 1m With Core*1	N/A
9	Tel IN OUT*2	N/A	N/A	N/A	N/A	Non-shielded, Detachable, 1m Without Core	N/A
10	Power output line*4	N/A	N/A	N/A	N/A	Non-shielded, Detachable, 1m Without Core	N/A
11	Power input line	N/A	N/A	N/A	N/A	Non-shielded, Detachable, 1.5m Without Core	N/A

Provided by the Manufacturer

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Description	
						Data Cable	Power Cable
1	Power output line*2	N/A	N/A	N/A	N/A	Non-shielded, Detachable, 1.5m Without Core	N/A
2	Battery	GP1272F1	N/A	N/A	Hitachi Chemical	N/A	N/A



1.6 Block Diagram



1.7 Identifying the Final Test Mode

1. LINE mode (Full load).
2. Battery mode (Full load).

Note: The additional power cords do not increase the disturbance level by 2dB. Therefore the final EMC assessment was performed for the Line mode and Battery mode.

1.8 Final Test Mode

1. For Conducted Emission: choosing LINE Mode (Full load) and Battery Mode (Full load).
2. For Radiated Emission: choosing LINE Mode (Full load) and Battery Mode (Full load).
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.1.6 Block Diagram.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode.



1.11 Performance criteria for immunity tests

	Criterion A	Criterion B
External and internal indications and metering	Change only during test	Change only during test
Control signals to external devices	No change	Change only temporarily in consistence with the actual UPS mode of operation
Mode of operation ^a	No change	Change only temporarily
^a At all times, the UPS shall remain within the performance classification as declared by the UPS manufacturer (see EN IEC 62040-2:2018).		

1.11.1 Test Methodology

All Emission Tests were performed according to the procedures specified in EN IEC 62040-2. Radiated Emission Test was performed at 10 m distance from antenna to EUT. All Immunity Tests were performed according to the procedures specified in EN IEC 62040-2.

2 Conducted Emission Test

2.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

2.2 Test Arrangement and Procedure

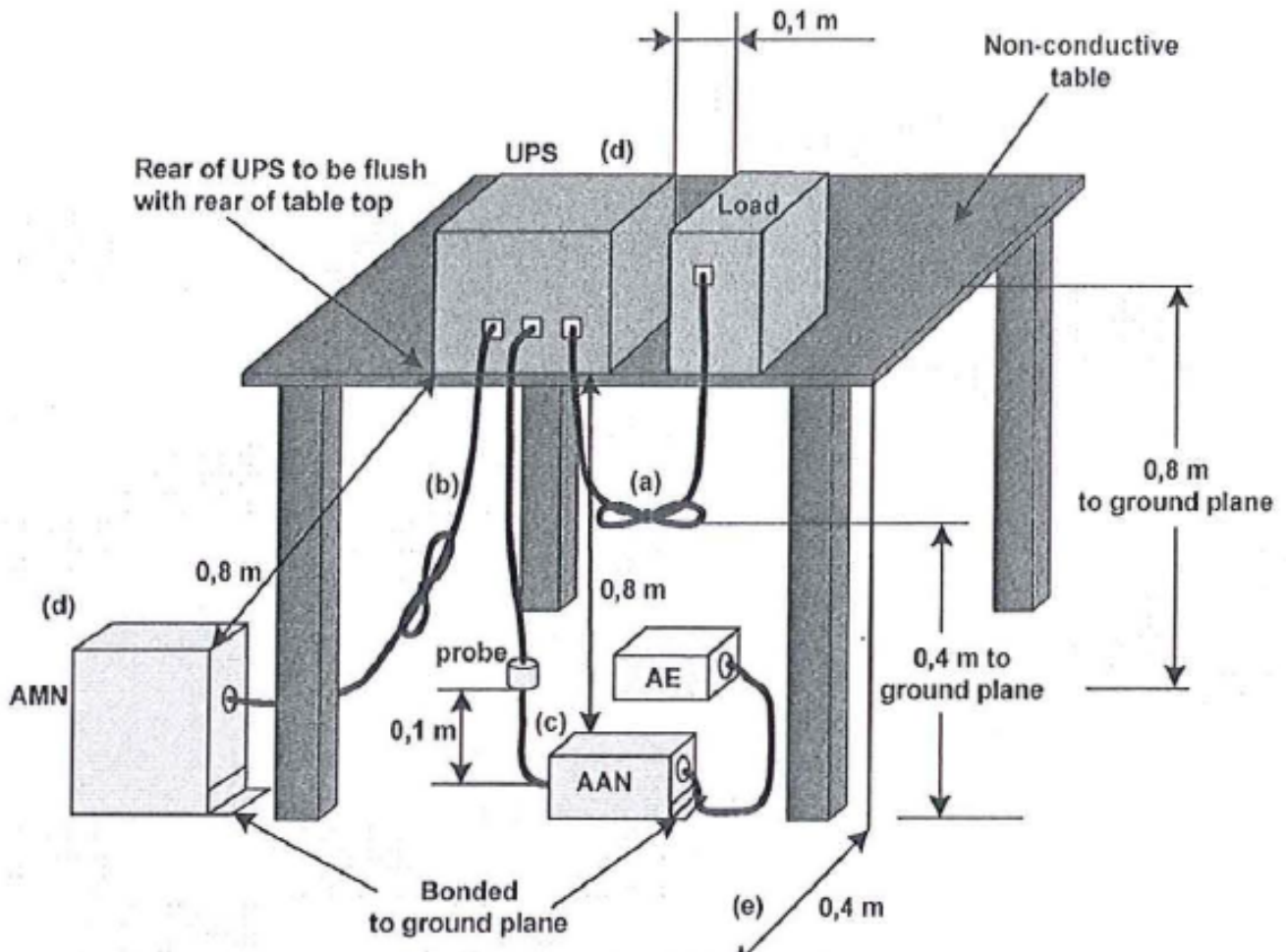


Table-top Equipment

- 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 μ H 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 IEC 62040-2

Limits of mains terminal and network port disturbance voltage for category C1 and category C2 UPS in the range 0.15 MHz to 30 MHz

Frequency Range (MHz)	Limits dB(μ V)							
	<input checked="" type="checkbox"/> Category C1 UPS				<input type="checkbox"/> Category C2 UPS			
	Mains terminal		Network port		Mains terminal		Network port	
	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.15 to 0.50 ^b	66 to 56 ^a	56 to 46 ^a	84 to 74 ^a	74 to 64 ^a	79	66	97 to 87 ^a	84 to 74 ^a
0.50 to 5 ^b	56	46	74	64	73	60	87	74
5 to 30	60	50			73	60		
a The limit decreases linearly with the logarithm of the frequency.								
b The lower limit shall apply at the transition frequency.								

Limits of mains terminal and network port disturbance voltage for category C3 UPS in the frequency range 0.15 MHz to 30 MHz

UPS rated output current A	Frequency range (MHz)	Limits dB(μ V)			
		Mains terminal		Network port	
		Quasi-Peak	Average	Quasi-Peak	Average
>16 - 100	0.15 to 0.50 ^b	100	90	110 to 100 ^a	94 to 84 ^a
	0.50 to 5.0 ^b	86	76	100	84
	5.0 to 30.0	90 to 73 ^a	80 to 60 ^a		
>100	0.15 to 0.50 ^b	130	120	110 to 100 ^a	94 to 84 ^a
	0.50 to 5.0 ^b	125	115	100	84
	5.0 to 30.0	115	105		
a The limit decreases linearly with the logarithm of the frequency.					
b The lower limit shall apply at the transition frequency.					

2.4 Test Result

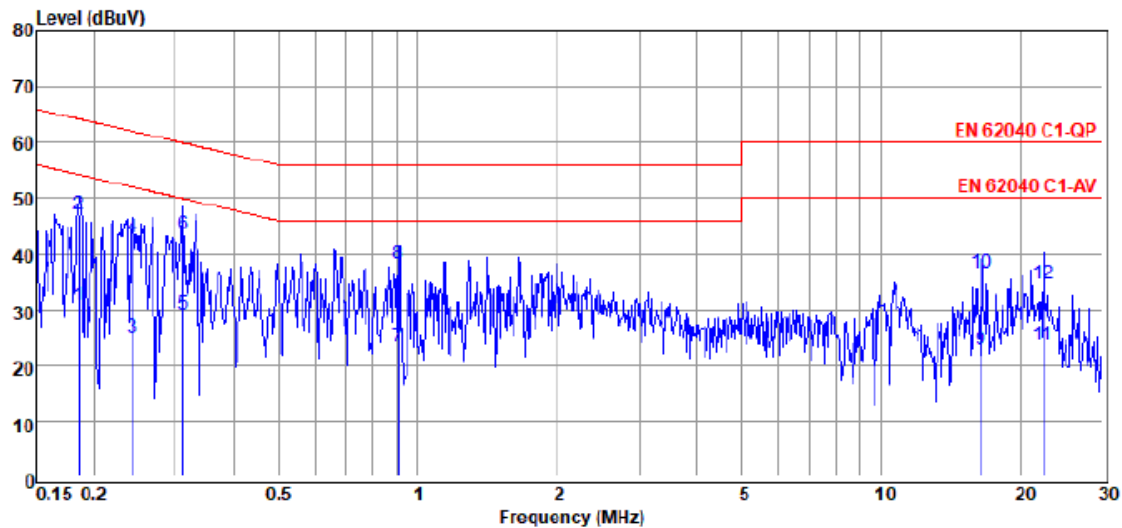
PASS

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

**Conducted Emission Test Data (at Mains Terminal)**

Test Site : HA2
Model Number : BR900MI
Power phase : LINE
Test Voltage : 230V/50Hz
Description : LINE mode

