



中国认可  
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检测  
TESTING  
CNAS L2291



# TEST REPORT

**Product Name** : Uninterruptible Power Systems(UPS)  
**Model Number** : NTCS3INT101-RTY, NTCS3EXT101-RTY

**Prepared for** : Netcon Enterprise Pvt Ltd  
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**Report Number** : ENS2503110254E00701R  
**Date(s) of Tests** : August 17, 2022 to November 25, 2022  
**Date of issue** : March 18, 2025



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APPENDIX A (Photos of the EUT) (3 pages)

|              |   |                                                                                   |
|--------------|---|-----------------------------------------------------------------------------------|
| Applicant    | : | Netcon Enterprise Pvt Ltd                                                         |
| Manufacturer | : | Netcon Enterprise Pvt Ltd                                                         |
| Trademark    | : |  |
| EUT          | : | Uninterruptible Power Systems(UPS)                                                |
| Model Number | : | NTCS3INT101-RTY, NTCS3EXT101-RTY                                                  |
| Battery Bank | : | NTBR4024C, NTBR6036C                                                              |
| Rating       | : | Input: 220-240VAC, 50/60Hz<br>Output: 220-240VAC<br>Buttery: DC 24V               |

## Modified Information

| Version | Report No.           | Revision Date | Summary         |
|---------|----------------------|---------------|-----------------|
| Ver.1.0 | ENS2503110254E00701R | /             | Original Report |



## 1. DESCRIPTION OF STANDARDS AND RESULTS (EUT)

| EMISSION                                          |                              |                                     |                      |         |
|---------------------------------------------------|------------------------------|-------------------------------------|----------------------|---------|
| Description of Test Item                          |                              | Standard                            | Limits               | Results |
| conducted emissions                               | at the AC input port (mains) | EN IEC 62040-2: 2018                | C2                   | Pass    |
|                                                   | at the AC output port        | EN IEC 62040-2: 2018                | C2                   | N/A     |
|                                                   | at the network ports         | EN IEC 62040-2: 2018                | C2                   | N/A     |
| Radiated emissions at frequencies up to 1 GHz     |                              | EN IEC 62040-2: 2018                | C2                   | Pass    |
| Harmonic Current Emissions                        |                              | EN IEC 61000-3-2:2019+A1:2021       | Class A              | Pass    |
| Voltage Fluctuation and Flicker                   |                              | EN 61000-3-3:2013+A2:2021           | Section 5            | Pass    |
| IMMUNITY                                          |                              |                                     |                      |         |
| Description of Test Item                          |                              | Basic Standard                      | Performance Criteria | Results |
| Electrostatic Discharge (ESD)                     |                              | IEC 61000-4-2:2008                  | B                    | Pass    |
| RF Field Strength Susceptibility (R/S)            |                              | IEC 61000-4-3: 2006+A1:2007+A2:2010 | A                    | Pass    |
| Electro Fast Transient (EFT)                      |                              | IEC 61000-4-4:2012                  | B                    | Pass    |
| Surge (Input AC Power Port)                       |                              | IEC 61000-4-5:2014                  | B                    | Pass    |
| Radio-Frequency, Continuous Conducted Disturbance |                              | IEC 61000-4-6:2013                  | A                    | Pass    |
| Power Frequency Magnetic Field                    |                              | IEC 61000-4-8:2009                  | A                    | Pass    |
| Low Frequency signals                             |                              | IEC 61000-2-2:2002                  | A                    | Pass    |
| Voltage Dips and Interruptions                    |                              | IEC 61000-4-11:2004                 | -                    | Pass    |
| Note: N/A is an abbreviation for Not Applicable.  |                              |                                     |                      |         |

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

|                  |                                                                                                                                                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT              | : Uninterruptible Power Systems(UPS)                                                                                                                                                                                                                            |
| Model Number     | : NTCS3INT101-RTY, NTCS3EXT101-RTY<br>(Note: These models are identical in circuitry and electrical, mechanical and physical construction; the only differences are the trade name and model number. for trading purpose. We prepare NTCS3INT101-RTY for test.) |
| Battery Bank     | : NTBR4024C, NTBR6036C                                                                                                                                                                                                                                          |
| Sample number    | : 1#                                                                                                                                                                                                                                                            |
| Test Voltage     | : AC 230V/50Hz, DC 24V                                                                                                                                                                                                                                          |
| Applicant        | : Netcon Enterprise Pvt Ltd                                                                                                                                                                                                                                     |
| Address          | : 430A, Kathirvedu, Puzhal, Chennai- 600066, India                                                                                                                                                                                                              |
| Manufacturer     | : Netcon Enterprise Pvt Ltd                                                                                                                                                                                                                                     |
| Address          | : 430A, Kathirvedu, Puzhal, Chennai- 600066, India                                                                                                                                                                                                              |
| Date of Received | : August 17, 2022                                                                                                                                                                                                                                               |
| Date of Test     | : August 17, 2022 to November 25, 2022                                                                                                                                                                                                                          |

Note: This report change applicant, Manufacturer, trademark, Battery Bank and model number is based on ENS2411110239E00101R, this change does not affect the test results, and its original data and records refer to ENS2411110239E00101R.

### 2.2. Independent Operation Modes

- A. On
  - 1. Line mode
  - 2. Battery mode

### 2.3. Test Manner

| Test Items                                    | Test Voltage           | Operation Modes | Worst case |
|-----------------------------------------------|------------------------|-----------------|------------|
| Conducted disturbance at mains Terminals      | AC 230V/50Hz<br>DC 24V | Mode A          | Mode A.2   |
| Radiated emissions at frequencies up to 1 GHz | AC 230V/50Hz<br>DC 24V | Mode A          | Mode A.2   |
| Harmonic Current Emissions                    | AC 230V/50Hz           | Mode A.1        | Mode A.1   |
| Voltage Fluctuation and Flicker               | AC 230V/50Hz           | Mode A.1        | Mode A.1   |
| EMS                                           | AC 230V/50Hz<br>DC 24V | Mode A          | Mode A     |

### 2.4. Description of Support Device

N/A

### 2.5. Description of Test Facility

Site Description  
EMC Lab.

**Accredited by CNAS**

The Certificate Registration Number is L2291.

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

**Accredited by FCC**

Designation Number: CN1204

Test Firm Registration Number: 882943

**Accredited by A2LA**

The Certificate Number is 4321.01.

**Accredited by Industry Canada**

The Conformity Assessment Body Identifier is CN0008

Name of Firm

: EMTEK (SHENZHEN) CO., LTD.

Site Location

: Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

## 2.6. Measurement Uncertainty

| Test Item                                             | Uncertainty                                                             |
|-------------------------------------------------------|-------------------------------------------------------------------------|
| Conducted Emission Uncertainty                        | : 2.08dB (9k~150kHz Conduction 1#)<br>2.40dB (150k~30MHz Conduction 1#) |
| Radiated Emission Uncertainty<br>(3m 1# Chamber)      | : 4.46dB (30M~1GHz Polarize: H)<br>5.04dB (30M~1GHz Polarize: V)        |
| Uncertainty for Flicker test                          | : 0.07%                                                                 |
| Uncertainty for Harmonic test                         | : 1.8%                                                                  |
| Uncertainty for C/S Test                              | : 1.45(Using CDN Test)<br>2.37(Using EM Clamp Test)                     |
| Uncertainty for R/S Test                              | : 2.10dB(80MHz-200MHz)<br>1.76dB(200MHz-1000MHz)                        |
| Uncertainty for test site temperature<br>and humidity | : 0.6℃<br>4%                                                            |

### 3. MEASURING DEVICE AND TEST EQUIPMENT

#### 3.1. For Conducted Emissions At the Mains Power Ports

| Used                                | Equipment         | Manufacturer    | Model No. | Serial No. | Last Cal.    | Cal. Interval |
|-------------------------------------|-------------------|-----------------|-----------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | EMI Test Receiver | Rohde & Schwarz | ESCI      | 101384     | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | AMN               | Rohde & Schwarz | ENV216    | 101161     | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | AMN               | Kyoritsu        | KNW-407   | 8-1492-9   | May 14, 2022 | 1 Year        |

#### 3.2. For Radiated Emission Measurement (3M)

| Used                                | Equipment         | Manufacturer    | Model No. | Serial No. | Last Cal.     | Cal. Interval |
|-------------------------------------|-------------------|-----------------|-----------|------------|---------------|---------------|
| <input checked="" type="checkbox"/> | Pre-Amplifier     | HP              | 8447F     | 2944A07999 | May 14, 2022  | 1 Year        |
| <input checked="" type="checkbox"/> | EMI Test Receiver | Rohde & Schwarz | ESCI      | 101414     | May 14, 2022  | 1 Year        |
| <input checked="" type="checkbox"/> | Bilog Antenna     | Schwarzbeck     | VULB9163  | 712        | July 05, 2021 | 2 Year        |

#### 3.3. For Harmonics and Flick

| Used                                | Equipment                      | Manufacturer | Model No.         | Serial No. | Last Cal.    | Cal. Interval |
|-------------------------------------|--------------------------------|--------------|-------------------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | 45KVA AC Power source          | Teseq        | NSG 1007-45/45KVA | 1305A02873 | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Signal conditioning Unit       | Teseq        | CCN 1000-3        | 1305A02873 | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Impedance network              | Teseq        | INA2197/37A       | 1305A02873 | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Impedance network              | Teseq        | INA 2196/75A      | 1305A02874 | May 15, 2022 | 1 Year        |
| <input type="checkbox"/>            | Proflin 2100 AC Switching Unit | Teseq        | NSG 2200-3        | A22714     | May 15, 2022 | 1 Year        |

#### 3.4. Electrostatic Discharge Immunity Test

| Used                                | Equipment  | Manufacturer | Model No. | Serial No. | Last Cal.     | Cal. Interval |
|-------------------------------------|------------|--------------|-----------|------------|---------------|---------------|
| <input checked="" type="checkbox"/> | ESD Tester | TESEQ AG     | NSG 438A  | 130        | June 23, 2022 | 1 Year        |

### 3.5. For RF Strength Susceptibility Test

| Used                                | Equipment                          | Manufacturer       | Model No.        | Serial No.        | Last Cal.    | Cal. Interval |
|-------------------------------------|------------------------------------|--------------------|------------------|-------------------|--------------|---------------|
| <input checked="" type="checkbox"/> | Power Amplifier                    | MILMEGA            | AS0102-55        | 1018770           | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | RF Power Meter.<br>Dual Channel    | BOONTON            | 4232A            | 10539             | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Log.-Per. Antenna                  | SCHWARZBECK        | VULP 9118E       | 811               | N/A          | N/A           |
| <input checked="" type="checkbox"/> | Signal Generator                   | Agilent            | N5181A           | MY50145187        | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | 50ohm Diode Power<br>Sensor        | BOONTON            | 51011EMC         | 36164             | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Broad-Band Horn<br>Antenna         | SCHWARZBECK        | STLP 9149        | 9149-227          | N/A          | N/A           |
| <input checked="" type="checkbox"/> | Field Strength Meter               | DARE               | RSS1006A         | 10I00037SNO<br>22 | May 23, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Multi-function<br>interface system | DARE               | CTR1009B         | 12I00250SNO<br>72 | N/A          | N/A           |
| <input checked="" type="checkbox"/> | Automatic switch<br>group          | DARE               | RSW1004A         | N/A               | N/A          | N/A           |
| <input checked="" type="checkbox"/> | Power Amplifier                    | MILMEGA            | AS1860-50        | 1059346           | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Power Amplifier                    | MILMEGA            | 80RF1000-17<br>5 | 1059345           | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Directional Coupler                | MILMEGA            | DC6180AM1        | 0340463           | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Audio Analyzer                     | R&S                | UPV              | 101473            | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Audio Test System                  | AUDIO<br>PRECISION | ATS-1            | 41100             | May 14, 2022 | 1 Year        |

### 3.6. For Electrical Fast Transient / Burst Immunity Test

| Used                                | Equipment      | Manufacturer | Model No. | Serial No. | Last Cal.    | Cal. Interval |
|-------------------------------------|----------------|--------------|-----------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | Burst Tester   | HAEFELY      | PEFT4010  | 080981-16  | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Coupling Clamp | HAEFELY      | IP-4A     | 147147     | May 15, 2022 | 1 Year        |

### 3.7. For Surge Immunity Test

| Used                                | Equipment           | Manufacturer | Model No.   | Serial No. | Last Cal.    | Cal. Interval |
|-------------------------------------|---------------------|--------------|-------------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | Controller          | HAEFELY      | Psurge 8000 | 174031     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Impulse Module      | HAEFELY      | PIM 100     | 174124     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Coupling Decoupling | HAEFELY      | PCD 130     | 172181     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Coupling Module     | HAEFELY      | PCD122      | 174354     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Impulse Module      | HAEFELY      | PIM 120     | 174435     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Coupling Module     | HAEFELY      | PCD 126A    | 174387     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Impulse Module      | HAEFELY      | PIM 110     | 174391     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Impulse Module      | HAEFELY      | PIM 150     | 178707     | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Impulse Module      | PMI          | PCDN8       | 190422     | May 15, 2022 | 1 Year        |

### 3.8. For Injected Current Susceptibility Test

| Used                                | Equipment                 | Manufacturer | Model No.       | Serial No.   | Last Cal.    | Cal. Interval |
|-------------------------------------|---------------------------|--------------|-----------------|--------------|--------------|---------------|
| <input checked="" type="checkbox"/> | Continuous Wave Simulator | EMTEST       | CWS500C         | 0900-12      | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | CDN                       | EMTEST       | CDN-M2          | 510010010010 | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | CDN                       | EMTEST       | CDN-M3          | 0900-11      | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | EM Injection Clamp        | EMTEST       | F-2031-23MM     | 368          | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Attenuator                | EMTEST       | 100W 6dB DC-3G  | /            | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Signal Generator          | R&S          | SMB100A         | 103041       | May 14, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | CDN                       | LUTHI        | CDN L-801 M2/M3 | 2606         | May 14, 2022 | 1 Year        |

### 3.9. For Magnetic Field Immunity Test

| Used                                | Equipment             | Manufacturer | Model No. | Serial No. | Last Cal.    | Cal. Interval |
|-------------------------------------|-----------------------|--------------|-----------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | Magnetic Field Tester | HAEFELY      | MAG100    | 250040.1   | May 15, 2022 | 1 Year        |

### 3.10. For Voltage Dips Test

| Used                                | Equipment                      | Manufacturer | Model No.          | Serial No. | Last Cal.    | Cal. Interval |
|-------------------------------------|--------------------------------|--------------|--------------------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | 45KVA AC Power source          | Teseq        | NSG 1007-45/45KV A | 1305A02873 | May 15, 2022 | 1 Year        |
| <input type="checkbox"/>            | Signal conditioning Unit       | Teseq        | CCN 1000-3         | 1305A02873 | May 15, 2022 | 1 Year        |
| <input type="checkbox"/>            | Impedance network              | Teseq        | INA2197/37A        | 1305A02873 | May 15, 2022 | 1 Year        |
| <input type="checkbox"/>            | Impedance network              | Teseq        | INA 2196/75A       | 1305A02874 | May 15, 2022 | 1 Year        |
| <input checked="" type="checkbox"/> | Proflin 2100 AC Switching Unit | Teseq        | NSG 2200-3         | A22714     | May 15, 2022 | 1 Year        |