Test Date : 15-Jun-2022
Temperature : 25°C
Humidity : 60%RH
Test by : Andrew Lin

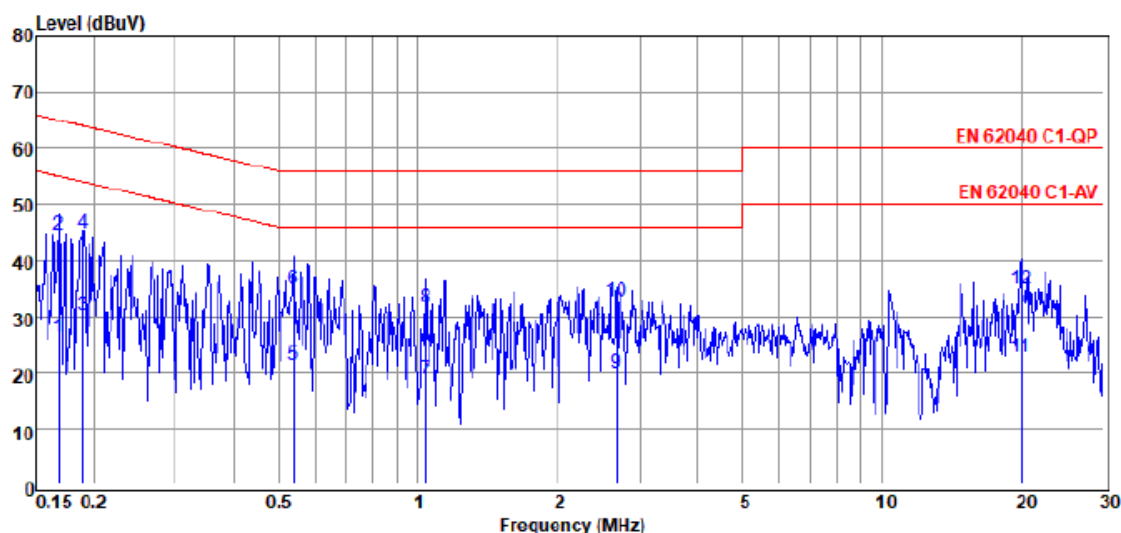


No.	Freq MHz	Reading dBuV	C.F dB	Result dBuV	Limit dBuV	Margin dB	Power Line	Remark
1	0.185	30.61	0.08	30.69	54.24	-23.55	LINE	Average
2	0.185	46.88	0.08	46.96	64.24	-17.28	LINE	QP
3	0.242	24.86	0.08	24.94	52.04	-27.10	LINE	Average
4	0.242	42.83	0.08	42.91	62.04	-19.13	LINE	QP
5	0.312	28.86	0.09	28.95	49.93	-20.98	LINE	Average
6	0.312	43.30	0.09	43.39	59.93	-16.54	LINE	QP
7	0.909	23.19	0.14	23.33	46.00	-22.67	LINE	Average
8	0.909	38.12	0.14	38.26	56.00	-17.74	LINE	QP
9	16.486	22.01	0.79	22.80	50.00	-27.20	LINE	Average
10	16.486	35.67	0.79	36.46	60.00	-23.54	LINE	QP
11	22.416	22.62	0.92	23.54	50.00	-26.46	LINE	Average
12	22.416	33.80	0.92	34.72	60.00	-25.28	LINE	QP

Remark : 1. All readings are Quasi-Peak and Average values.
2. Result = Reading + C.F..
3. Margin = Result – Limit.

**Conducted Emission Test Data (at Mains Terminal)**

Test Site : HA2
 Model Number : BR900MI
 Power phase : NEUTRAL
 Test Voltage : 230V/50Hz
 Description : LINE mode
 Test Date : 15-Jun-2022
 Temperature : 25°C
 Humidity : 60%RH
 Test by : Andrew Lin



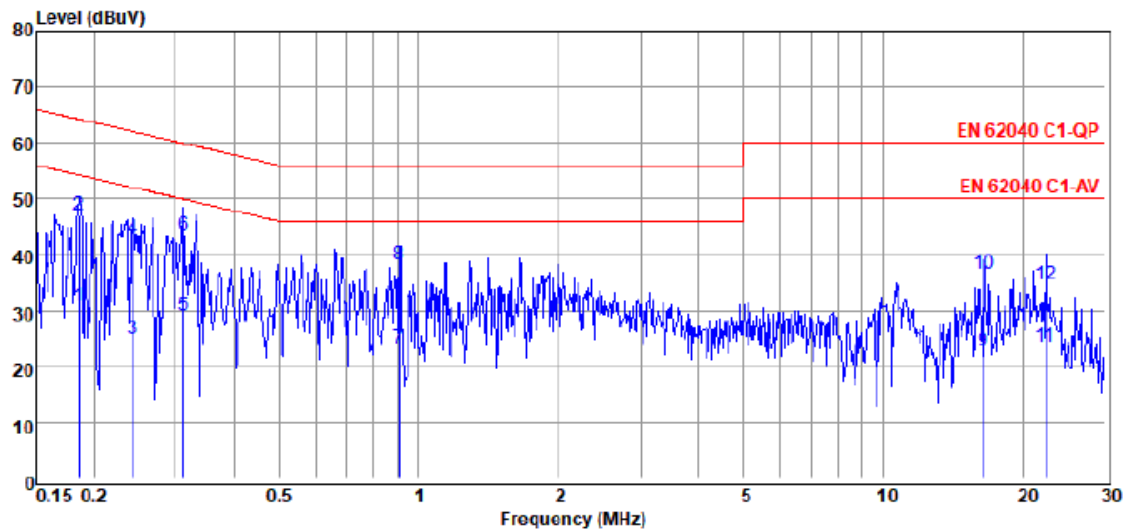
No.	Freq MHz	Reading dBuV	C.F dB	Result dBuV	Limit dBuV	Margin dB	Power Line	Remark
1	0.168	26.15	0.08	26.23	55.08	-28.85	NEUTRAL	Average
2	0.168	44.37	0.08	44.45	65.08	-20.63	NEUTRAL	QP
3	0.189	30.00	0.08	30.08	54.06	-23.98	NEUTRAL	Average
4	0.189	44.66	0.08	44.74	64.06	-19.32	NEUTRAL	QP
5	0.538	21.26	0.10	21.36	46.00	-24.64	NEUTRAL	Average
6	0.538	34.89	0.10	34.99	56.00	-21.01	NEUTRAL	QP
7	1.037	18.75	0.15	18.90	46.00	-27.10	NEUTRAL	Average
8	1.037	31.48	0.15	31.63	56.00	-24.37	NEUTRAL	QP
9	2.678	19.68	0.21	19.89	46.00	-26.11	NEUTRAL	Average
10	2.678	32.32	0.21	32.53	56.00	-23.47	NEUTRAL	QP
11	19.950	21.68	0.89	22.57	50.00	-27.43	NEUTRAL	Average
12	19.950	33.94	0.89	34.83	60.00	-25.17	NEUTRAL	QP

Remark : 1. All readings are Quasi-Peak and Average values.
 2. Result = Reading + C.F..
 3. Margin = Result – Limit.

**Conducted Emission Test Data (at Mains Terminal)**

Test Site : HA2
Model Number : BR900MI
Power phase : LINE
Test Voltage : 0V
Description : Battery mode

Test Date : 15-Jun-2022
Temperature : 25°C
Humidity : 60%RH
Test by : Andrew Lin



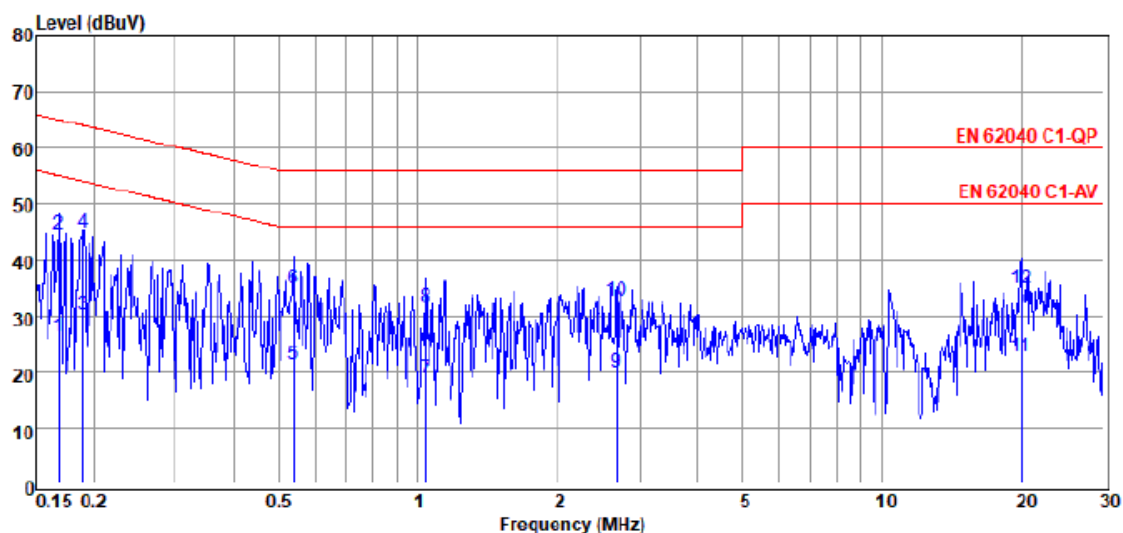
No.	Freq MHz	Reading dBuV	C.F dB	Result dBuV	Limit dBuV	Margin dB	Power Line	Remark
1	0.185	30.61	0.08	30.69	54.24	-23.55	LINE	Average
2	0.185	46.88	0.08	46.96	64.24	-17.28	LINE	QP
3	0.242	24.86	0.08	24.94	52.04	-27.10	LINE	Average
4	0.242	42.83	0.08	42.91	62.04	-19.13	LINE	QP
5	0.312	28.86	0.09	28.95	49.93	-20.98	LINE	Average
6	0.312	43.30	0.09	43.39	59.93	-16.54	LINE	QP
7	0.909	23.19	0.14	23.33	46.00	-22.67	LINE	Average
8	0.909	38.12	0.14	38.26	56.00	-17.74	LINE	QP
9	16.486	22.01	0.79	22.80	50.00	-27.20	LINE	Average
10	16.486	35.67	0.79	36.46	60.00	-23.54	LINE	QP
11	22.416	22.62	0.92	23.54	50.00	-26.46	LINE	Average
12	22.416	33.80	0.92	34.72	60.00	-25.28	LINE	QP

Remark : 1. All readings are Quasi-Peak and Average values.
2. Result = Reading + C.F..
3. Margin = Result – Limit.