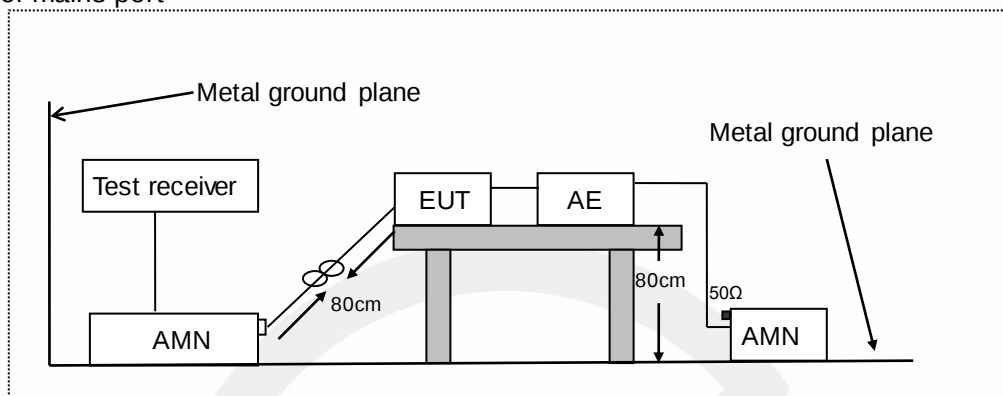
### 3.11. Low Frequency Signals Test

| Used                                | Equipment              | Manufacturer | Model No. | Serial No. | Last Cal.    | Cal. Interval |
|-------------------------------------|------------------------|--------------|-----------|------------|--------------|---------------|
| <input checked="" type="checkbox"/> | Programmable AC Source | CHROMA       | 6530      | 5341       | May 15, 2022 | 1 Year        |

## 4. CONDUCTED EMISSIONS FROM THE AC MAINS POWER PORTS

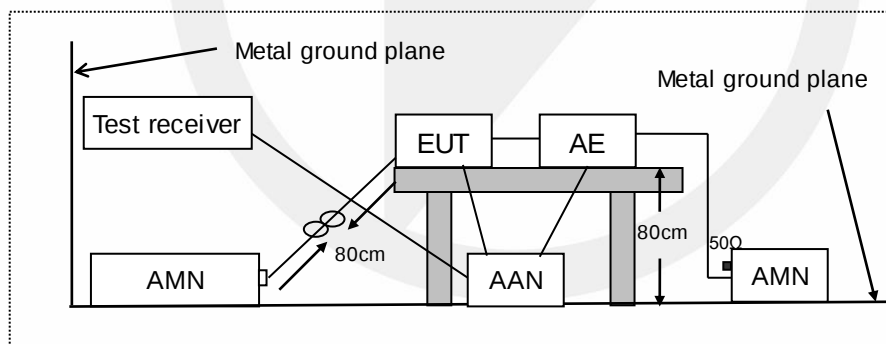
### 4.1. Block Diagram of Test Setup

For mains port



AMN: Artificial Mains Network  
AE: Associated equipment  
EUT: Equipment under test

For network port:



AMN: Artificial mains network  
AE: Associated equipment  
EUT: Equipment under test  
AAN: Asymmetric artificial network

## 4.2. Limits

**Table 1 – Limits of mains terminal and network port disturbance voltage for category C1 and category C2 UPS in the frequency range 0,15 MHz to 30 MHz**

| Frequency range<br><br>MHz                                                     | Limits<br>dB (μV)     |                       |                       |                       |                 |         |                       |                       |
|--------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------|---------|-----------------------|-----------------------|
|                                                                                | Category C1 UPS       |                       |                       |                       | 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 <sup>b</sup>                                                      | 66 to 56 <sup>a</sup> | 56 to 46 <sup>a</sup> | 84 to 74 <sup>a</sup> | 74 to 64 <sup>a</sup> | 79              | 66      | 97 to 87 <sup>a</sup> | 84 to 74 <sup>a</sup> |
| 0,50 to 5 <sup>b</sup>                                                         | 56                    | 46                    | 74                    | 64                    | 73              | 60      | 87                    | 74                    |
| 5 to 30                                                                        | 60                    | 50                    |                       |                       | 73              | 60      |                       |                       |
| <sup>a</sup> The limit decreases linearly with the logarithm of the frequency. |                       |                       |                       |                       |                 |         |                       |                       |
| <sup>b</sup> The lower limit shall apply at the transition frequency.          |                       |                       |                       |                       |                 |         |                       |                       |

**Table 2 – 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<br><br>A                                              | Frequency range<br><br>MHz | Limits<br>dB (μV)     |                       |                         |                       |
|--------------------------------------------------------------------------------|----------------------------|-----------------------|-----------------------|-------------------------|-----------------------|
|                                                                                |                            | Mains terminal        |                       | Network port            |                       |
|                                                                                |                            | Quasi-peak            | Average               | Quasi-peak              | Average               |
| > 16 to 100                                                                    | 0,15 to 0,50 <sup>b</sup>  | 100                   | 90                    | 110 to 100 <sup>a</sup> | 94 to 84 <sup>a</sup> |
|                                                                                | 0,50 to 5,0 <sup>b</sup>   | 86                    | 76                    | 100                     | 84                    |
|                                                                                | 5,0 to 30,0                | 90 to 73 <sup>a</sup> | 80 to 60 <sup>a</sup> |                         |                       |
| > 100                                                                          | 0,15 to 0,50 <sup>b</sup>  | 130                   | 120                   | 110 to 100 <sup>a</sup> | 94 to 84 <sup>a</sup> |
|                                                                                | 0,50 to 5,0 <sup>b</sup>   | 125                   | 115                   | 100                     | 84                    |
|                                                                                | 5,0 to 30,0                | 115                   | 105                   |                         |                       |
| <sup>a</sup> The limits decrease linearly with the logarithm of the frequency. |                            |                       |                       |                         |                       |
| <sup>b</sup> The lower limit shall apply at the transition frequency.          |                            |                       |                       |                         |                       |

## 4.3. Test Procedure

### For mains port:

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a artificial mains network (AMN). Where the mains cable

supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other AMN.

The AMN provides 50 ohm coupling impedance for the measuring instrument.

The CISPR states that the AMN with 50 ohm and 50 microhenry should be used.

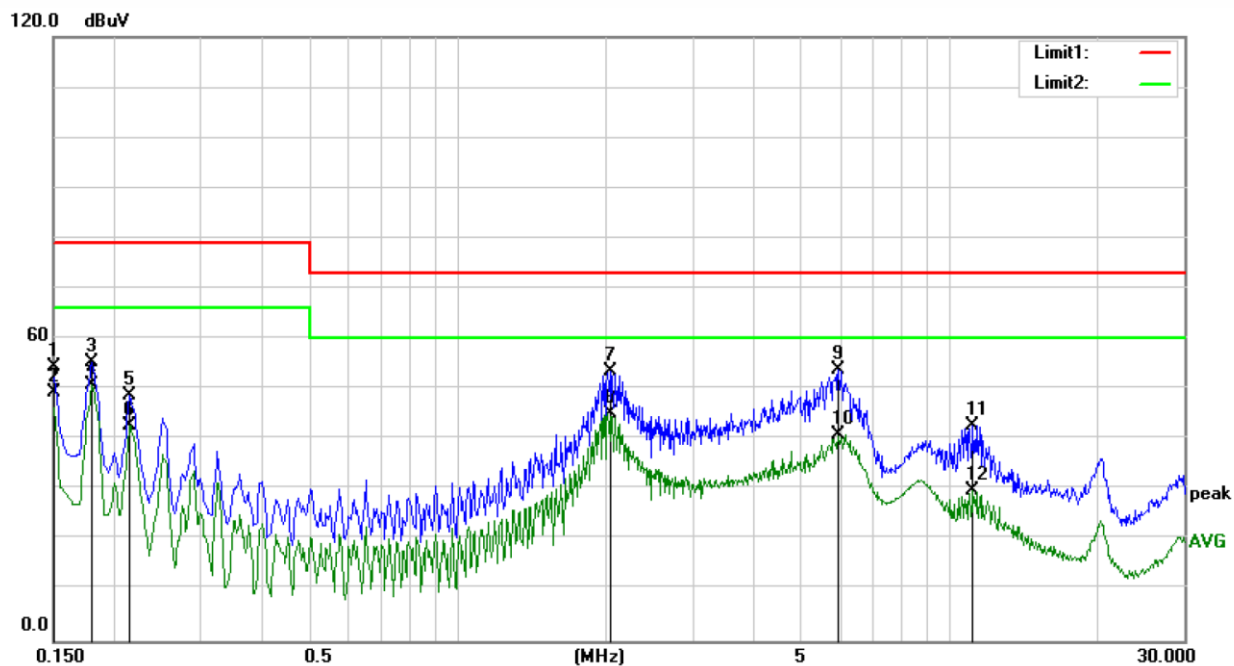
Both sides of AC line were checked for maximum conducted interference.

#### 4.4. Measuring Results

**PASS.**

Please see the attached pages.

|                      |   |            |
|----------------------|---|------------|
| Temperature          | : | 21.9°C     |
| Humidity             | : | 58%        |
| Atmospheric Pressure | : | 101kpa     |
| Test Engineer        | : | HL         |
| Test Date            | : | 2022-11-11 |



Site Conduction #1

Phase: **L1**

Temperature: 21.9

Limit: (CE)EN62040-2 C2\_QP

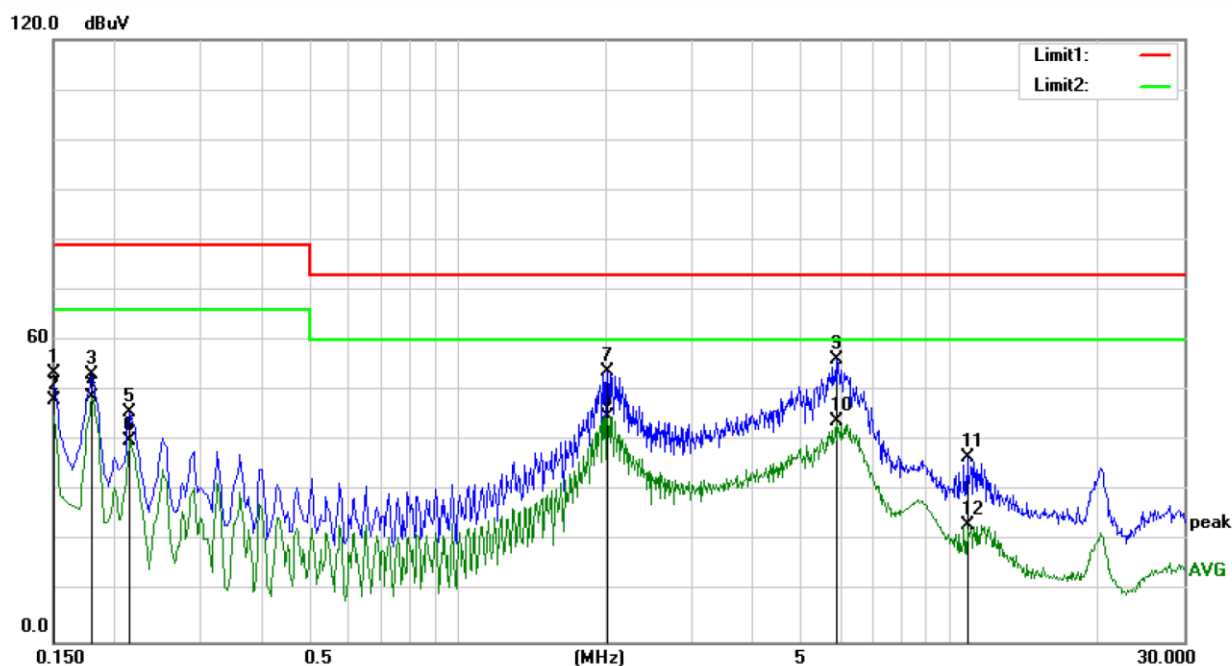
Power: AC 230V/50Hz

Humidity: 58 %

Mode: Line mode

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.1500       | 44.76                    | 9.81                    | 54.57                    | 79.00         | -24.43     | QP       |         |
| 2   |     | 0.1500       | 39.59                    | 9.81                    | 49.40                    | 66.00         | -16.60     | AVG      |         |
| 3   |     | 0.1800       | 45.68                    | 9.74                    | 55.42                    | 79.00         | -23.58     | QP       |         |
| 4   |     | 0.1800       | 41.11                    | 9.74                    | 50.85                    | 66.00         | -15.15     | AVG      |         |
| 5   |     | 0.2150       | 38.98                    | 9.72                    | 48.70                    | 79.00         | -30.30     | QP       |         |
| 6   |     | 0.2150       | 33.10                    | 9.72                    | 42.82                    | 66.00         | -23.18     | AVG      |         |
| 7   |     | 2.0500       | 43.97                    | 9.59                    | 53.56                    | 73.00         | -19.44     | QP       |         |
| 8   | *   | 2.0500       | 35.43                    | 9.59                    | 45.02                    | 60.00         | -14.98     | AVG      |         |
| 9   |     | 5.9550       | 44.16                    | 9.68                    | 53.84                    | 73.00         | -19.16     | QP       |         |
| 10  |     | 5.9550       | 31.30                    | 9.68                    | 40.98                    | 60.00         | -19.02     | AVG      |         |
| 11  |     | 11.1550      | 33.02                    | 9.75                    | 42.77                    | 73.00         | -30.23     | QP       |         |
| 12  |     | 11.1550      | 20.11                    | 9.75                    | 29.86                    | 60.00         | -30.14     | AVG      |         |