**Conducted Emission Test Data (at Mains Terminal)**

Test Site : HA2
Model Number : BR900MI
Power phase : NEUTRAL
Test Voltage : 0V
Description : Battery mode

Test Date : 15-Jun-2022
Temperature : 25°C
Humidity : 60%RH
Test by : Andrew Lin



No.	Freq MHz	Reading dBuV	C.F dB	Result dBuV	Limit dBuV	Margin dB	Power Line	Remark
1	0.168	26.15	0.08	26.23	55.08	-28.85	NEUTRAL	Average
2	0.168	44.37	0.08	44.45	65.08	-20.63	NEUTRAL	QP
3	0.189	30.00	0.08	30.08	54.06	-23.98	NEUTRAL	Average
4	0.189	44.66	0.08	44.74	64.06	-19.32	NEUTRAL	QP
5	0.538	21.26	0.10	21.36	46.00	-24.64	NEUTRAL	Average
6	0.538	34.89	0.10	34.99	56.00	-21.01	NEUTRAL	QP
7	1.037	18.75	0.15	18.90	46.00	-27.10	NEUTRAL	Average
8	1.037	31.48	0.15	31.63	56.00	-24.37	NEUTRAL	QP
9	2.678	19.68	0.21	19.89	46.00	-26.11	NEUTRAL	Average
10	2.678	32.32	0.21	32.53	56.00	-23.47	NEUTRAL	QP
11	19.950	21.68	0.89	22.57	50.00	-27.43	NEUTRAL	Average
12	19.950	33.94	0.89	34.83	60.00	-25.17	NEUTRAL	QP

Remark : 1. All readings are Quasi-Peak and Average values.
2. Result = Reading + C.F..
3. Margin = Result – Limit.



3 Radiated Emission Test

3.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

3.2 Test Arrangement and Procedure

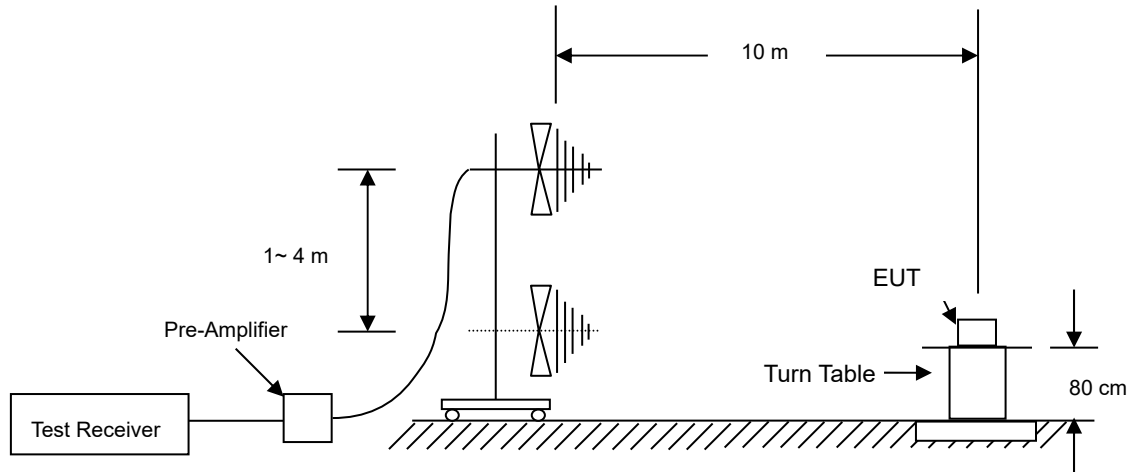


Table-top Equipment

- The EUT was placed 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 IEC 62040-2

Frequency Range (MHz)	Quasi-Peak dB(μ V/m)		
	<input checked="" type="checkbox"/> Category C1 UPS	<input type="checkbox"/> Category C2 UPS	<input type="checkbox"/> Category C3 UPS
30 to 230 ^a	30	40	50
230 to 1000	37	47	60
^a The lower limit shall apply at the transition frequency.			

3.4 Test Result

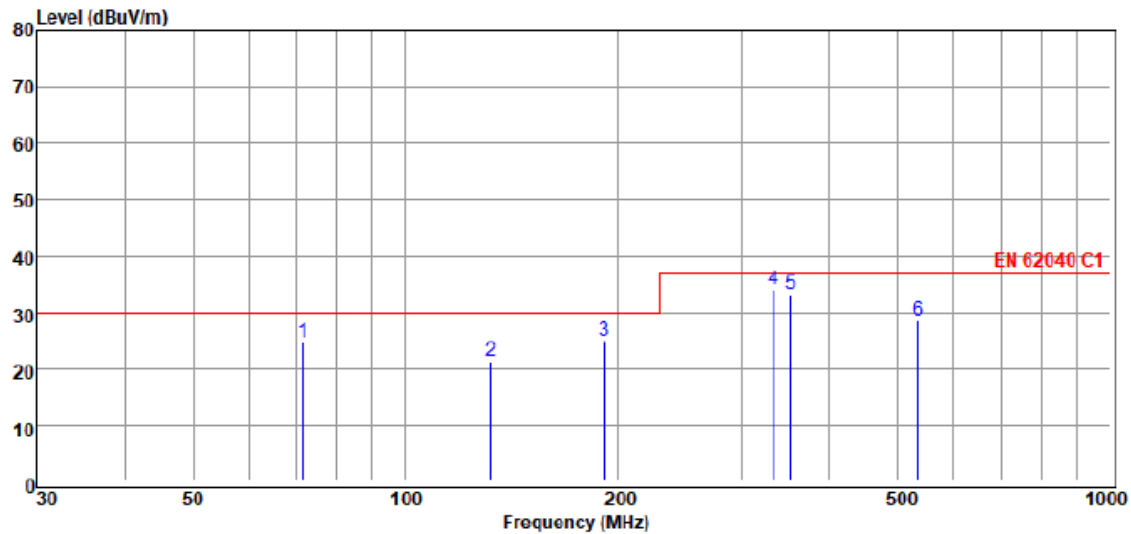
PASS

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

**Radiated Emission Test Data**

Test Site : HA2 10m
Model Number : BR900MI
Polarization : Horizontal
Test Voltage : 230V/50Hz
Description : LINE mode

Test Date : 15-Jun-2022
Temperature : 25°C
Humidity : 60%RH
Test by : Andrew Lin



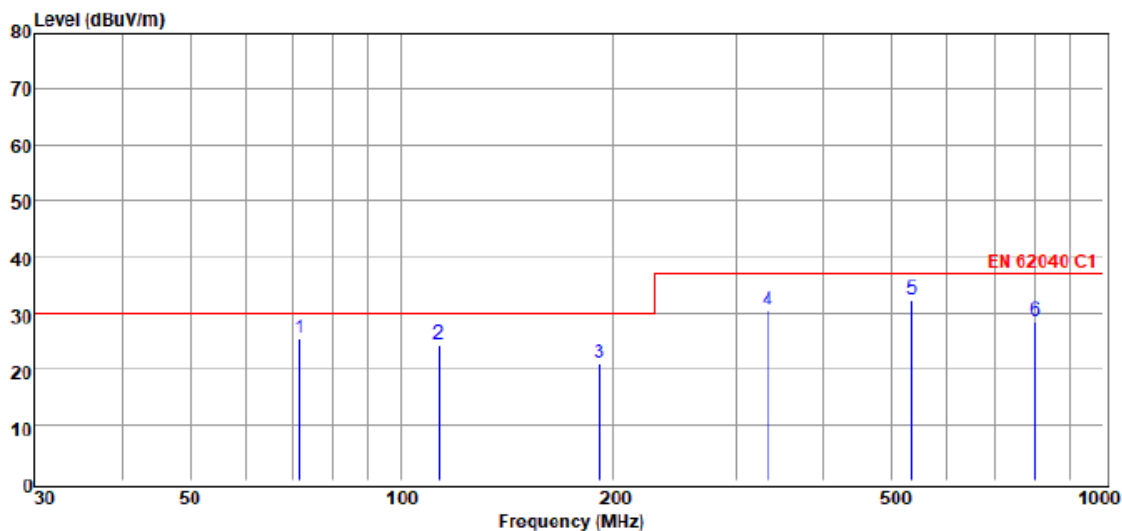
No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	71.450	41.62	-17.12	24.50	30.00	-5.50	382	65	HORIZONTAL	QP
2	132.190	33.46	-12.13	21.33	30.00	-8.67	388	100	HORIZONTAL	QP
3	191.840	39.56	-14.51	25.05	30.00	-4.95	385	105	HORIZONTAL	QP
4	333.740	43.21	-9.28	33.93	37.00	-3.07	395	120	HORIZONTAL	QP
5	351.620	41.86	-8.66	33.20	37.00	-3.80	391	110	HORIZONTAL	QP
6	533.740	33.16	-4.56	28.60	37.00	-8.40	390	115	HORIZONTAL	QP

Remark : 1. All readings are Quasi-Peak values.
2. Result = Reading + C.F..
3. Margin = Result – Limit.