Site Conduction #1

Phase: **N**

Temperature: 21.9

Limit: (CE)EN62040-2 C2\_QP

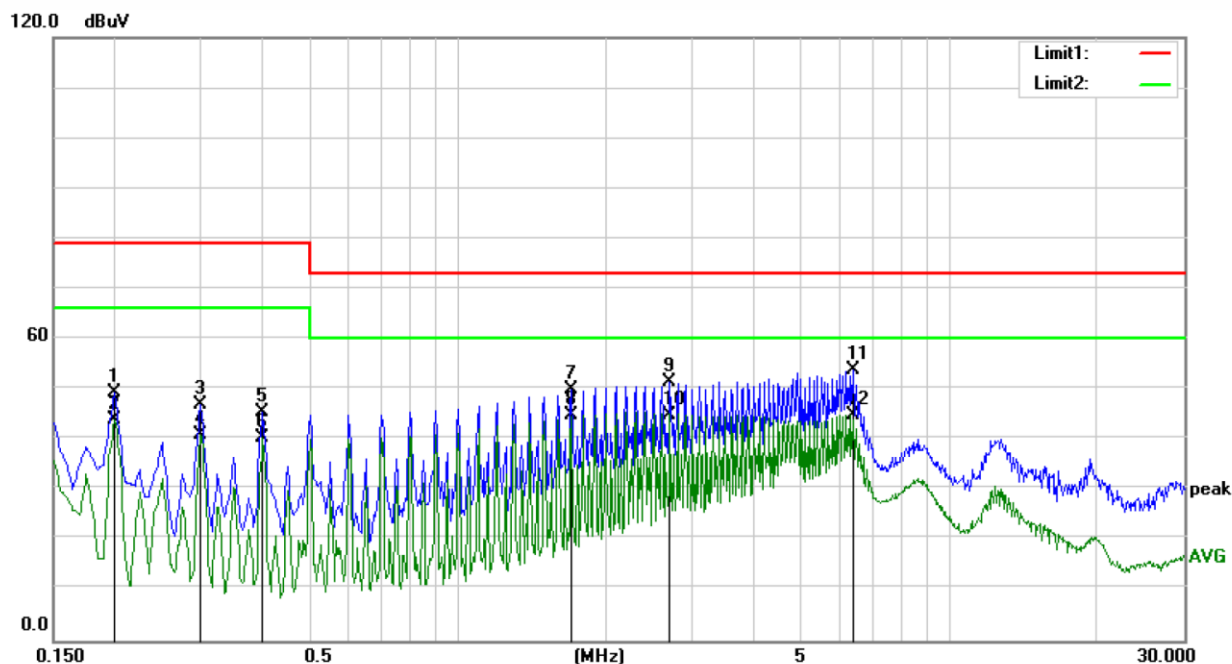
Power: AC 230V/50Hz

Humidity: 58 %

Mode: Line mode

Note:

| No. | Mk. | Freq.   | Reading | Correct | Measure- | Limit | Over   |          |         |
|-----|-----|---------|---------|---------|----------|-------|--------|----------|---------|
|     |     | MHz     | dBuV    | Factor  | ment     | dBuV  | dB     | Detector | Comment |
| 1   |     | 0.1500  | 43.79   | 9.81    | 53.60    | 79.00 | -25.40 | QP       |         |
| 2   |     | 0.1500  | 38.38   | 9.81    | 48.19    | 66.00 | -17.81 | AVG      |         |
| 3   |     | 0.1800  | 43.60   | 9.74    | 53.34    | 79.00 | -25.66 | QP       |         |
| 4   |     | 0.1800  | 39.12   | 9.74    | 48.86    | 66.00 | -17.14 | AVG      |         |
| 5   |     | 0.2150  | 36.04   | 9.72    | 45.76    | 79.00 | -33.24 | QP       |         |
| 6   |     | 0.2150  | 30.37   | 9.72    | 40.09    | 66.00 | -25.91 | AVG      |         |
| 7   |     | 2.0200  | 44.24   | 9.58    | 53.82    | 73.00 | -19.18 | QP       |         |
| 8   | *   | 2.0200  | 35.37   | 9.58    | 44.95    | 60.00 | -15.05 | AVG      |         |
| 9   |     | 5.8800  | 46.45   | 9.68    | 56.13    | 73.00 | -16.87 | QP       |         |
| 10  |     | 5.8800  | 34.15   | 9.68    | 43.83    | 60.00 | -16.17 | AVG      |         |
| 11  |     | 10.8550 | 26.98   | 9.75    | 36.73    | 73.00 | -36.27 | QP       |         |
| 12  |     | 10.8550 | 13.58   | 9.75    | 23.33    | 60.00 | -36.67 | AVG      |         |



Site Conduction #1

Phase: **L1**

Temperature: 21.9

Limit: (CE)EN62040-2 C2\_QP

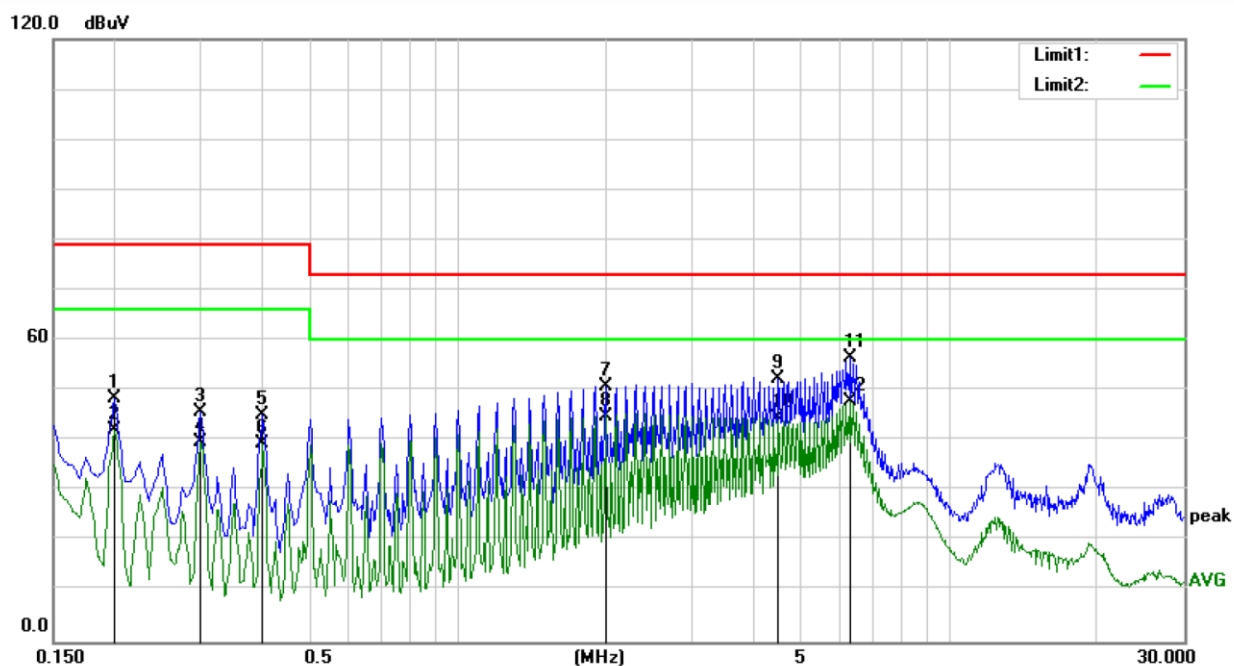
Power: DC 24V

Humidity: 58 %

Mode: Battery mode

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.2000       | 39.72                    | 9.70                    | 49.42                    | 79.00         | -29.58     | QP       |         |
| 2   |     | 0.2000       | 34.38                    | 9.70                    | 44.08                    | 66.00         | -21.92     | AVG      |         |
| 3   |     | 0.3000       | 37.08                    | 9.80                    | 46.88                    | 79.00         | -32.12     | QP       |         |
| 4   |     | 0.3000       | 31.25                    | 9.80                    | 41.05                    | 66.00         | -24.95     | AVG      |         |
| 5   |     | 0.4000       | 35.93                    | 9.66                    | 45.59                    | 79.00         | -33.41     | QP       |         |
| 6   |     | 0.4000       | 30.82                    | 9.66                    | 40.48                    | 66.00         | -25.52     | AVG      |         |
| 7   |     | 1.7000       | 40.32                    | 9.58                    | 49.90                    | 73.00         | -23.10     | QP       |         |
| 8   |     | 1.7000       | 35.14                    | 9.58                    | 44.72                    | 60.00         | -15.28     | AVG      |         |
| 9   |     | 2.7000       | 41.67                    | 9.67                    | 51.34                    | 73.00         | -21.66     | QP       |         |
| 10  | *   | 2.7000       | 35.13                    | 9.67                    | 44.80                    | 60.00         | -15.20     | AVG      |         |
| 11  |     | 6.3800       | 44.11                    | 9.67                    | 53.78                    | 73.00         | -19.22     | QP       |         |
| 12  |     | 6.3800       | 35.11                    | 9.67                    | 44.78                    | 60.00         | -15.22     | AVG      |         |



Site Conduction #1

Phase: **N**  
Power: DC 24VTemperature: 21.9  
Humidity: 58 %

Limit: (CE)EN62040-2 C2\_QP

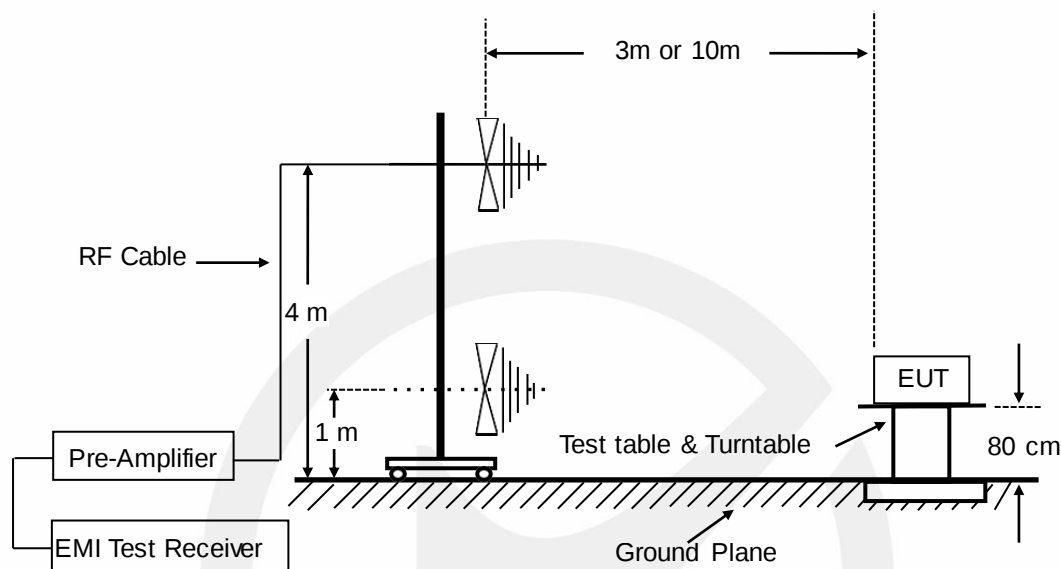
Mode: Battery mode

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.2000       | 38.61                    | 9.70                    | 48.31                    | 79.00         | -30.69     | QP       |         |
| 2   |     | 0.2000       | 32.35                    | 9.70                    | 42.05                    | 66.00         | -23.95     | AVG      |         |
| 3   |     | 0.3000       | 35.98                    | 9.80                    | 45.78                    | 79.00         | -33.22     | QP       |         |
| 4   |     | 0.3000       | 30.00                    | 9.80                    | 39.80                    | 66.00         | -26.20     | AVG      |         |
| 5   |     | 0.4000       | 35.49                    | 9.66                    | 45.15                    | 79.00         | -33.85     | QP       |         |
| 6   |     | 0.4000       | 29.71                    | 9.66                    | 39.37                    | 66.00         | -26.63     | AVG      |         |
| 7   |     | 2.0000       | 41.39                    | 9.58                    | 50.97                    | 73.00         | -22.03     | QP       |         |
| 8   |     | 2.0000       | 35.42                    | 9.58                    | 45.00                    | 60.00         | -15.00     | AVG      |         |
| 9   |     | 4.5000       | 42.72                    | 9.69                    | 52.41                    | 73.00         | -20.59     | QP       |         |
| 10  |     | 4.5000       | 34.95                    | 9.69                    | 44.64                    | 60.00         | -15.36     | AVG      |         |
| 11  |     | 6.2800       | 46.83                    | 9.67                    | 56.50                    | 73.00         | -16.50     | QP       |         |
| 12  | *   | 6.2800       | 38.09                    | 9.67                    | 47.76                    | 60.00         | -12.24     | AVG      |         |

## 5. RADIATED EMISSION MEASUREMENT (UP TO 1GHZ)

### 5.1. Block Diagram of Test Setup



### 5.2. Radiated Limit

**Table 3 – Limits of radiated emission in the frequency range 30 MHz to 1 000 MHz**

| Frequency range<br>MHz | Quasi-peak limits<br>dB (μV/m) |                 |                 |
|------------------------|--------------------------------|-----------------|-----------------|
|                        | Category C1 UPS                | Category C2 UPS | Category C3 UPS |
| 30 to 230 <sup>a</sup> | 30                             | 40              | 50              |
| 230 to 1 000           | 37                             | 47              | 60              |

<sup>a</sup> The lower limit shall apply at the transition frequency.

**NOTE 1** The test distance is 10 m. If the emission measurement at 10 m cannot be made because of high ambient noise levels or for other reasons, measurements are made at a closer distance, for example 3 m. An inverse proportionality factor of 20 dB per decade is used to normalize the measured data to the specified distance for determining compliance.

**NOTE 2** Where interference occurs additional provisions can be necessary.

### 5.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters (or 10 meters) away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:

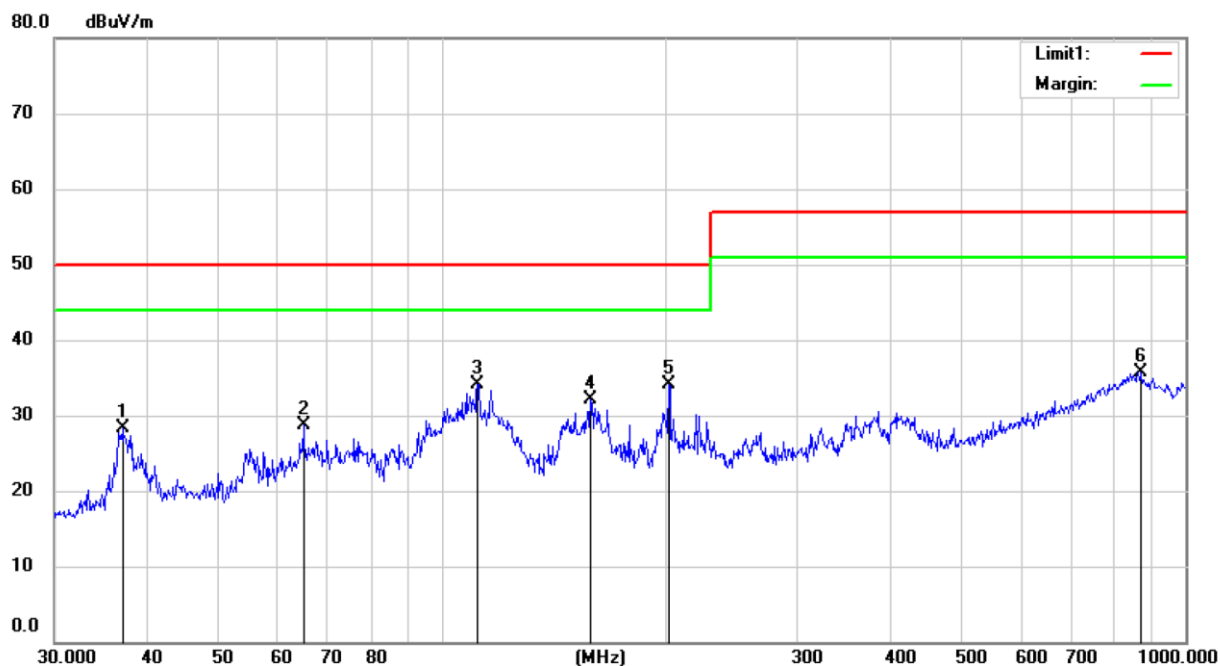
Emission level (dB $\mu$ V/m) = Antenna Factor - Amp Factor + Cable Loss + Reading  
Margin (dB) = Emission Level (dB $\mu$ V/m) - Limit (dB $\mu$ V/m)

#### 5.4. Measuring Results

**PASS.**

Please see the attached pages.

|                      |   |            |
|----------------------|---|------------|
| Temperature          | : | 28.1°C     |
| Humidity             | : | 43%        |
| Atmospheric Pressure | : | 101kpa     |
| Test Engineer        | : | HL         |
| Test Date            | : | 2022-11-25 |



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 28.1 C

Limit: (RE)EN62040-2\_C2

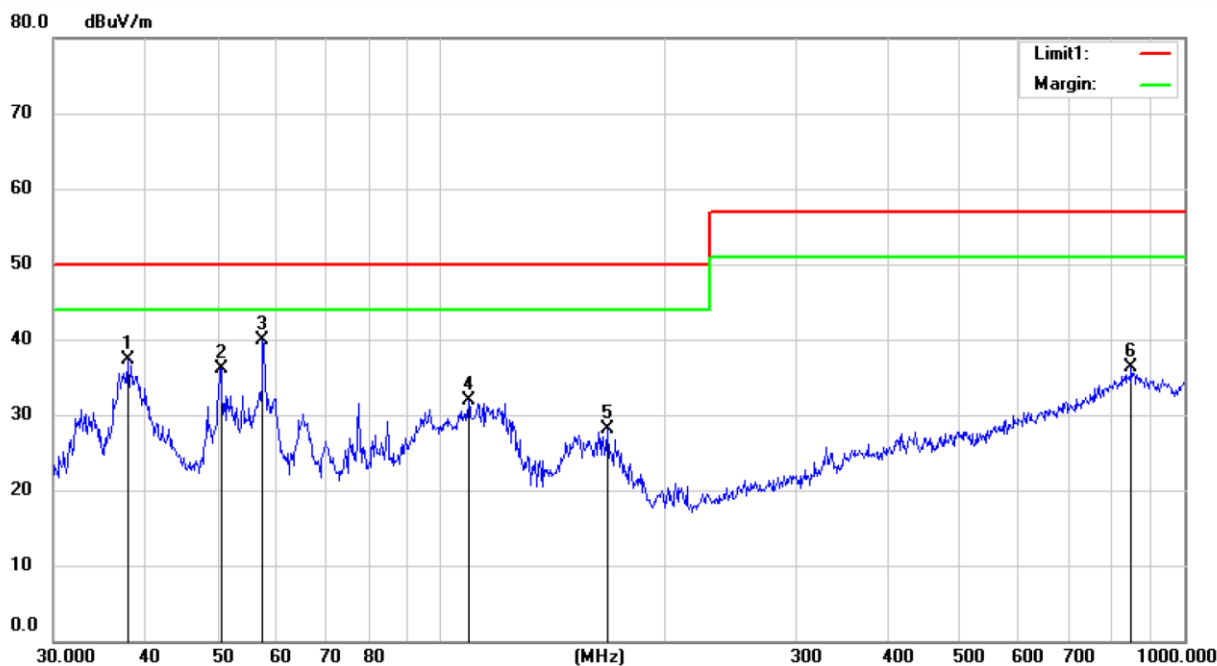
Power: AC 230V/50Hz

Humidity: 43 %

Mode: Line mode

Note:

| No. | Mk. | Freq.    | Reading | Correct | Measure- | Limit  | Over   | Antenna | Table  |         |
|-----|-----|----------|---------|---------|----------|--------|--------|---------|--------|---------|
|     |     | MHz      | Level   | Factor  | ment     |        |        | Height  | Degree |         |
|     |     |          | dBuV    | dB      | dBuV/m   | dBuV/m | dB     | cm      | degree | Comment |
| 1   |     | 37.1061  | 37.05   | -8.84   | 28.21    | 50.00  | -21.79 | QP      |        |         |
| 2   |     | 64.9720  | 36.32   | -7.57   | 28.75    | 50.00  | -21.25 | QP      |        |         |
| 3   | *   | 111.5422 | 44.30   | -10.19  | 34.11    | 50.00  | -15.89 | QP      |        |         |
| 4   |     | 158.1123 | 41.75   | -9.65   | 32.10    | 50.00  | -17.90 | QP      |        |         |
| 5   |     | 202.0118 | 43.52   | -9.41   | 34.11    | 50.00  | -15.89 | QP      |        |         |
| 6   |     | 871.0371 | 29.52   | 6.26    | 35.78    | 57.00  | -21.22 | QP      |        |         |



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 28.1 C

Limit: (RE)EN62040-2\_C2

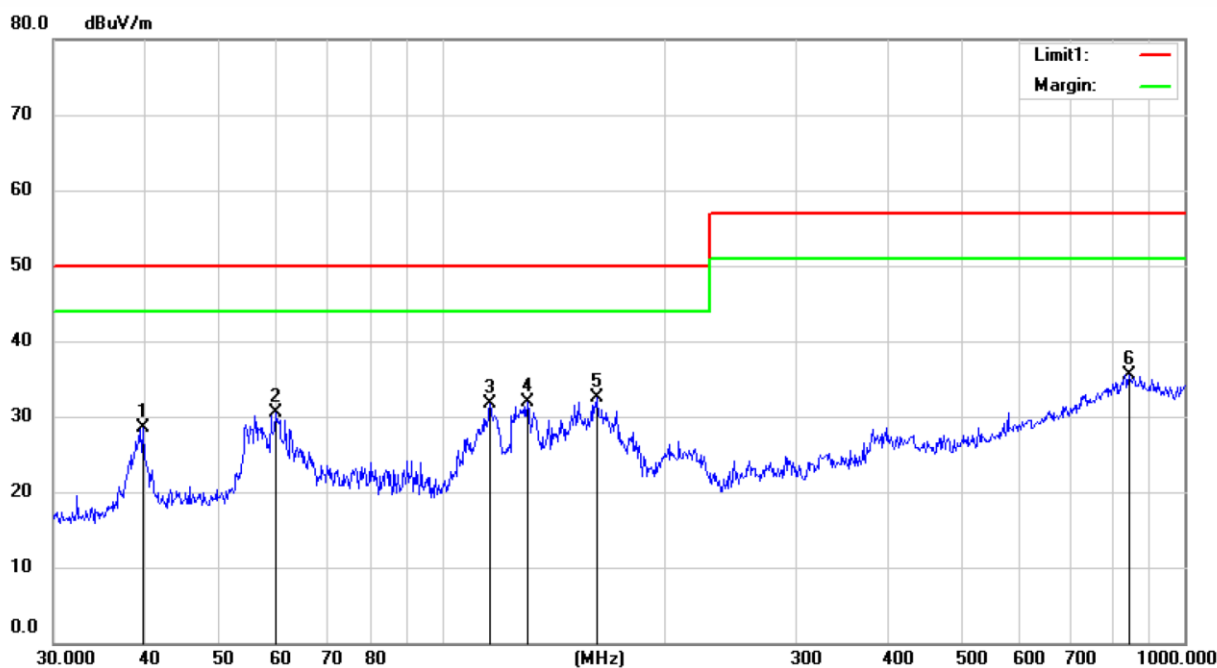
Power: AC 230V/50Hz

Humidity: 43 %

Mode: Line mode

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree<br>degree | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|-------------------------|---------------------------|---------|
| 1   |     | 37.8453      | 46.17                    | -8.81                   | 37.36                      | 50.00           | -12.64     | QP                      |                           |         |
| 2   |     | 50.4531      | 43.63                    | -7.49                   | 36.14                      | 50.00           | -13.86     | QP                      |                           |         |
| 3   | *   | 57.5686      | 47.56                    | -7.58                   | 39.98                      | 50.00           | -10.02     | QP                      |                           |         |
| 4   |     | 108.9331     | 42.26                    | -10.32                  | 31.94                      | 50.00           | -18.06     | QP                      |                           |         |
| 5   |     | 167.3834     | 38.04                    | -9.96                   | 28.08                      | 50.00           | -21.92     | QP                      |                           |         |
| 6   |     | 850.6623     | 29.66                    | 6.68                    | 36.34                      | 57.00           | -20.66     | QP                      |                           |         |



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 28.1 C

Limit: (RE)EN62040-2\_C2

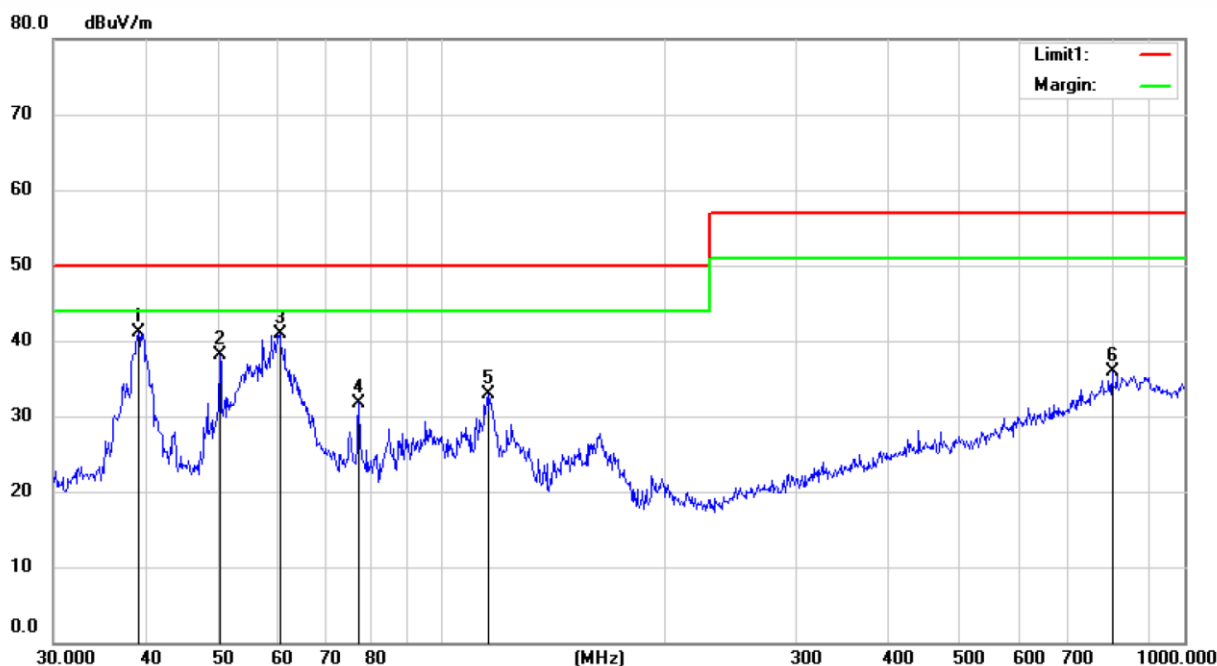
Power: DC 24V

Humidity: 43 %

Mode: Battery mode

Note:

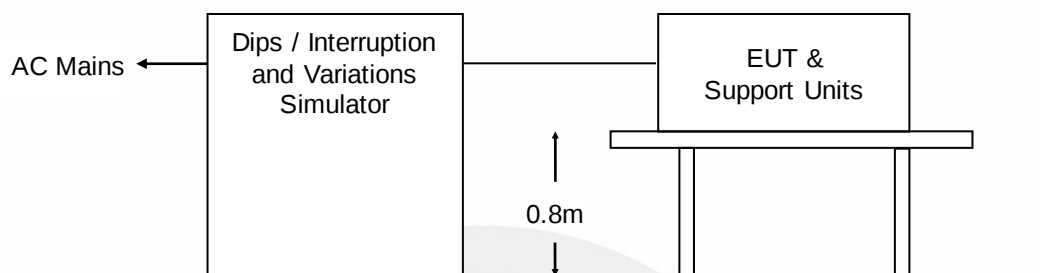
| No. | Mk. | Freq.    | Reading | Correct | Measure- | Limit  | Over   | Antenna | Table  |         |
|-----|-----|----------|---------|---------|----------|--------|--------|---------|--------|---------|
|     |     | MHz      | Level   | Factor  | ment     |        |        | Height  | Degree |         |
|     |     |          | dBuV    | dB      | dBuV/m   | dBuV/m | dB     | cm      | degree | Comment |
| 1   |     | 39.6800  | 36.85   | -8.31   | 28.54    | 50.00  | -21.46 | QP      |        |         |
| 2   |     | 59.7802  | 37.89   | -7.44   | 30.45    | 50.00  | -19.55 | QP      |        |         |
| 3   |     | 116.4890 | 41.60   | -9.90   | 31.70    | 50.00  | -18.30 | QP      |        |         |
| 4   |     | 130.7223 | 42.19   | -10.19  | 32.00    | 50.00  | -18.00 | QP      |        |         |
| 5   | *   | 162.0414 | 42.32   | -9.77   | 32.55    | 50.00  | -17.45 | QP      |        |         |
| 6   |     | 843.6074 | 28.84   | 6.61    | 35.45    | 57.00  | -21.55 | QP      |        |         |



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree<br>degree | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|-------------------------|---------------------------|---------|
| 1   | *   | 39.0930      | 49.53                    | -8.48                   | 41.05                      | 50.00           | -8.95      | QP                      |                           |         |
| 2   |     | 50.3868      | 45.58                    | -7.49                   | 38.09                      | 50.00           | -11.91     | QP                      |                           |         |
| 3   |     | 60.5715      | 48.35                    | -7.43                   | 40.92                      | 50.00           | -9.08      | QP                      |                           |         |
| 4   |     | 77.4230      | 41.85                    | -10.05                  | 31.80                      | 50.00           | -18.20     | QP                      |                           |         |
| 5   |     | 115.5736     | 42.72                    | -9.84                   | 32.88                      | 50.00           | -17.12     | QP                      |                           |         |
| 6   |     | 801.0837     | 30.34                    | 5.62                    | 35.96                      | 57.00           | -21.04     | QP                      |                           |         |

## 6. HARMONIC CURRENT EMISSION MEASUREMENT

### 6.1. Block Diagram of Test Setup



### 6.2. Measuring Standard

EN IEC 61000-3-2:2019+A1:2021

### 6.3. Operation Condition of EUT

Same as Section 6.4, except the test setup replaced as Section 6.1.

### 6.4. Measuring Results

PASS.

Please see the attached pages.