**Radiated Emission Test Data**

Test Site : HA2 10m
Model Number : BR900MI
Polarization : Vertical
Test Voltage : 230V/50Hz
Description : LINE mode

Test Date : 15-Jun-2022
Temperature : 25°C
Humidity : 60%RH
Test by : Andrew Lin



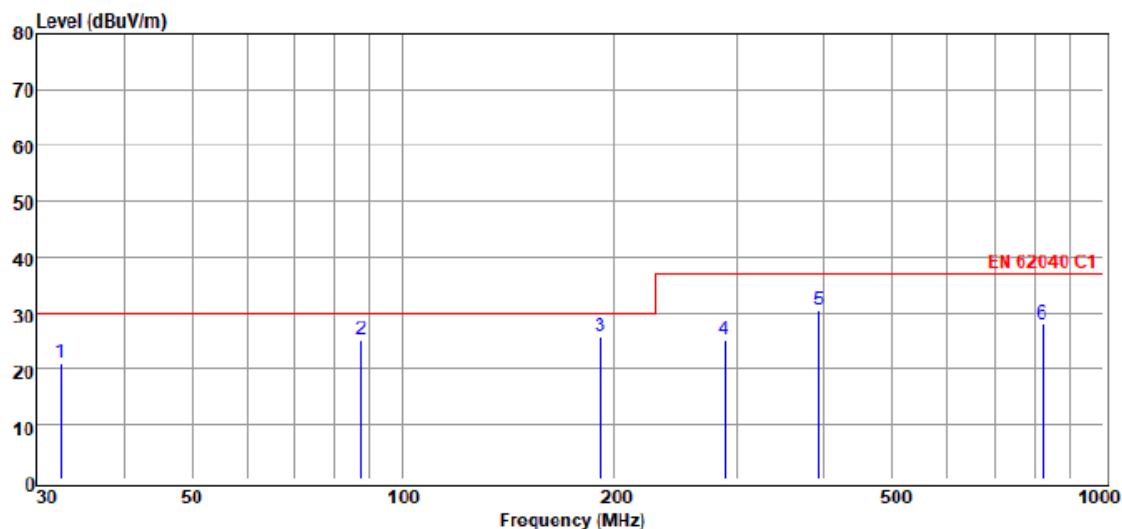
No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	71.520	42.48	-17.12	25.36	30.00	-4.64	114	105	VERTICAL	QP
2	113.250	36.61	-12.30	24.31	30.00	-5.69	120	85	VERTICAL	QP
3	191.840	35.59	-14.51	21.08	30.00	-8.92	118	110	VERTICAL	QP
4	333.750	39.62	-9.28	30.34	37.00	-6.66	200	90	VERTICAL	QP
5	533.250	36.84	-4.56	32.28	37.00	-4.72	205	120	VERTICAL	QP
6	801.640	27.74	0.68	28.42	37.00	-8.58	195	115	VERTICAL	QP

Remark : 1. All readings are Quasi-Peak values.
2. Result = Reading + C.F..
3. Margin = Result – Limit.

**Radiated Emission Test Data**

Test Site : HA2 10m
Model Number : BR900MI
Polarization : Horizontal
Test Voltage : 0V
Description : Battery mode

Test Date : 15-Jun-2022
Temperature : 25°C
Humidity : 60%RH
Test by : Andrew Lin



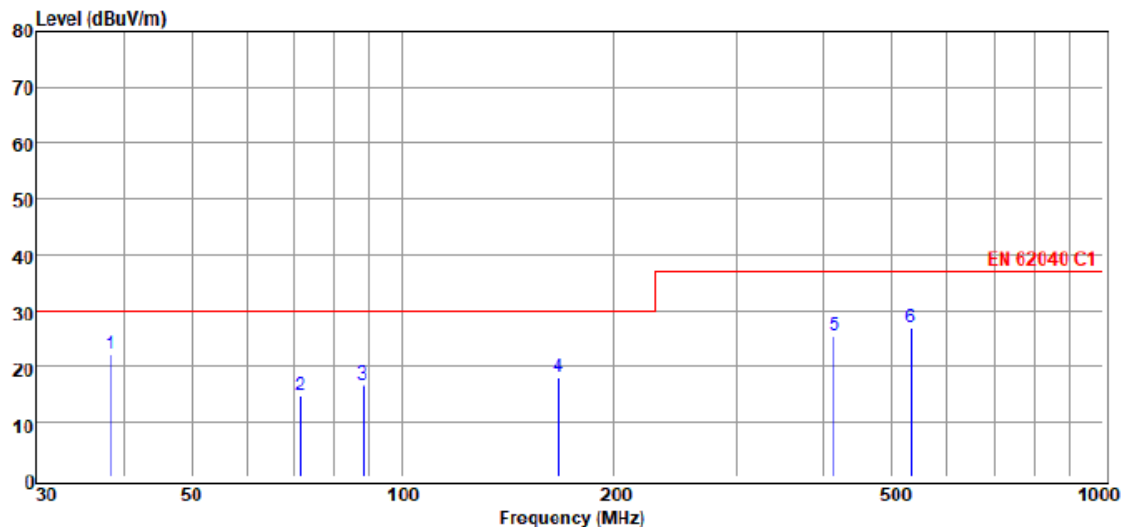
No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	32.520	27.47	-6.31	21.16	30.00	-8.84	382	100	HORIZONTAL	QP
2	87.240	40.16	-15.06	25.10	30.00	-4.90	388	120	HORIZONTAL	QP
3	191.850	40.23	-14.51	25.72	30.00	-4.28	389	105	HORIZONTAL	QP
4	287.750	35.13	-10.06	25.07	37.00	-11.93	395	95	HORIZONTAL	QP
5	393.250	37.66	-7.21	30.45	37.00	-6.55	391	110	HORIZONTAL	QP
6	818.750	27.25	0.77	28.02	37.00	-8.98	383	115	HORIZONTAL	QP

Remark : 1. All readings are Quasi-Peak values.
2. Result = Reading + C.F..
3. Margin = Result – Limit.

**Radiated Emission Test Data**

Test Site : HA2 10m
Model Number : BR900MI
Polarization : Vertical
Test Voltage : 0V
Description : Battery mode

Test Date : 15-Jun-2022
Temperature : 25°C
Humidity : 60%RH
Test by : Andrew Lin



No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	38.360	31.28	-9.12	22.16	30.00	-7.84	115	100	VERTICAL	QP
2	71.540	31.67	-17.12	14.55	30.00	-15.45	121	80	VERTICAL	QP
3	87.950	31.48	-14.86	16.62	30.00	-13.38	117	115	VERTICAL	QP
4	167.250	31.62	-13.67	17.95	30.00	-12.05	112	85	VERTICAL	QP
5	414.330	31.72	-6.33	25.39	37.00	-11.61	200	120	VERTICAL	QP
6	531.840	31.52	-4.57	26.95	37.00	-10.05	205	110	VERTICAL	QP

Remark : 1. All readings are Quasi-Peak values.
2. Result = Reading + C.F..
3. Margin = Result – Limit.

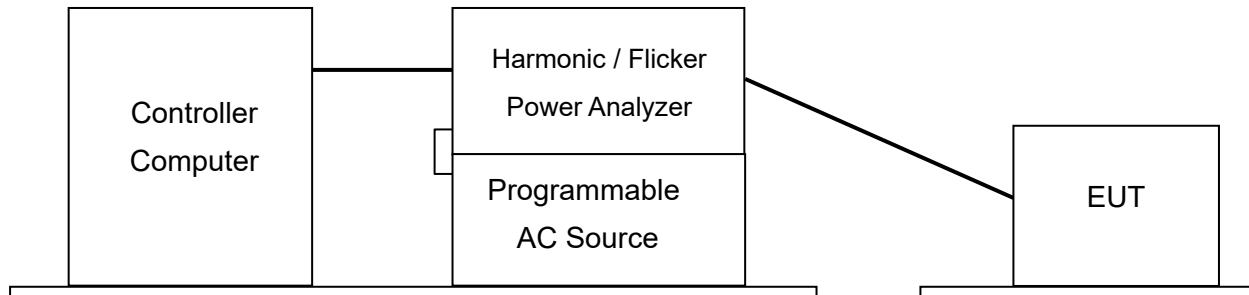


4 Harmonic Current Emission Measurement

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 EN IEC 61000-3-2 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

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	16-Jun-2022	25°C	60%RH	1005mbar

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
$15 \leq n \leq 39$	$0.15 * 15 / n$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 * 8 / n$

4.5 Test Result

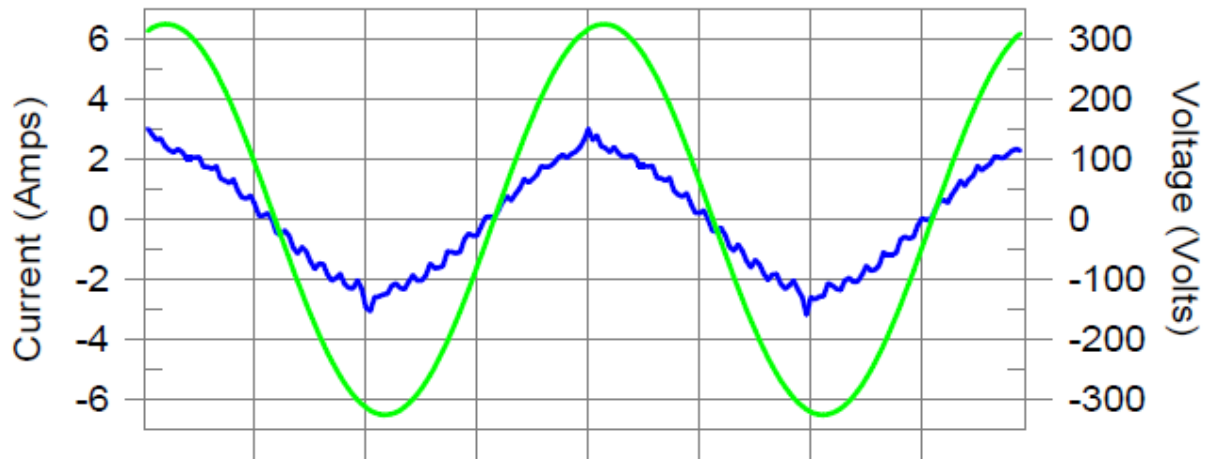
PASS

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



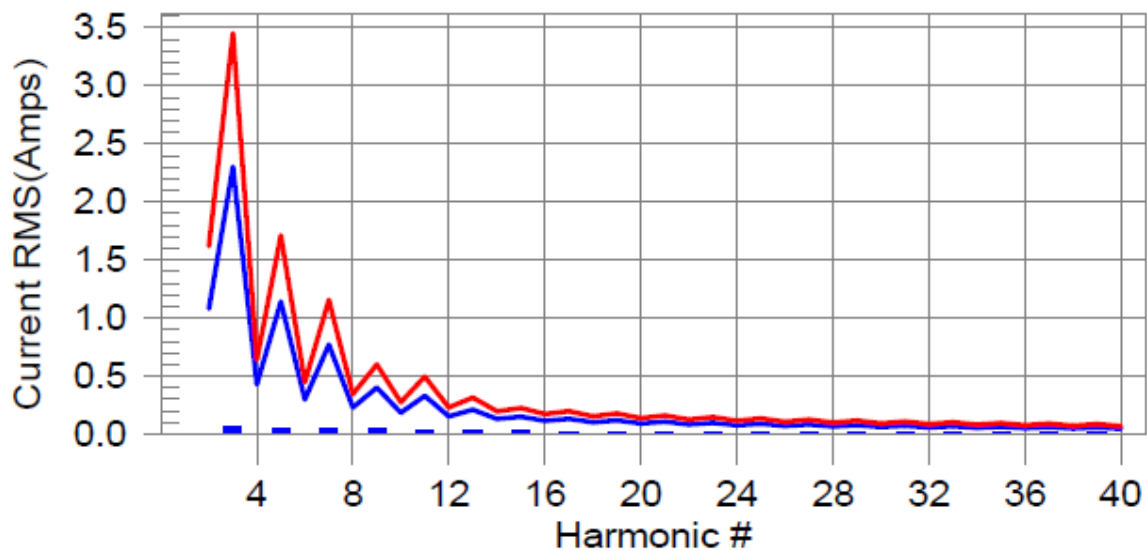
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H35-12.8% of 150% limit, H33-18.7% of 100% limit