## Harmonics – Class-A per IEC 61000-3-2:2018/AMD1:2020(Run time)

EUT: Uninterruptible Power Systems

Test category: Class-A (European limits)

Test date: 2022/8/19

Start time: 0:31:44

Tested by: YJ

Test Margin: 100

End time: 0:34:26

Test duration (min): 2.5

Data file name: CTSMXL\_H-000833.cts\_data

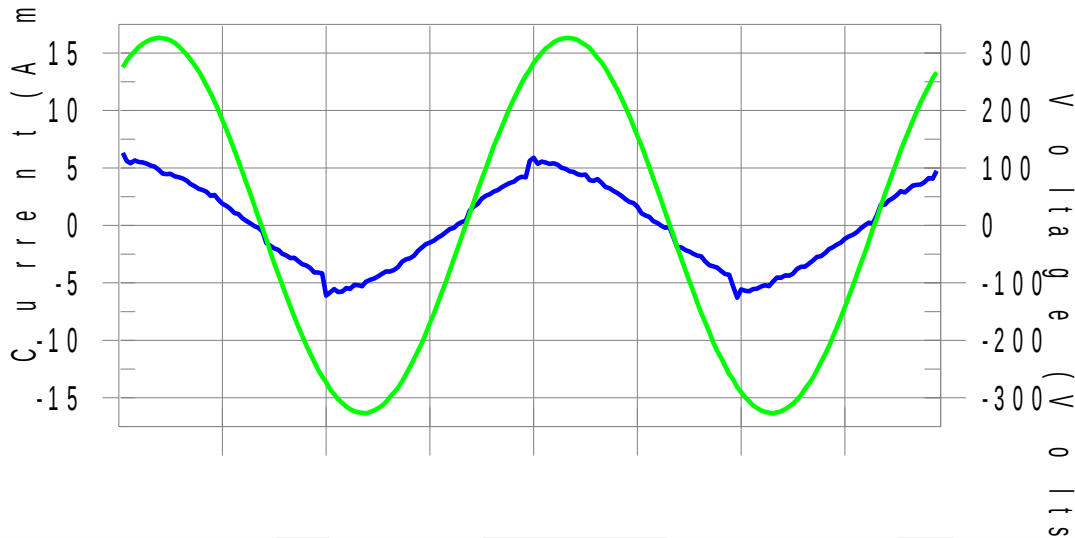
Comment: Line mode

Customer: Netcon Enterprise Pvt Ltd

Test Result: Pass

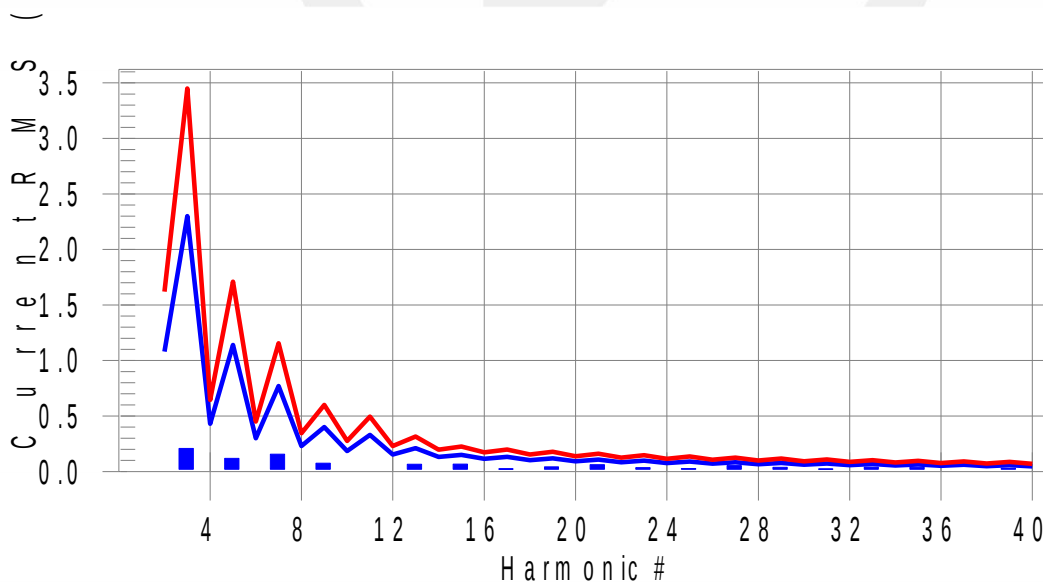
Source qualification: Normal

### Current & voltage waveforms



### Harmonics and Class A limit line

### European Limits



Test result: Pass Worst harmonics H33-46.2% of 150% limit, H27-64.4% of 100% limit.

## Current Test Result Summary (Run time)

EUT: Uninterruptible Power Systems  
Test category: Class-A (European limits)  
Test date: 2022/8/19 Start time: 0:31:44  
Test duration (min): 2.5 Data file name: CTSXML\_H-000833.cts\_data  
Comment: Line mode  
Customer: Netcon Enterprise Pvt Ltd

Tested by: YJ  
Test Margin: 100  
End time: 0:34:26

Test Result: Pass Source qualification: Normal  
THC(A): 0.337 I-THD(%): 9.4 POHC(A): 0.121 POHC Limit(A): 0.251

### Highest parameter values during test:

V\_RMS (Volts): 230.851  
I\_Peak (Amps): 6.658  
I\_Fund (Amps): 3.592  
Power (Watts): 814.0  
Frequency(Hz): 50.00  
I\_RMS (Amps): 3.618  
Crest Factor: 1.847  
Power Factor: 0.978

| Harm# | Harms(avg) | 100%Limit | %of Limit | Harms(max) | 150%Limit | %of Limit | Status |
|-------|------------|-----------|-----------|------------|-----------|-----------|--------|
| 2     | 0.006      | 1.080     | N/A       | 0.007      | 1.620     | N/A       | Pass   |
| 3     | 0.208      | 2.300     | 9.0       | 0.211      | 3.450     | 6.1       | Pass   |
| 4     | 0.002      | 0.430     | N/A       | 0.003      | 0.645     | N/A       | Pass   |
| 5     | 0.119      | 1.140     | 10.5      | 0.120      | 1.710     | 7.0       | Pass   |
| 6     | 0.002      | 0.300     | N/A       | 0.003      | 0.450     | N/A       | Pass   |
| 7     | 0.156      | 0.770     | 20.3      | 0.157      | 1.155     | 13.6      | Pass   |
| 8     | 0.001      | 0.230     | N/A       | 0.004      | 0.345     | N/A       | Pass   |
| 9     | 0.076      | 0.400     | 18.9      | 0.077      | 0.600     | 12.8      | Pass   |
| 10    | 0.001      | 0.184     | N/A       | 0.003      | 0.276     | N/A       | Pass   |
| 11    | 0.013      | 0.330     | N/A       | 0.015      | 0.495     | N/A       | Pass   |
| 12    | 0.001      | 0.153     | N/A       | 0.004      | 0.230     | N/A       | Pass   |
| 13    | 0.065      | 0.210     | 31.1      | 0.067      | 0.315     | 21.1      | Pass   |
| 14    | 0.002      | 0.131     | N/A       | 0.004      | 0.197     | N/A       | Pass   |
| 15    | 0.067      | 0.150     | 44.8      | 0.070      | 0.225     | 31.1      | Pass   |
| 16    | 0.001      | 0.115     | N/A       | 0.003      | 0.173     | N/A       | Pass   |
| 17    | 0.024      | 0.132     | 18.2      | 0.025      | 0.198     | 12.7      | Pass   |
| 18    | 0.001      | 0.102     | N/A       | 0.003      | 0.153     | N/A       | Pass   |
| 19    | 0.042      | 0.118     | 35.3      | 0.043      | 0.178     | 24.1      | Pass   |
| 20    | 0.001      | 0.092     | N/A       | 0.003      | 0.138     | N/A       | Pass   |
| 21    | 0.062      | 0.107     | 57.6      | 0.063      | 0.161     | 39.3      | Pass   |
| 22    | 0.002      | 0.084     | N/A       | 0.003      | 0.125     | N/A       | Pass   |
| 23    | 0.034      | 0.098     | 35.1      | 0.036      | 0.147     | 24.3      | Pass   |
| 24    | 0.001      | 0.077     | N/A       | 0.003      | 0.115     | N/A       | Pass   |
| 25    | 0.026      | 0.090     | 29.2      | 0.028      | 0.135     | 20.5      | Pass   |
| 26    | 0.002      | 0.071     | N/A       | 0.004      | 0.107     | N/A       | Pass   |
| 27    | 0.054      | 0.083     | 64.4      | 0.055      | 0.125     | 44.0      | Pass   |
| 28    | 0.001      | 0.066     | N/A       | 0.003      | 0.099     | N/A       | Pass   |
| 29    | 0.038      | 0.078     | 48.4      | 0.039      | 0.116     | 33.6      | Pass   |
| 30    | 0.002      | 0.061     | N/A       | 0.020      | 0.092     | N/A       | Pass   |
| 31    | 0.022      | 0.073     | 30.3      | 0.031      | 0.109     | 28.2      | Pass   |
| 32    | 0.002      | 0.058     | N/A       | 0.015      | 0.086     | N/A       | Pass   |
| 33    | 0.040      | 0.068     | 59.0      | 0.047      | 0.102     | 46.2      | Pass   |
| 34    | 0.002      | 0.054     | N/A       | 0.014      | 0.081     | N/A       | Pass   |
| 35    | 0.038      | 0.064     | 59.0      | 0.041      | 0.096     | 42.4      | Pass   |
| 36    | 0.002      | 0.051     | N/A       | 0.015      | 0.077     | N/A       | Pass   |
| 37    | 0.016      | 0.061     | N/A       | 0.024      | 0.091     | N/A       | Pass   |
| 38    | 0.003      | 0.048     | N/A       | 0.021      | 0.073     | N/A       | Pass   |
| 39    | 0.030      | 0.058     | 51.2      | 0.033      | 0.087     | 38.0      | Pass   |
| 40    | 0.003      | 0.046     | N/A       | 0.009      | 0.069     | N/A       | Pass   |

## Voltage Source Verification Data (Run time)

EUT: Uninterruptible Power Systems  
Test category: Class-A (European limits)  
Test date: 2022/8/19 Start time: 0:31:44  
Test duration (min): 2.5 Data file name: CTSMXL\_H-000833.cts\_data  
Comment: Line mode  
Customer: Netcon Enterprise Pvt Ltd

Tested by: YJ  
Test Margin: 100  
End time: 0:34:26

Test Result: Pass Source qualification: Normal

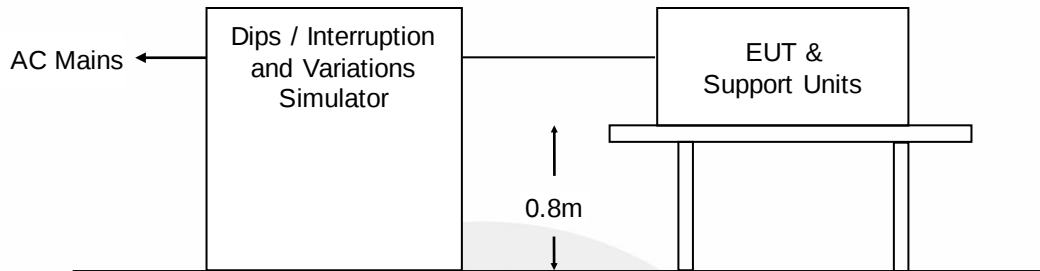
### Highest parameter values during test:

Voltage (Vrms): 230.851  
I\_Peak (Amps): 6.658  
I\_Fund (Amps): 3.592  
Power (Watts): 814.0  
Frequency(Hz): 50.00  
I\_RMS (Amps): 3.618  
Crest Factor: 1.847  
Power Factor: 0.978

| Harm# | Harmonics V-rms | Limit V-rms | % of Limit | Status |
|-------|-----------------|-------------|------------|--------|
| 2     | 0.085           | 0.462       | 18.47      | OK     |
| 3     | 0.135           | 2.077       | 6.51       | OK     |
| 4     | 0.028           | 0.462       | 6.14       | OK     |
| 5     | 0.089           | 0.923       | 9.69       | OK     |
| 6     | 0.019           | 0.462       | 4.19       | OK     |
| 7     | 0.112           | 0.692       | 16.12      | OK     |
| 8     | 0.020           | 0.462       | 4.40       | OK     |
| 9     | 0.052           | 0.462       | 11.24      | OK     |
| 10    | 0.018           | 0.462       | 4.00       | OK     |
| 11    | 0.065           | 0.231       | 28.02      | OK     |
| 12    | 0.008           | 0.231       | 3.68       | OK     |
| 13    | 0.070           | 0.231       | 30.24      | OK     |
| 14    | 0.011           | 0.231       | 4.90       | OK     |
| 15    | 0.037           | 0.231       | 16.02      | OK     |
| 16    | 0.009           | 0.231       | 3.81       | OK     |
| 17    | 0.024           | 0.231       | 10.25      | OK     |
| 18    | 0.007           | 0.231       | 3.15       | OK     |
| 19    | 0.044           | 0.231       | 18.93      | OK     |
| 20    | 0.012           | 0.231       | 5.01       | OK     |
| 21    | 0.069           | 0.231       | 29.80      | OK     |
| 22    | 0.008           | 0.231       | 3.50       | OK     |
| 23    | 0.048           | 0.231       | 20.99      | OK     |
| 24    | 0.008           | 0.231       | 3.47       | OK     |
| 25    | 0.030           | 0.231       | 12.90      | OK     |
| 26    | 0.010           | 0.231       | 4.37       | OK     |
| 27    | 0.081           | 0.231       | 34.90      | OK     |
| 28    | 0.008           | 0.231       | 3.48       | OK     |
| 29    | 0.058           | 0.231       | 25.35      | OK     |
| 30    | 0.037           | 0.231       | 15.82      | OK     |
| 31    | 0.036           | 0.231       | 15.42      | OK     |
| 32    | 0.027           | 0.231       | 11.53      | OK     |
| 33    | 0.080           | 0.231       | 34.47      | OK     |
| 34    | 0.029           | 0.231       | 12.73      | OK     |
| 35    | 0.075           | 0.231       | 32.37      | OK     |
| 36    | 0.030           | 0.231       | 12.81      | OK     |
| 37    | 0.036           | 0.231       | 15.43      | OK     |
| 38    | 0.045           | 0.231       | 19.30      | OK     |
| 39    | 0.064           | 0.231       | 27.74      | OK     |
| 40    | 0.049           | 0.231       | 21.08      | OK     |

## 7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

### 7.1. Block Diagram of Test Setup



### 7.2. Standard Limits

EN 61000-3-3:2013+A2:2021 Limits

The objective of voltage changes, voltage fluctuations and flicker in public low voltage supply systems during equipment with rated currents  $\leq 16$  A per phase, ensures that home appliances and certain other electrical equipment do not adversely affect lighting equipment when connected to the same power system.

Voltage Fluctuation and Flicker Limits:

- the value of  $P_{st}$  shall not be greater than 1.0;
- the value of  $P_{lt}$  shall not be greater than 0.65;
- the value of  $d(t)$  during a voltage change shall not exceed 3.3 % for more than 500 ms;
- the relative steady-state voltage change,  $dc$ , shall not exceed 3.3 %;
- the maximum relative voltage change,  $d_{max}$ , shall not exceed 4.0 %;

Test Procedure

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of 8% is achieved during the whole assessment procedure.

### 7.3. Test Results

PASS.

Please see the attached page.

## Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT: Uninterruptible Power Systems  
 Test category: All parameters (European limits)  
 Test date: 2022/8/19 Start time: 0:37:19  
 Test duration (min): 10 Data file name: CTSMXL\_F-000834.cts\_data  
 Comment: Line mode  
 Customer: Netcon Enterprise Pvt Ltd

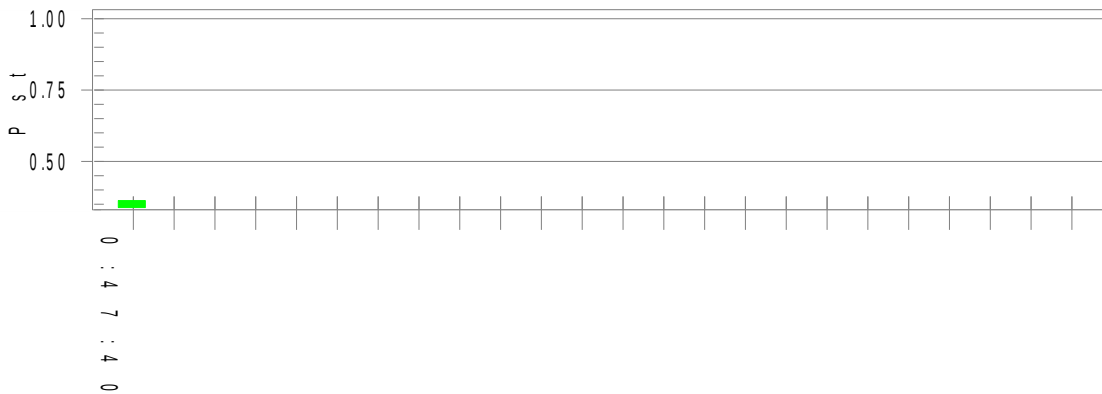
Tested by: YJ  
 Test Margin: 100  
 End time: 0:47:46

Test Result: Pass

Status: Test Completed

### Pst and limit line

### European Limits



### Parameter values recorded during the test:

|                                 |        |                  |            |
|---------------------------------|--------|------------------|------------|
| Vrms at the end of test (Volt): | 230.69 |                  |            |
| T-max (mS):                     | 0.0    | Test limit (mS): | 500.0 Pass |
| Highest dc (%):                 | 0.00   | Test limit (%):  | 3.30 Pass  |
| Highest dmax (%):               | -0.03  | Test limit (%):  | 4.00 Pass  |
| Highest Pst (10 min. period):   | 0.362  | Test limit:      | 1.000 Pass |
| Highest Plt (2 hr. period):     | 0.158  | Test limit:      | 0.650 Pass |

## 8. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION

### Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

EN IEC 62040-2:

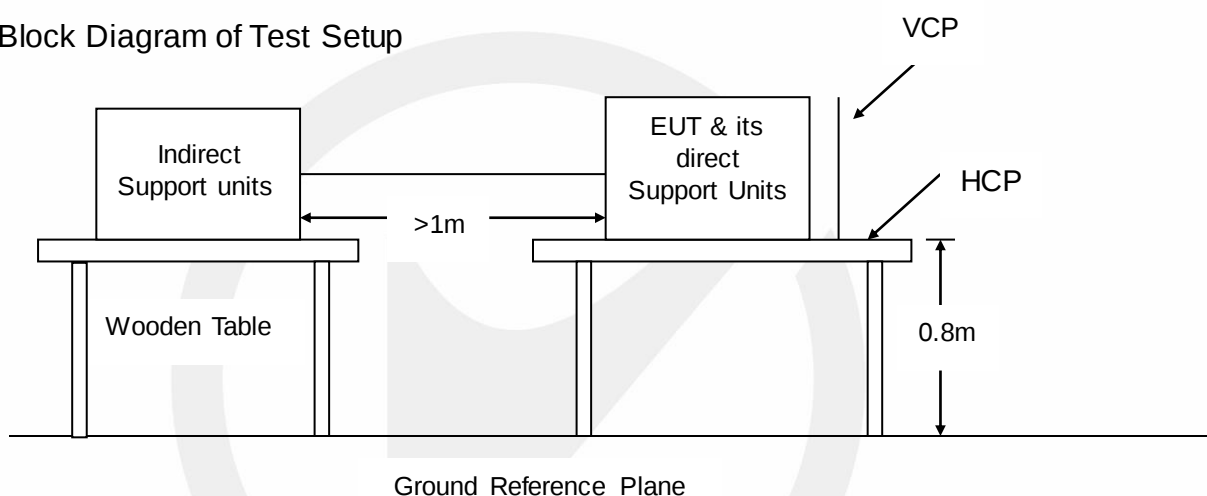
|                                                | Criterion A                                                                                                                                       | Criterion B                                                                                                                                    |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Output characteristics                         | Voltage permitted to vary only within the steady-state characteristics applicable ( $\geq 100\text{ms}$ limits in Figures 1, 2 or 3 of EN62040-3) | Voltage permitted to vary within the inverse time characteristics applicable ( $< 100\text{ m sec}$ limits in Figures 1, 2 or 3 of EN 62040-3) |
| External and internal indications and metering | Change only during test                                                                                                                           | Change only during test                                                                                                                        |
| Control signals to external devices            | No change                                                                                                                                         | Change only temporarily in consistency with the actual UPS mode of operation                                                                   |
| Mode of operation                              | No change                                                                                                                                         | Change only temporarily                                                                                                                        |

## 9. ELECTROSTATIC DISCHARGE

### 9.1. Test Specification

|                       |                                                                                |
|-----------------------|--------------------------------------------------------------------------------|
| Test Standard         | : EN IEC 62040-2                                                               |
| Basic Standard        | : IEC 61000-4-2                                                                |
| Performance criterion | : B                                                                            |
| Test level            | : $\pm 8.0\text{kV}$ (Air discharge)<br>$\pm 4.0\text{kV}$ (Contact discharge) |

### 9.2. Block Diagram of Test Setup



### 9.3. Test Procedure

- In the case of air discharge testing, the climatic conditions shall be within the following ranges:
  - ambient temperature:  $15^{\circ}\text{C}$  to  $35^{\circ}\text{C}$ ;
  - relative humidity : 30% to 60%;
  - atmospheric pressure :  $86\text{ kPa}$  ( $860\text{ mbar}$ ) to  $106\text{ kPa}$  ( $1060\text{ mbar}$ )
- Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.
- In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.
- In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :
  - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
  - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
  - The contact discharge test shall not be applied to such surfaces.
- In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

- f. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.
- g. The test shall be performed with both air discharge and contact discharge. According to the CE severity level on pre-selected points, at least 10 single discharges (in the most sensitive polarity) shall be applied on air discharge and at least 25 single discharges (in the most sensitive polarity) shall be applied on contact discharge. For the time interval between successive single discharges, an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.
- h. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

#### 9.4. Test Results

##### PASS

Temperature : 21.7°C  
 Humidity : 51%  
 Atmospheric Pressure : 101kpa  
 Test Engineer : YJ  
 Test Date : 2022-08-18

##### Air Discharge:

| Amount of discharge | Test Voltage | Location                 | Actual criterion | Required performance criterion | Result (Pass/Fail) |
|---------------------|--------------|--------------------------|------------------|--------------------------------|--------------------|
| Mini 10 /Point      | ±2, 4, 8 kV  | Slot/ LED/Button/ Screen | A                | B                              | Pass               |

##### Contact Discharge

| Amount of discharge | Test Voltage | Location    | Actual criterion | Required performance criterion | Result (Pass/Fail) |
|---------------------|--------------|-------------|------------------|--------------------------------|--------------------|
| Mini 25 /Point      | ±2; 4kV      | Metal/Screw | A                | B                              | Pass               |
|                     |              |             |                  |                                |                    |

##### Indirect Discharge

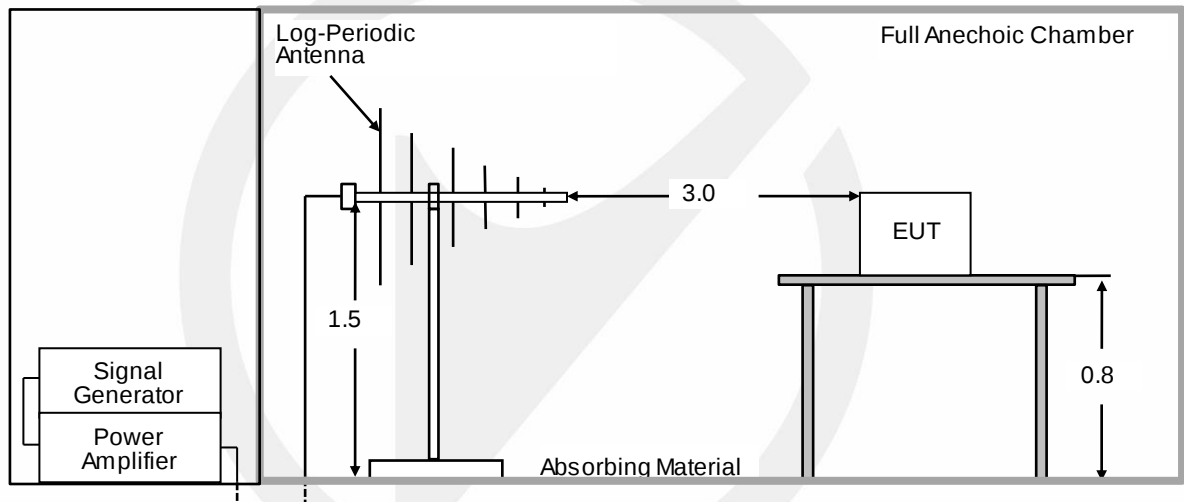
| Amount of discharge | Test Voltage | Location | Actual criterion | Required performance criterion | Result (Pass/Fail) |
|---------------------|--------------|----------|------------------|--------------------------------|--------------------|
| Mini 10 /Point      | ±2; 4kV      | HCP      | A                | B                              | Pass               |
| Mini 10 /Point      | ±2; 4kV      | VCP      | A                | B                              | Pass               |

## 10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

### 10.1. Test Specification

|                       |                          |
|-----------------------|--------------------------|
| Test Standard         | : EN IEC 62040-2         |
| Basic Standard        | : IEC 61000-4-3          |
| Performance criterion | : A                      |
| Test level            | : 10V/m                  |
| Frequency Range       | : 80M-1000MHz            |
| Modulation            | : AM 80%, 1kHz sine-wave |

### 10.2. Block Diagram of Test Setup



### 10.3. Test procedure

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

- The antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.
- The test is performed with the antenna facing the front and back sides of the EUT with. Both vertical and horizontal polarizations from antenna are tested.

#### 10.4. Test results

##### PASS

Temperature : 24.5°C  
Humidity : 46%  
Atmospheric Pressure : 101kpa  
Test Engineer : YJ  
Test Date : 2022-08-18

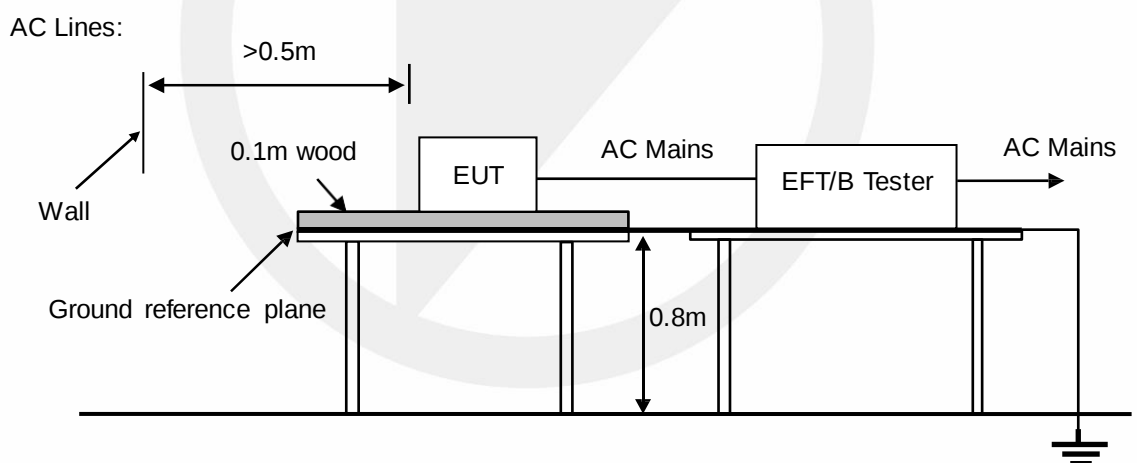
| Freq. Range (MHz) | Field | Modulation | Polarity | Position (°) | Actual criterion | Required performance criterion | Result |
|-------------------|-------|------------|----------|--------------|------------------|--------------------------------|--------|
| 80-1000           | 10V/m | AM         | H / V    | Front        | A                | A                              | Pass   |
| 80-1000           | 10V/m | AM         | H / V    | Right        | A                | A                              | Pass   |
| 80-1000           | 10V/m | AM         | H / V    | Back         | A                | A                              | Pass   |
| 80-1000           | 10V/m | AM         | H / V    | Left         | A                | A                              | Pass   |

## 11.ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

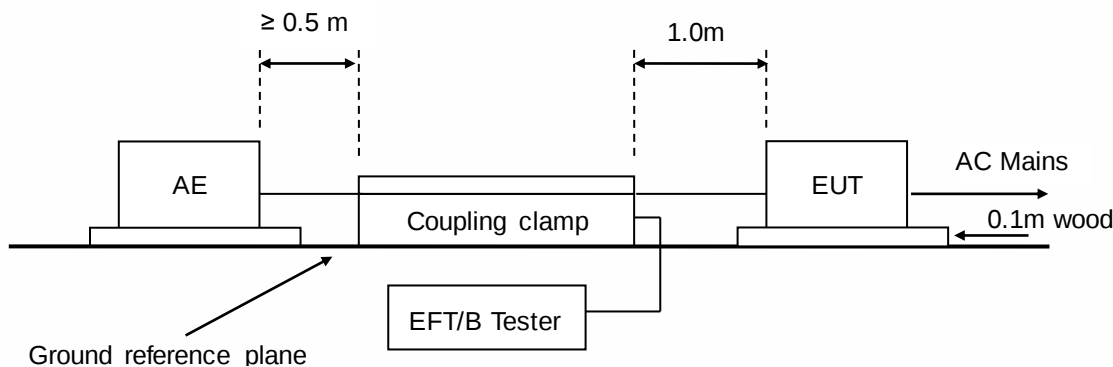
### 11.1.Test Specification

Test Standard : EN IEC 62040-2  
 Basic Standard : IEC 61000-4-4  
 Performance criterion : B  
 Test level : ☒ 2kV, AC input power ports  
                   ☒ 2kV, AC output power ports  
                   ☐ 2kV, DC port  
                   ☐ 2KV, DC interface  
                   ☐ 2kV, Network port  
 Repetition frequency : ☒ 5kHz, ☐ 100kHz  
 Tr/Th: : 5/50ns  
 Burst Period : 300ms  
 Test Time : 120s

### 11.2.Block Diagram of Test Setup



Signal lines:



### 11.3. Test Procedure

The EUT is put on the table that is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

### 11.4. Test Results

#### PASS

Temperature : 24.7°C  
Humidity : 52%  
Atmospheric Pressure : 101kpa  
Test Engineer : YJ  
Test Date : 2022-08-18

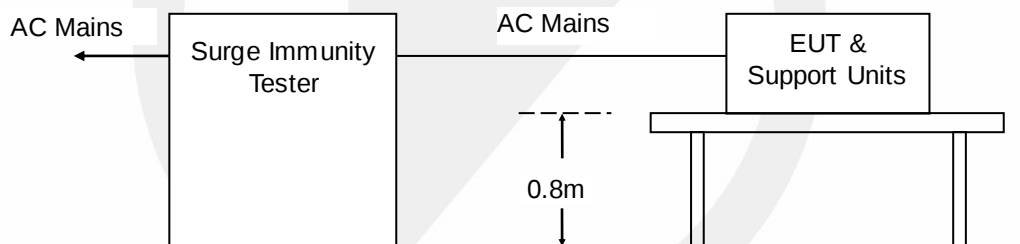
| Injection Line                                            | Voltage (kV) | Injected Method                                                                                                                            | Actual criterion | Required performance criterion | Result (Pass/Fail) |
|-----------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------|--------------------|
| <input checked="" type="checkbox"/> AC input power ports  | ± 2          | <input checked="" type="checkbox"/> CDN<br><input type="checkbox"/> Direct injection<br><input type="checkbox"/> Capacitive coupling clamp | A                | B                              | Pass               |
| <input checked="" type="checkbox"/> AC output power ports | ± 2          | <input checked="" type="checkbox"/> CDN<br><input type="checkbox"/> Direct injection<br><input type="checkbox"/> Capacitive coupling clamp | A                | B                              | Pass               |
| <input type="checkbox"/> DC port                          | ± 2          | <input type="checkbox"/> CDN<br><input type="checkbox"/> Direct injection<br><input type="checkbox"/> Capacitive coupling clamp            | N/A              | N/A                            | N/A                |
| <input type="checkbox"/> DC interface                     | ± 2          | <input type="checkbox"/> CDN<br><input type="checkbox"/> Direct injection<br><input type="checkbox"/> Capacitive coupling clamp            | N/A              | N/A                            | N/A                |
| <input type="checkbox"/> Network port                     | ± 2          | <input type="checkbox"/> CDN<br><input type="checkbox"/> Direct injection<br><input checked="" type="checkbox"/> Capacitive coupling clamp | N/A              | N/A                            | N/A                |