Test Result: Pass Source qualification: Normal

THC(A): 0.124 I-THD(%): 7.2 POHC(A): 0.041 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.04

I_Peak (Amps): 3.277

I_Fund (Amps): 1.714

Power (Watts): 392.3

Frequency(Hz): 50.00

I_RMS (Amps): 1.723

Crest Factor: 1.904

Power Factor: 0.990

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.059	2.300	2.6	0.059	3.450	1.7	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.050	1.140	4.4	0.051	1.710	3.0	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.046	0.770	6.0	0.047	1.155	4.1	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.042	0.400	10.5	0.042	0.600	7.0	Pass
10	0.000	0.184	N/A	0.001	0.276	N/A	Pass
11	0.037	0.330	11.2	0.037	0.495	7.5	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.031	0.210	14.9	0.031	0.315	10.0	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.026	0.150	17.5	0.026	0.225	11.7	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.021	0.132	16.3	0.022	0.198	10.9	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.018	0.118	15.0	0.018	0.178	10.1	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.015	0.107	14.2	0.015	0.161	9.6	Pass
22	0.001	0.084	N/A	0.001	0.125	N/A	Pass
23	0.014	0.098	14.2	0.014	0.147	9.6	Pass
24	0.001	0.077	N/A	0.001	0.115	N/A	Pass
25	0.014	0.090	15.1	0.014	0.135	10.2	Pass
26	0.001	0.071	N/A	0.001	0.107	N/A	Pass
27	0.014	0.083	16.3	0.014	0.125	11.1	Pass
28	0.001	0.066	N/A	0.001	0.099	N/A	Pass
29	0.014	0.078	17.5	0.014	0.116	11.9	Pass
30	0.001	0.061	N/A	0.001	0.092	N/A	Pass
31	0.013	0.073	18.3	0.014	0.109	12.5	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.013	0.068	18.7	0.013	0.102	12.8	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.012	0.064	18.7	0.012	0.096	12.8	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.011	0.061	18.4	0.012	0.091	12.7	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.010	0.058	N/A	0.011	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

※Harmonic currents less than 0,6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

5 Electrostatic Discharge Immunity Test

5.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

5.2 Test Configuration and Procedure

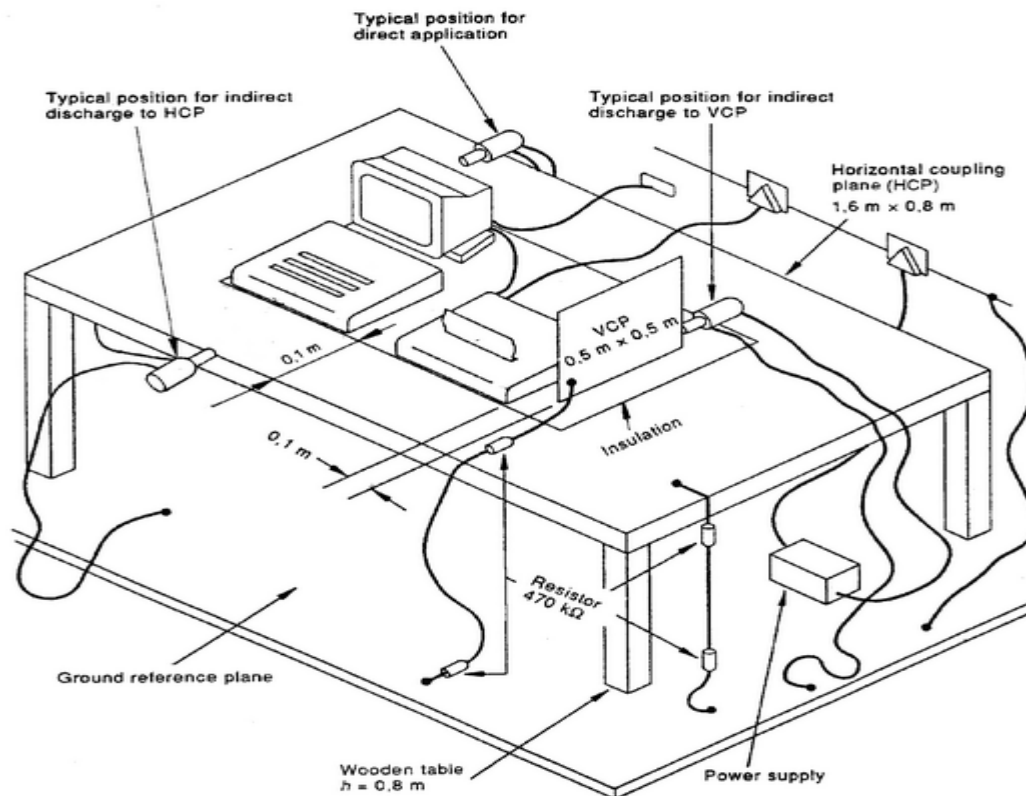


Table-top Equipment

- 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 were 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 was exposed to minimum of 10 single discharges on the selected test points.
- The result was observed and analyzed.



5.3 Test Result

5.3.1 Environment Condition

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	16-Jun-2022	25°C	60%RH	1005mbar

5.3.2 Observation of Direct Discharge

Test Points: 1. Surface of Case. 2. Junction of Case. 3. Button. 4. RJ45.RJ11.

Type of Discharge	Test Specifications				Performance Required by EN IEC 62040-2	Observed Result	Verdict
	Test Level	Polarity	Test Point	Number of Discharge			
Air Discharge	2,4,8 (kV)	±	1~3	10/ per point	B	A	Pass ¹
Contact Discharge	4 (kV)	±	3	10/ per point	B	A	Pass ²
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.						
Note	The selected points were marked with red labels on the EUT.						

The Performance Requirement Class Criterion is defined in Sec. 1.11.

5.3.3 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 EN IEC 62040-2	Observed Result	Verdict
	Test Level	Polarity	Test Point	Number of Discharge			
HCP Application	4 (kV)	±	1~4	10/ per point	B	A	Pass ¹
VCP Application	4 (kV)	±	1~4	10/ per point	B	A	Pass ²
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.						

The Performance Requirement Class Criterion is defined in Sec. 1.11.

PASS

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



6 Radio-frequency, Electromagnetic Field Immunity Test

6.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

6.2 Test Configuration and Procedure

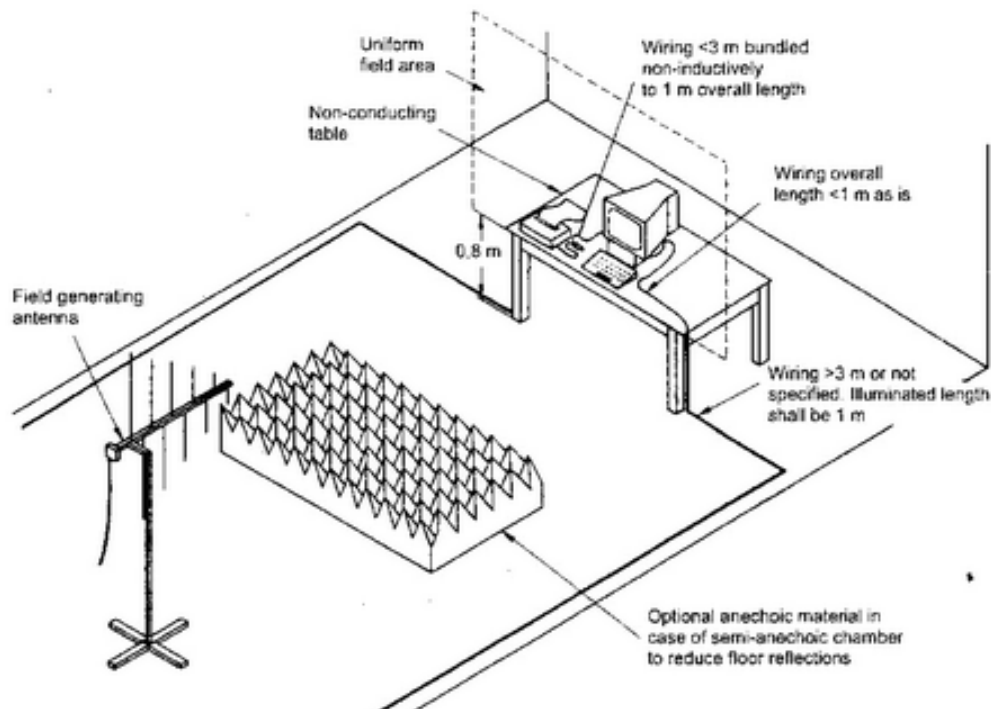


Table-top Equipment

- 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.



6.3 Test Result

6.3.1 Environment Condition

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	16-Jun-2022	25°C	60%RH	1005mbar

6.3.2 Observation of Test

Type of Modulation	Test Specifications				Performance Required by EN IEC 62040-2	Observed Result	Verdict
	Field Strength	Frequency Range	Modulated	Polarity			
Amplitude Modulation	3 V/m	80 to 1000MHz	1kHz, 80% AM, Sine wave	V&H	A	A	Pass ¹
Remark	1. No temporary degradation or loss of function has been observed throughout the entire test.						
Note	The applied 0°, 90°, 180°, 270° relative to the position to the equipment under test.						

The Performance Requirement Class Criterion is defined in Sec. 1.11.

PASS

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



7 Electrical Fast Transient Test

7.1 Test Instrument

Refer to Sec. 1.2 Test Instruments.