## 12.SURGE IMMUNITY TEST

### 12.1.Test Specification

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Standard    | : EN IEC 62040-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Basic Standard   | : IEC 61000-4-5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Test level       | : <input checked="" type="checkbox"/> 1.0kV, Line - Line, AC input power ports, Criterion B<br><input checked="" type="checkbox"/> 2.0kV, Line - Earth, AC input power ports, Criterion B<br><input type="checkbox"/> 1.0kV, Line - Line, AC output power ports, Criterion B<br><input type="checkbox"/> 2.0kV, Line - Earth, AC output power ports, Criterion B<br><input type="checkbox"/> 1.0kV, Line - Line, DC port, Criterion B<br><input type="checkbox"/> 2.0kV, Line - Earth, DC port, Criterion B<br><input type="checkbox"/> 1.0kV, Network ports, Criterion B |
| Number of surges | : 5 (for each combination of parameters)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Repetition rate  | : 1 minute / time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Polarity:        | : Positive / Negative                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Phase angle:     | : 0°, 90°, 180°, 270°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### 12.2.Block Diagram of Test Setup



### 12.3.Test Procedure

This test simulates a lightning event by inducing transients onto the AC/DC power supply lines in common mode (Line to Ground) and differential mode (Line to Line). Each device was tested in a total of two surge configurations: Line to Ground (L-G): Combination Wave, Line to Protective Earth with 9uF and 10Ohm and Neutral to Protective Earth with 9uF and 10Ohm, common mode, generator earthed.

Line to Line (L-L): Combination Wave,

Line to Neutral with 18uF, differential mode, generator floated.

2 ohm : the source impedance of the low-voltage power supply network.

12 ohm : the source impedance of the low-voltage power supply network and ground.

- If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the a.c. voltage wave (positive and negative).
- The surges have to be applied line to line and line to earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.
- The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan. All lower levels including the selected test level shall be satisfied.
- For testing the secondary protection, the output voltage of the generator shall be increased up to the

worst-case voltage breakdown level (let-through level) of the primary protection.

e. Testing shall be performed according to a Test Plan, which shall be included in the test report.

f. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied.

## 12.4. Test results

### PASS

Temperature : 24.7°C  
Humidity : 52%  
Atmospheric Pressure : 101kpa  
Test Engineer : YJ  
Test Date : 2022-08-18

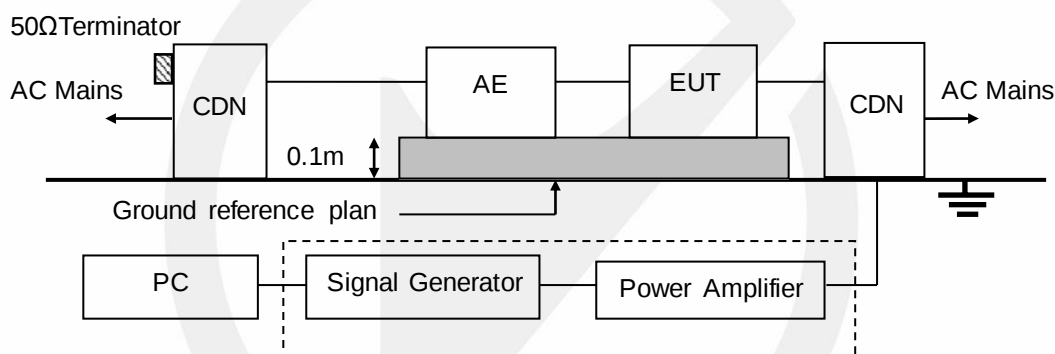
| Coupling Line                                                            | Voltage (kV) | Waveform (μs) | Polarity   | Actual criterion | Required performance criterion | Result (Pass/Fail) |
|--------------------------------------------------------------------------|--------------|---------------|------------|------------------|--------------------------------|--------------------|
| <input checked="" type="checkbox"/> AC input power ports (Line to line)  | 1            | 1.2/50 (8/20) | Pos./ Neg. | A                | B                              | Pass               |
| <input checked="" type="checkbox"/> AC input power ports (Line to earth) | 2            | 1.2/50 (8/20) | Pos./ Neg. | A                | B                              | Pass               |
| <input type="checkbox"/> AC output power ports (Line to line)            | 1            | 1.2/50 (8/20) | Pos./ Neg. | N/A              | B                              | N/A                |
| <input type="checkbox"/> AC output power ports (Line to earth)           | 2            | 1.2/50 (8/20) | Pos./ Neg. | N/A              | B                              | N/A                |
| <input type="checkbox"/> DC port (Line to line)                          | 0.5, 1       | 1.2/50 (8/20) | Pos./ Neg. | N/A              | B                              | N/A                |
| <input type="checkbox"/> DC port (Line to earth)                         | 0.5, 1, 2    | 1.2/50 (8/20) | Pos./ Neg. | N/A              | B                              | N/A                |
| <input type="checkbox"/> Network Ports                                   | 0.5, 1       | 1.2/50 (8/20) | Pos./ Neg. | N/A              | B                              | N/A                |

## 13. INJECTED CURRENTS SUSCEPTIBILITY TEST

### 13.1. Test Specification

|                       |                          |
|-----------------------|--------------------------|
| Test Standard         | : EN IEC 62040-2         |
| Basic Standard        | : IEC 61000-4-6          |
| Performance criterion | : A                      |
| Test level            | : 10V                    |
| Frequency Range       | : 0.15M-80MHz            |
| Modulation            | : AM 80%, 1kHz sine-wave |
| Frequency Step        | : 1% of fundamental      |

### 13.2. Block Diagram of Test Setup



### 13.3. Test Procedure

- The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
- The EUT is placed on a 0.1m high test table, and a well grounded cable is connected to metallic plane above the test table.
- All cables/wires must be laid out on test plate (3cm in thickness), and the EUT is set up on test plate (10 cm in thickness) as shown in test setup photo, and the cables/wires must not be in mid-air, they should be touching the surface of test plate. Ensure that the EUT is properly connected to the accessory equipment.
- The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
- The frequency range is swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
- The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
- Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility
- Testing shall be performed according to a Test Plan, which shall be included in the test report.

#### 13.4. Test results

##### PASS

Temperature : 24.7°C  
Humidity : 52%  
Atmospheric Pressure : 101kpa  
Test Engineer : YJ  
Test Date : 2022-08-18

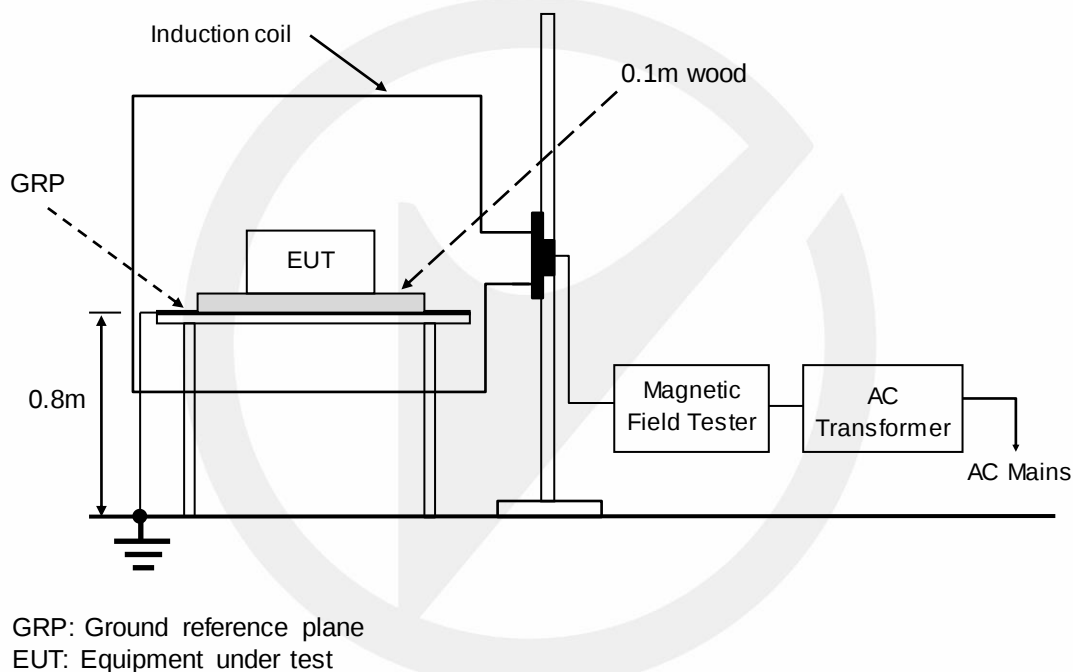
| Range (MHz) | Levers | Injection port                                                                                                                                                                                     | Coupling type                                                                                                                                                       | Actual criterion | Required performance criterion | Result (Pass/Fail) |
|-------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------|--------------------|
| 0.15-80     | 10V    | <input checked="" type="checkbox"/> AC input power ports<br><input checked="" type="checkbox"/> AC output power ports<br><input type="checkbox"/> DC port<br><input type="checkbox"/> Network port | <input checked="" type="checkbox"/> CDN<br><input type="checkbox"/> EM Clamp<br><input type="checkbox"/> Current Clamp<br><input type="checkbox"/> Direct injection | A                | A                              | Pass               |
| 0.15-80     | 3V     | <input type="checkbox"/> AC input power ports<br><input type="checkbox"/> AC output power ports<br><input type="checkbox"/> DC port<br><input type="checkbox"/> Network port                       | <input type="checkbox"/> CDN<br><input type="checkbox"/> EM Clamp<br><input type="checkbox"/> Current Clamp<br><input type="checkbox"/> Direct injection            | N/A              | A                              | N/A                |

## 14. MAGNETIC FIELD SUSCEPTIBILITY TEST

### 14.1. Test Specification

|                       |                  |
|-----------------------|------------------|
| Test Standard         | : EN IEC 62040-2 |
| Basic Standard        | : IEC 61000-4-8  |
| Performance criterion | : A              |
| Test level            | : 30A/m          |

### 14.2. Block Diagram of Test Setup



### 14.3. Test Procedure

The EUT is placed in the middle of a induction coil (1\*1m), under which is a 1\*1\*0.1m (high) wood, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

#### 14.4. Test Results

##### PASS

Temperature : 24.7°C  
Humidity : 52%  
Atmospheric Pressure : 101kpa  
Test Engineer : YJ  
Test Date : 2022-08-18

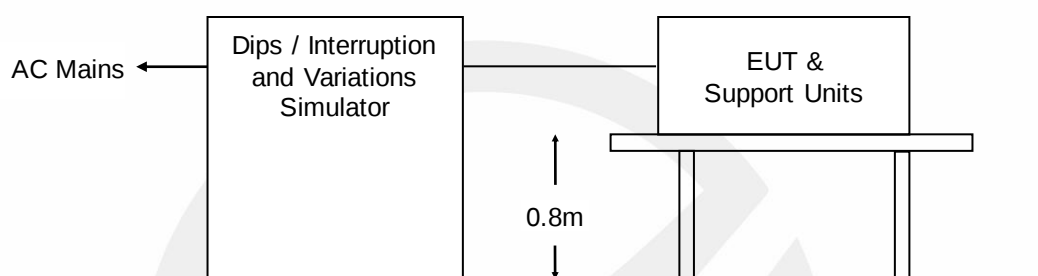
| Test Level<br>(A/m) | Frequency                                | Testing<br>Duration | Coil<br>Orientation                                                                                                                    | Actual<br>criterion | Required<br>performance<br>criterion | Result<br>(Pass/Fail) |
|---------------------|------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------------------|-----------------------|
| 30                  | <input checked="" type="checkbox"/> 50Hz | 5 mins              | <input checked="" type="checkbox"/> x-axis<br><input checked="" type="checkbox"/> y-axis<br><input checked="" type="checkbox"/> z-axis | A                   | A                                    | Pass                  |

## 15. VOLTAGE DIPS AND INTERRUPTIONS TEST

### 15.1. Test Specification

Test Standard : EN IEC 62040-2  
Basic Standard : IEC 61000-4-11

### 15.2. Block Diagram of Test Setup



### 15.3. Test Procedure

- a. Where the equipment has a rated voltage the following shall apply - If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range, a single voltage within that range may be specified as a basis for test level specification.
  - In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.
- b. Test Conditions
  - Select operated voltage and frequency of EUT - Test of interval : 10 sec.
  - Level and duration : Sequence of 3 dips/interrupts.
  - Voltage rise (and fall) time : 1.5  $\mu$ s.