7.2 Test Configuration and Procedure

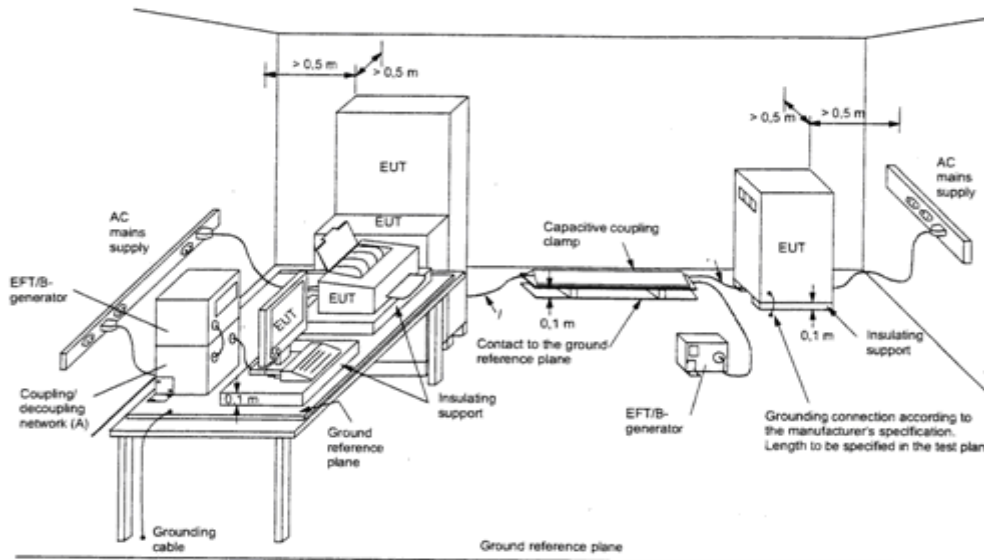


Table-top Equipment

- 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 lines 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 level.
- Operating condition was shown on the monitor and observed.



7.3 Test Result

7.3.1 Environment Condition

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	16-Jun-2022	25°C	60%RH	1005mbar

7.3.2 Observation of Power Supply Port

Coupling Selection	Test Specifications				Performance Required by EN IEC 62040-2	Observed Result	Verdict
	Voltage (kV)	Test Duration (Sec)	Repetition Frequency (kHz)	Tr/ Th (nS)			
L	±1	60	5	5/50	B	A	Pass ¹
N	±1	60	5	5/50	B	A	Pass ¹
PE	±1	60	5	5/50	B	A	Pass ¹
L + N	±1	60	5	5/50	B	A	Pass ¹
L + PE	±1	60	5	5/50	B	A	Pass ¹
N + PE	±1	60	5	5/50	B	A	Pass ¹
L + N +PE	±1	60	5	5/50	B	A	Pass ¹
Remark	1. No temporary degradation or loss of function has been observed throughout the entire test.						

The Performance Requirement Class Criterion is defined in Sec. 1.11.

PASS

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



8 Surge Immunity Test

8.1 Test Instrument

Refer to Sec. 1.2 Test Instruments.

8.2 Test Configuration and Procedure

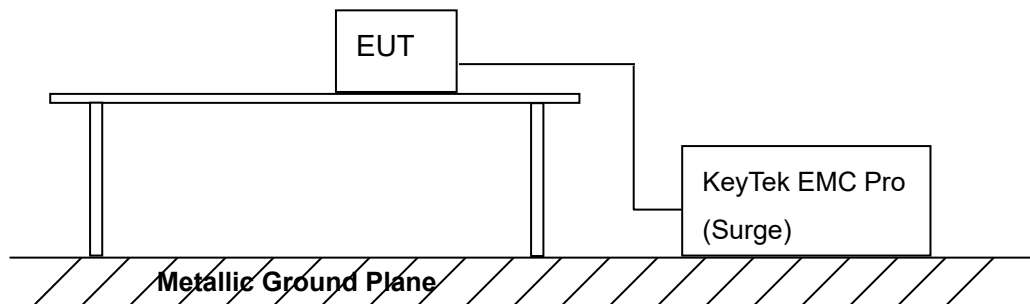


Table-top Equipment

- 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 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.



8.3 Test Result

8.3.1 Environment Condition

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	16-Jun-2022	25°C	60%RH	1005mbar

8.3.2 Observation of Power Supply Port

Coupling Selection	Test Specifications			Performance Required by EN IEC 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 ¹
L ► PE	±0.5, 1,2	5	1	B	A	Pass ¹
N ► PE	±0.5, 1,2	5	1	B	A	Pass ¹
Remark	1. No temporary degradation or loss of function has been observed throughout the entire test.					

The Performance Requirement Class Criterion is defined in Sec. 1.11.

8.3.3 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 IEC 62040-2.

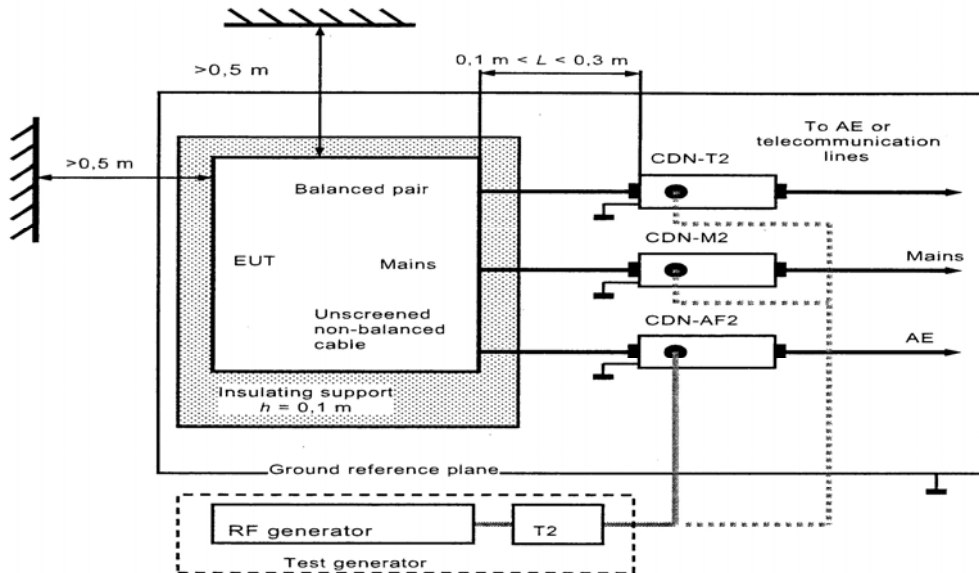


9 Radio-frequency, Conducted Disturbances Immunity Test

9.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

9.2 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 50Ω 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.



9.3 Test Result

9.3.1 Environment Condition

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	16-Jun-2022	25°C	60%RH	1005mbar

9.3.2 Observation of Test

Type of Modulation	Test Specifications			Performance Required by EN IEC 62040-2	Observed Result	Verdict
	Voltage Level	Frequency Range	Modulation			
Amplitude Modulation	3V / 130dB μ V	0.15 to 80MHz	80%, 1kHz, sinusoidal	A	A	Pass ¹
Remark	1. No temporary degradation or loss of function has been observed throughout the entire test.					

The Performance Requirement Class Criterion is defined in Sec. 1.11.

PASS

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



10 Power Frequency Magnetic Field Immunity Test

10.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

10.2 Test Configuration and Procedure

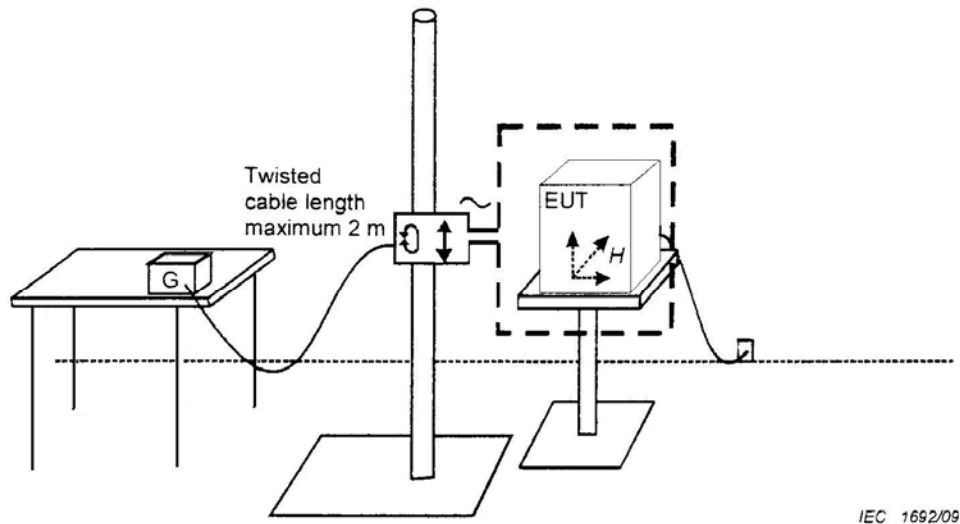


Table-top Equipment

- 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.



10.3 Test Result

10.3.1 Environment Condition

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	16-Jun-2022	25°C	60%RH	1005mbar

10.3.2 Observation of Test

Level (A/m)	Frequency (Hz)	Performance Required by EN IEC 62040-2	Observed Result	Verdict
3	50	B	A	Pass ¹
Remark:	1. No temporary degradation or loss of function has been observed throughout the entire test.			

The Performance Requirement Class Criterion is defined in Sec. 1.11.

PASS

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

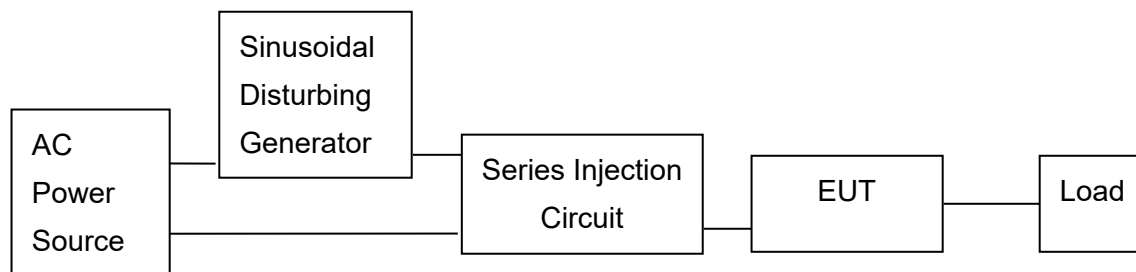


11 Low Frequency Signals Immunity Test

11.1 Test Instrument

Refer to Sec. 1.2 Test Instruments.

11.2 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 UPS (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

11.3 Test Result

11.3.1 Environment Condition

Test Site	Test Date	Temperature	Humidity	Atmospheric Pressure
HA3	15-Jun-2022	25°C	60%RH	1005mbar

11.3.2 Observation

Frequency Range (Hz)	Strength	Required by EN IEC 62040-2	Observed Result	Verdict
140 to 360	10V (rms) Sinusoidal	A	A	Pass ¹
Remark:	1. No temporary degradation or loss of function has been observed throughout the entire test.			

The Performance Requirement Class Criterion is defined in Sec. 1.11.

PASS

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



12 Photographs of Test

12.1 Power Line Conducted Test



Front View



Rear View



12.2 Radiated Emission Test



Front View



Rear View



12.3 Harmonic Current Measurement

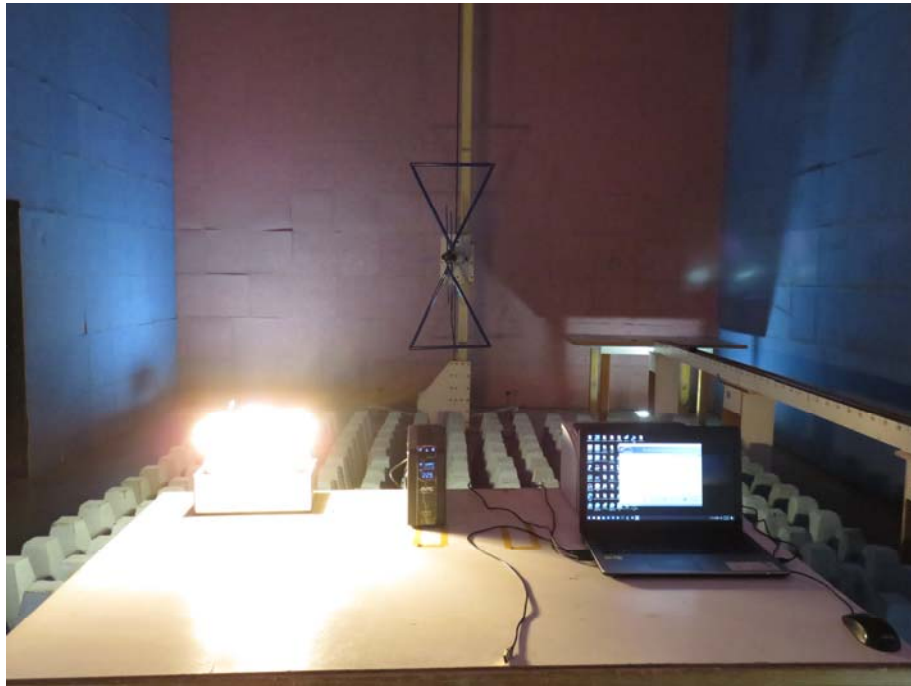


12.4 Electrostatic Discharge Immunity Test

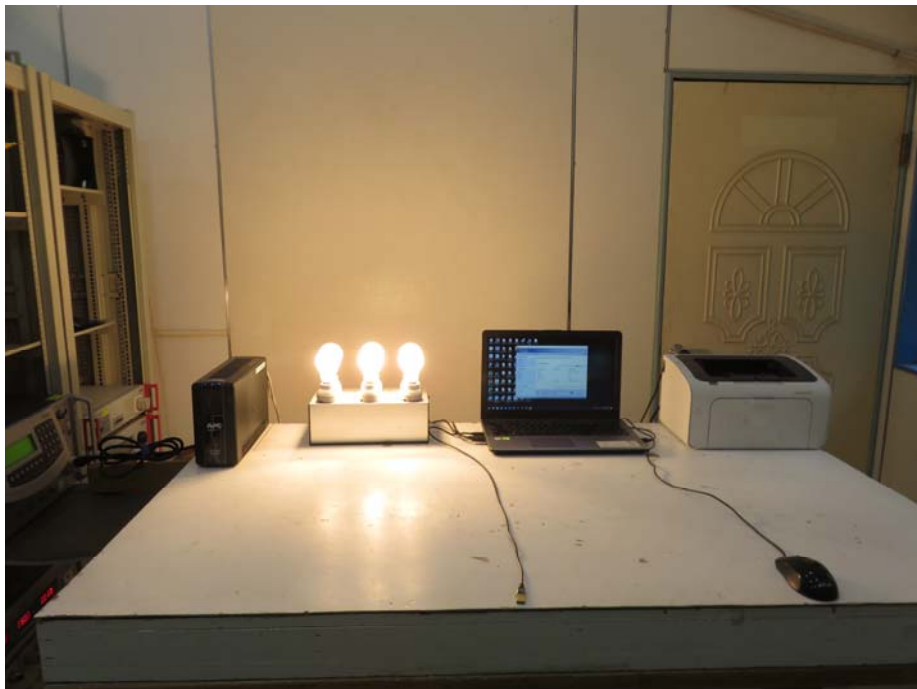




12.5 Radio-frequency, Electromagnetic Field Immunity Test