#### 15.4. Test results

##### PASS

Temperature : 24.7°C  
 Humidity : 52%  
 Atmospheric Pressure : 101kpa  
 Test Engineer : YJ  
 Test Date : 2022-08-18

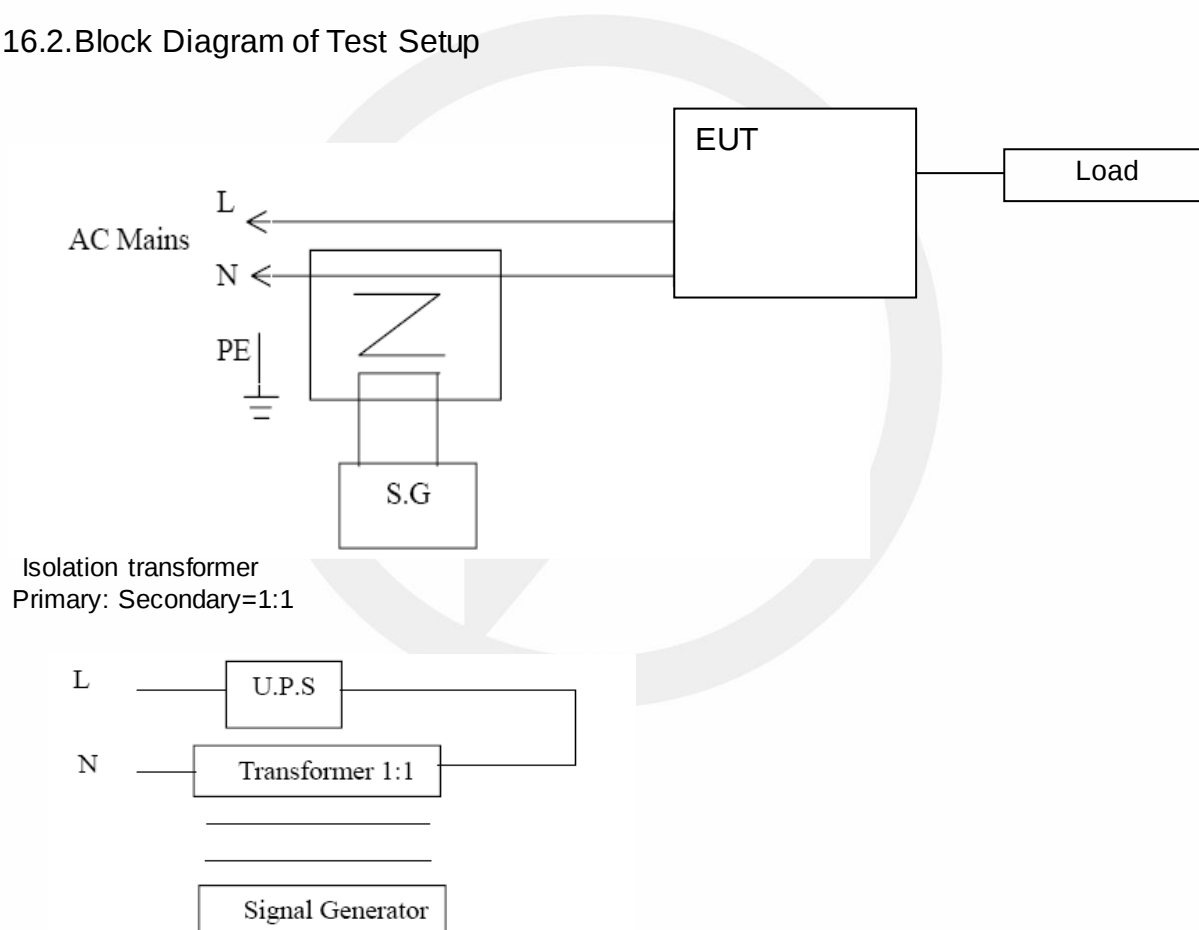
|                                                                                                                                               | Test Level<br>(% UT) | Phase angle<br>(°) | Reduction<br>(%) | Duration<br>(periods) | Actual<br>criterion | Required<br>performance<br>criterion | Result<br>(Pass/Fail) |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|-----------------------|---------------------|--------------------------------------|-----------------------|
| Voltage<br>Dips                                                                                                                               | 0%                   | 0°, 180°           | 100%             | 0.5                   | A                   | B                                    | Pass                  |
|                                                                                                                                               | 70%                  | 0°, 180°           | 30%              | 25                    | A                   | C                                    | Pass                  |
| Voltage<br>Interruption                                                                                                                       | 0%                   | 0°, 180°           | 100%             | 250                   | B                   | C                                    | Pass                  |
| Note: When the sample drops to 0% and 250P, the working mode of the sample changes and the test ends, It can automatically recover to normal. |                      |                    |                  |                       |                     |                                      |                       |

## 16. LOW FREQUENCY SIGNALS TEST

### 16.1. Test Specification

|                       |                      |
|-----------------------|----------------------|
| Test Standard         | : EN IEC 62040-2     |
| Basic Standard        | : IEC 61000-2-2      |
| Performance criterion | : A                  |
| Test frequency        | : 140-360Hz          |
| Test level            | : 10V(rms)Sinusoidal |

### 16.2. Block Diagram of Test Setup



### 16.3. Test Procedure

- 1) Set up the EUT and test generator as shown on Block diagram.
- 2) Add the 10V (rms) Sinusoidal interference signal and the interference signal frequency from 140Hz ~ 360Hz to L terminal.
- 3) Repeat the second step at the N-terminus.

## 16.4. Test Results

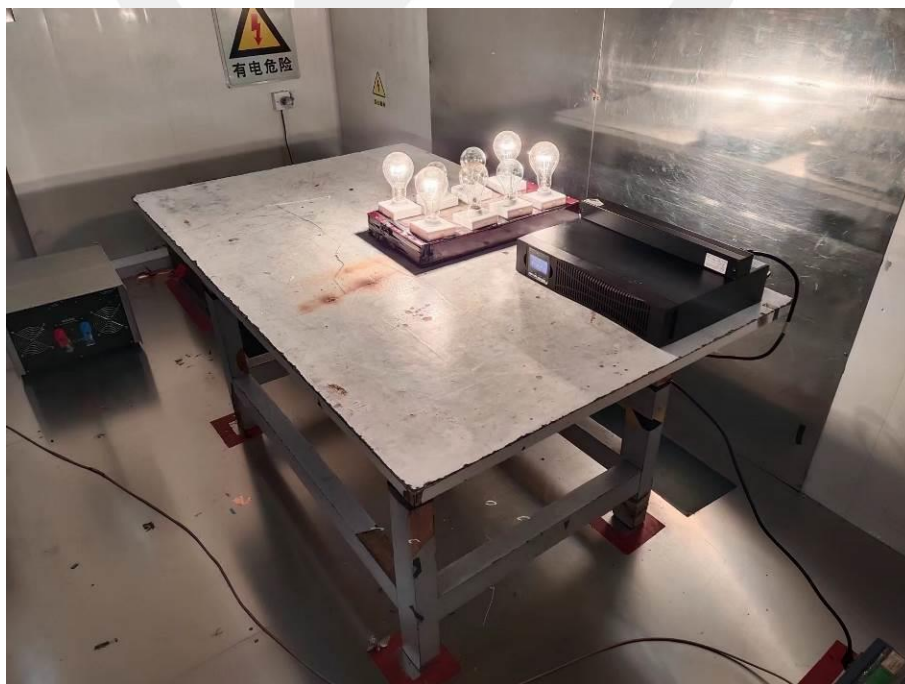
**PASS.**

Temperature : 24.7°C  
Humidity : 52%  
Atmospheric Pressure : 101kpa  
Test Engineer : YJ  
Test Date : 2022-08-18

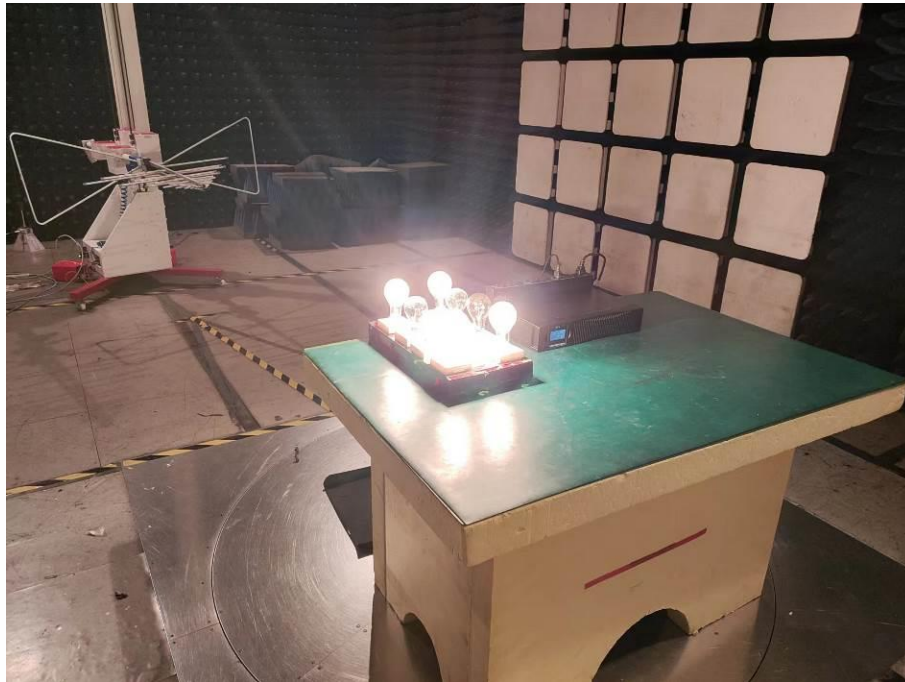
| Frequency Range (Hz) | Step (Hz) | Position | Strength               | Result | Note |
|----------------------|-----------|----------|------------------------|--------|------|
| 140                  | 10        | L,N      | 10V(rms)<br>Sinusoidal | Pass   | A    |
| 160                  |           |          |                        | Pass   | A    |
| 200                  |           |          |                        | Pass   | A    |
| 240                  |           |          |                        | Pass   | A    |
| 280                  |           |          |                        | Pass   | A    |
| 320                  |           |          |                        | Pass   | A    |
| 360                  |           |          |                        | Pass   | A    |

## 17.PHOTOGRAPHS

### 17.1.Photo of Conducted Emissions



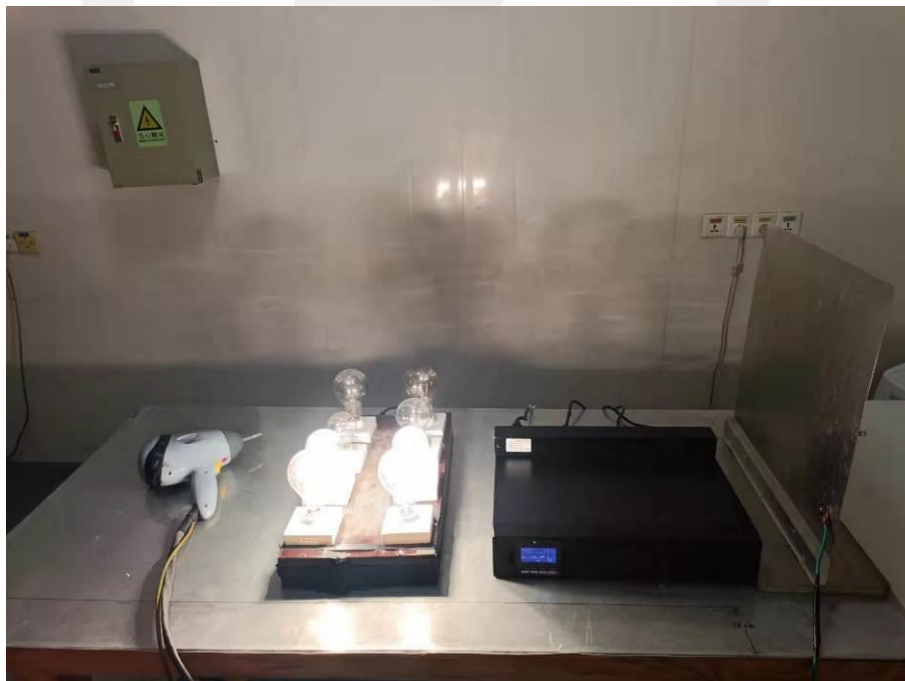
## 17.2.Photo of Radiation Emission Measurement



### 17.3.Photo of Harmonic / Flick Measurement



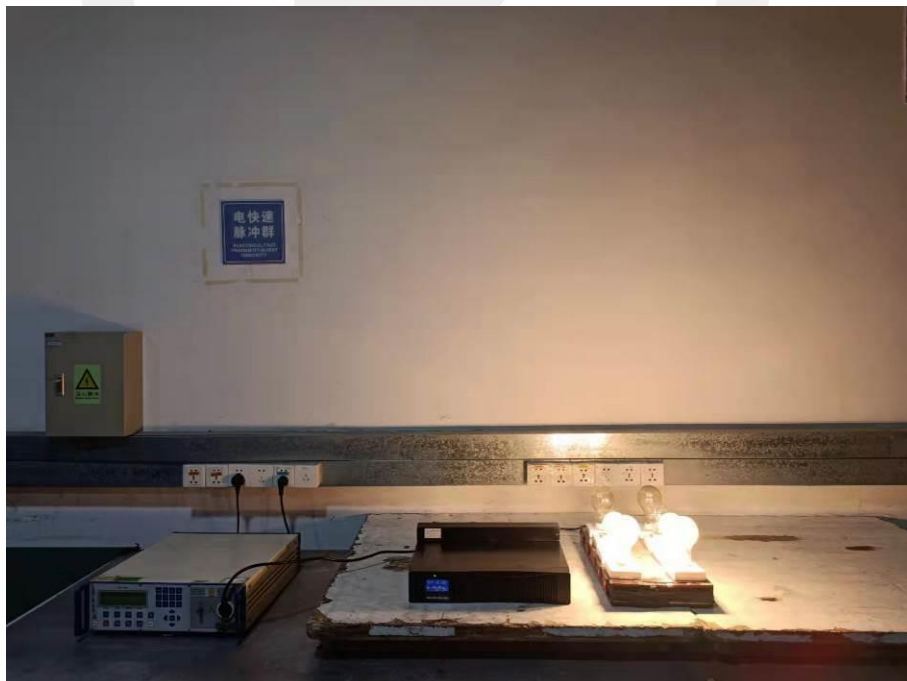
### 17.4.Photo of Electrostatic Discharge Test



#### 17.5.Photo of RF Field Strength Susceptibility Test



#### 17.6.Photo of Electrical Fast Transient / Burst Test



### 17.7.Photo of Surge Test



### 17.8.Photo of Injected Currents Susceptibility Test



17.9.Photo of Magnetic Field Susceptibility Test



17.10.Photo of Voltage Dips and Interruption Immunity Test

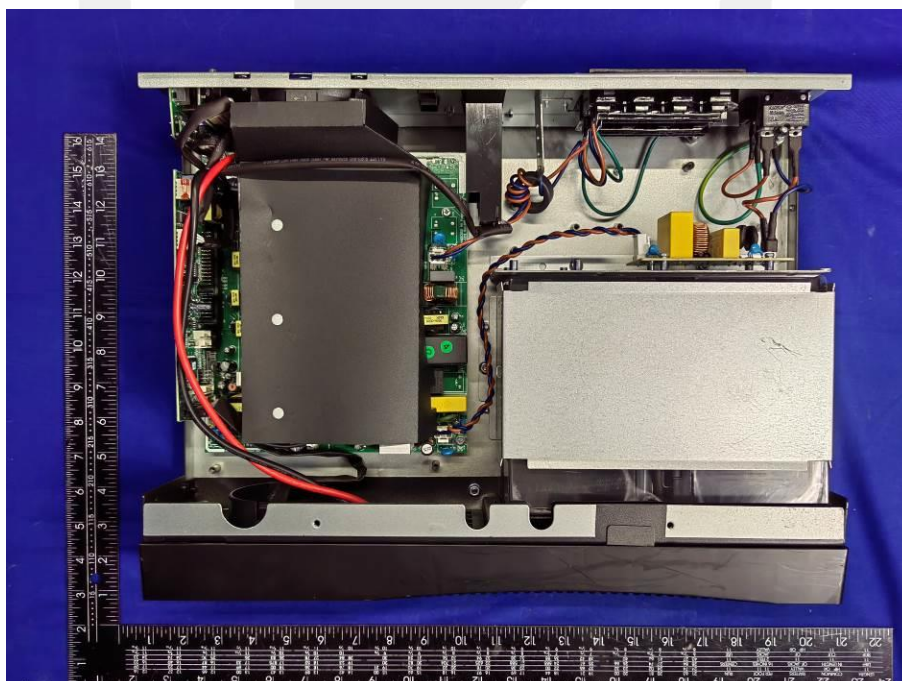


### 17.11.Photo of Low Frequency Signals Test



## APPENDIX A (Photos of EUT)







\*\*\*End of Report\*\*\*

## Statement

- 1 . This report is invalid without the signature of the authorized approver and "special seal for testing".
- 2 . This report shall not be copied partly without authorization.
- 3 . The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.
- 4 . The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
- 5 . The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.
- 6 . Objections shall be raised within 20 days from the date receiving the report.