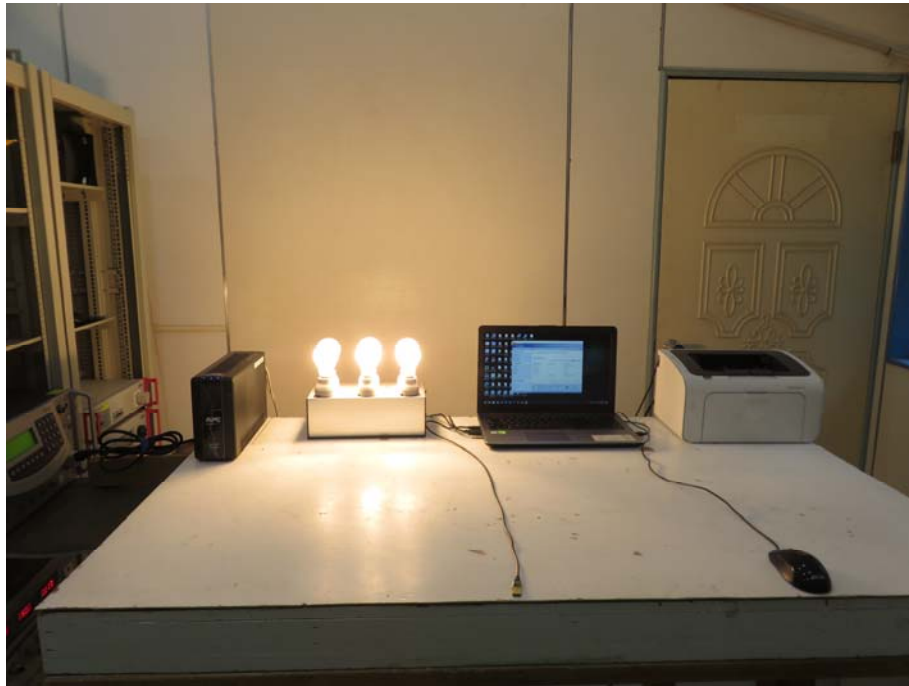


12.6 Electrical Fast Transient / Burst Immunity Test

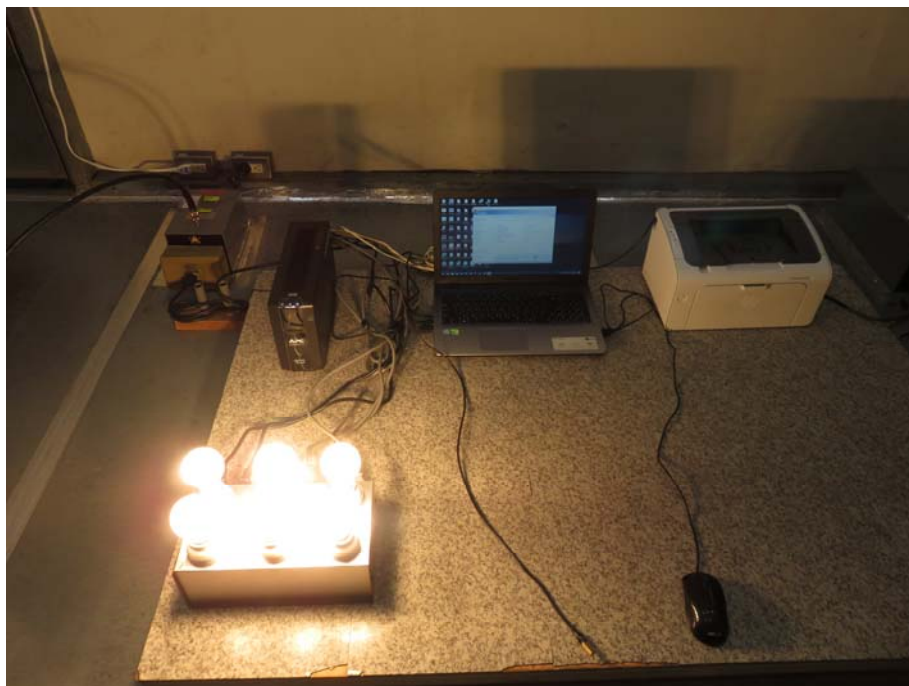




12.7 Surge Immunity Test

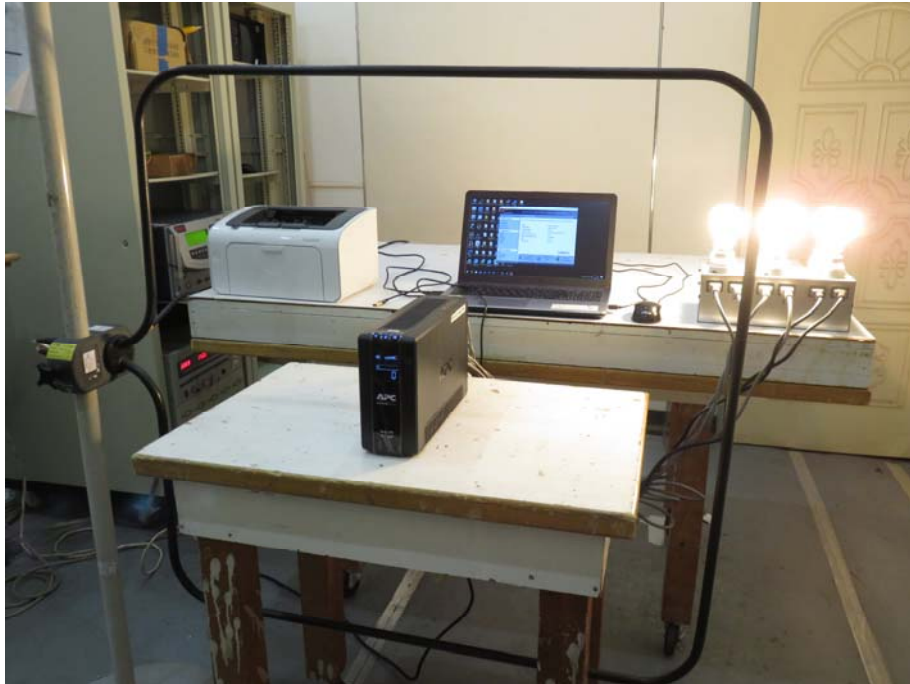


12.8 Radio-frequency, Conducted Disturbances Immunity Test





12.9 Power Frequency Magnetic Field Immunity Test





13 Photographs of EUT



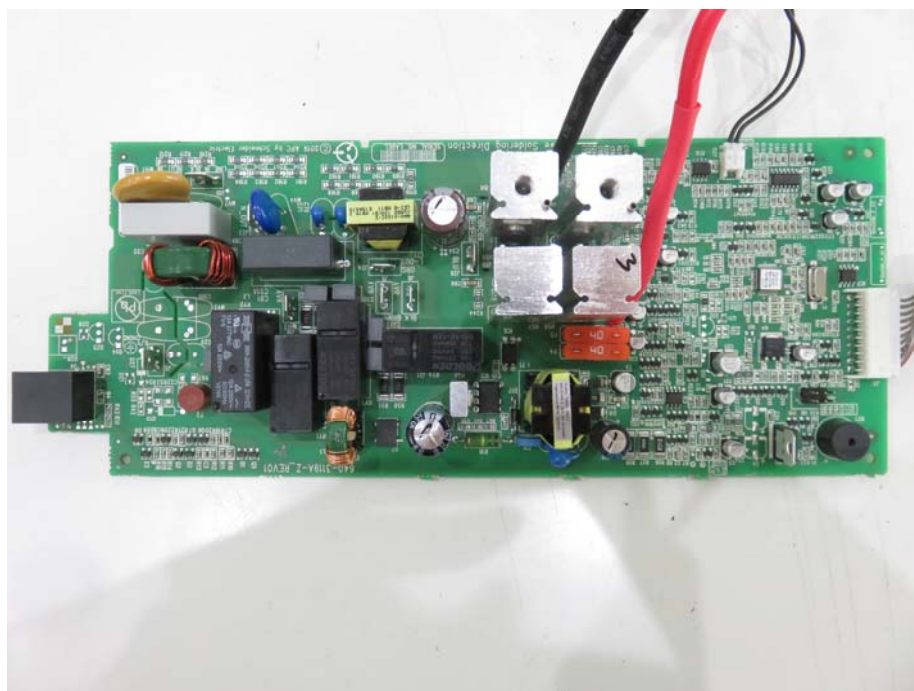
Front View of the EUT



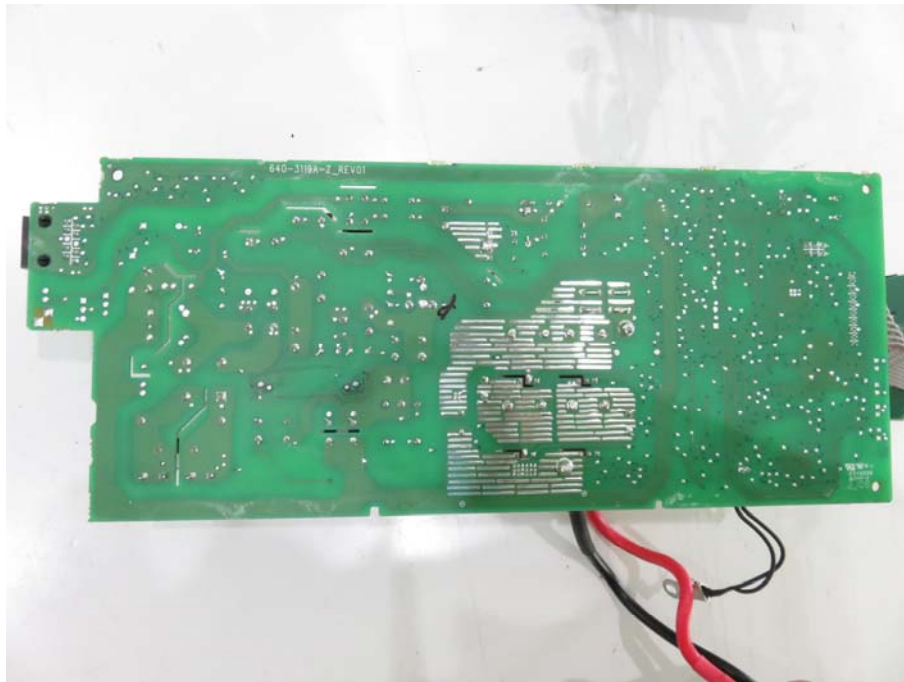
Rear View of the EUT



Inside View of the EUT



Front View of the PCB 1



Rear View of the PCB 1



Front View of the PCB 2



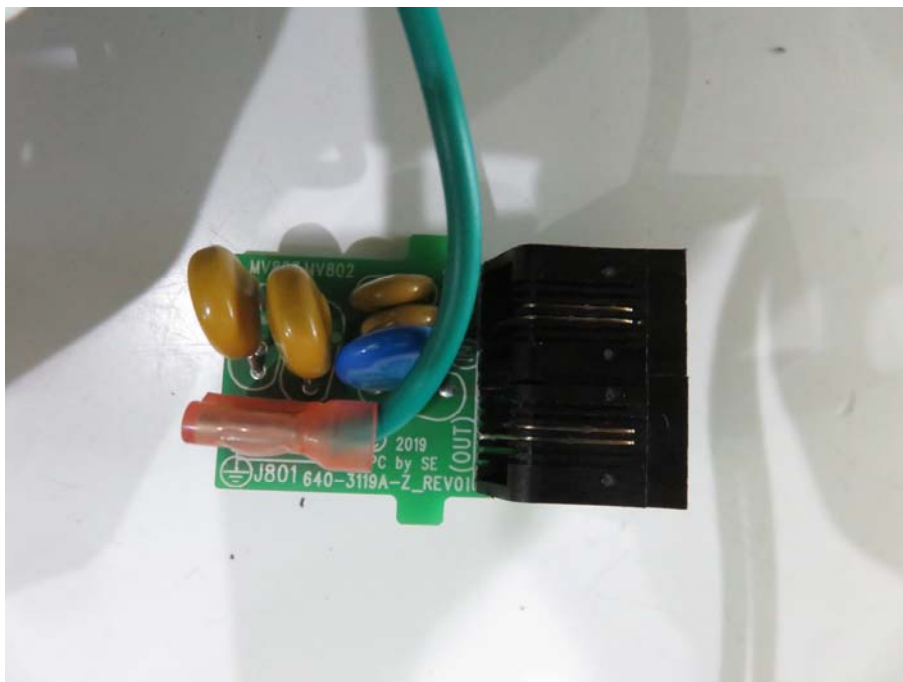
Rear View of the PCB 2



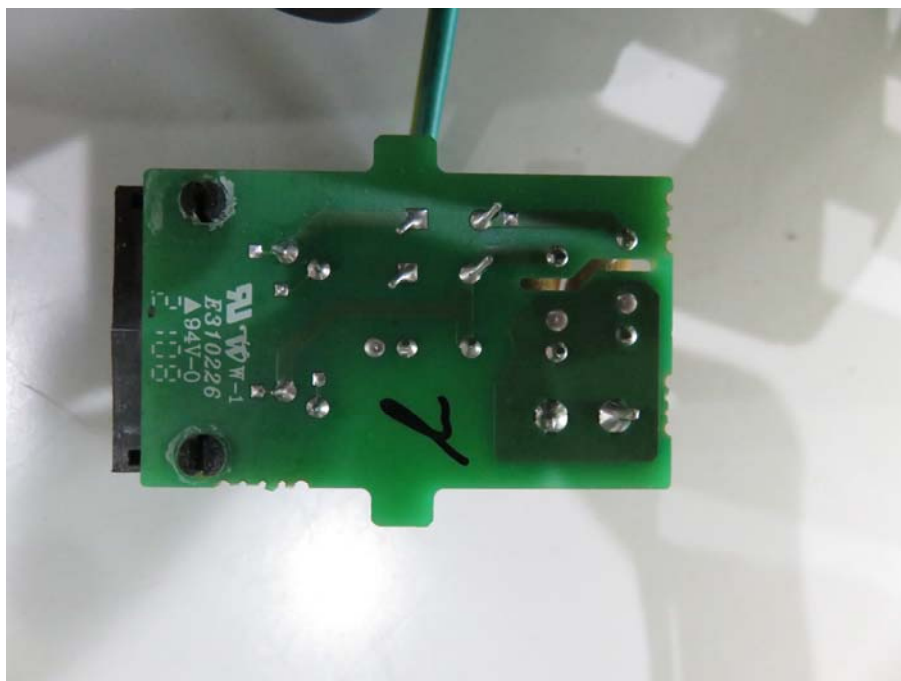
Front View of the PCB 3



Rear View of the PCB 3



Front View of the PCB 4



Rear View of the PCB 4



View of the voltage changer



View of the Power output line



View of the EUT Battery



View of the I/O port



14 Photographs of ESD Test Points



View of ESD Test Points