



EMC Test Report for Vox Power Ltd

Report Reference: 13E4772-2

Vox Power Product: Nevo+1200S & Nevo+1200M

JANUARY 2017

COMPLIANCE ENGINEERING IRELAND LTD.

| | |
|---|--|
| Client: VOX Power, Vox Power Ltd Unit 2 Red Cow interchange estate Ballymount Dublin 22 <u>Attention: Mr. Brian McDonald</u> | Test of: NEVO+1200ML & NEVO+1200M NEVO+1200SL & NEVO+1200S, Modular Power supply system To: EN 55011: 2009 + A1: 2010 EN 60601-1-2: 2007 (3 rd Edition) EN 60601-1-2: 2014 (4 th Edition) EN 61000-6-2: 2005 EN 61000-3-2: 2014 EN 61000-3-3: 2013 |
|---|--|

COPIES TO: Files

REPORT REF: 13E4772-2

TESTED BY: G Monahan / L Brien

DATE RECEIVED: November 2013


REPORT BY: G Monahan

ISSUE DATE: January 2017

APPROVED SIGNATORY: J McAuley

JOB TITLE: Technical Manager

SIGNATURE:



Compliance Engineering Ireland Ltd Terms and Conditions

1. All quotations are submitted, orders are accepted and services supplied by Compliance Engineering Ireland Limited ("CEIL") subject to and upon the following express Terms and Conditions and all other Conditions, warranties and representations express or implied and statutory or otherwise are hereby excluded insofar as it is lawful to do so. No addition thereto or variation therefrom, contained or referred to in the Customers order form or otherwise effected shall apply unless specifically agreed in writing by a duly Authorised Officer of CEIL.
2. All orders including any based on a quotation previously submitted by CEIL are subject to acceptance in writing by CEIL.
- 3.(a) The prices set out in any quotation are based upon current costs and if there is any variation in the said costs between the date of the order or Contract and delivery of the final report CEIL shall be entitled to adjust prices to reflect such variations.
 - b) In the event of any suspension or variation of work arising from the Customer's instructions or lack of instructions the price set out in any quotation may be increased to cover any extra expense incurred by CEIL.
 - c) All prices quoted are strictly NET. The customer shall where applicable, in addition to the relevant price, pay a sum equal to the VAT chargeable in respect of the supply of services.
 - d) Accounts must be paid in full in advance or by way of an irrevocable letter of credit opened with a Bank approved by CEIL unless credit terms have been agreed by CEIL in which event accounts must be paid in full within 1 month from the date of the invoice. Time for payment is of the essence and the customer shall be liable to pay any outstanding amount from its due date until the date of payment at a rate of 2% per month or part thereof.
4. Any times quoted for the performance of services are to be treated as estimates only. CEIL shall not be liable in any manner whatsoever for failure to perform services within the time quoted, nor in such circumstances shall the Customer be entitled to cancel or terminate any order or contract.
5. The Customer is responsible for delivery to CEIL of test item(s) free of any duty, VAT, freight charges etc. unless otherwise agreed in writing by CEIL.
6. The Customer shall be responsible for collecting non-perishable samples received for testing or laboratory work upon completion of tests or laboratory work. If the Customer fails to collect such samples within 90 days from completion of the tests or laboratory work CEIL shall be entitled without further notice to dispose of the samples without liability.
7. No action or legal proceedings shall be taken (except in the case of wilful neglect or default) against CEIL by reason of or arising out of any research, investigation, test or analyses or the publication of the results thereof in the name of CEIL. Under no circumstances shall CEIL be liable to the Customer for any indirect, incidental, special or consequential damages of any nature whatsoever (including but not limited to loss of use, revenue, profit, data or business opportunity) either based upon a claim or action in Contract or in Tort, indemnity or contribution, or otherwise arising out of the Contract or performance of services by CEIL even if CEIL has been advised of the possibility of such damages. The limit of CEIL's aggregate liability (whether in Contract, Tort, strict liability in Tort or by statute or otherwise) to the Customer or to any third party for non-performance by CEIL and for any and all other claims shall not in the aggregate exceed the fees paid by the Customer to CEIL. The Customer shall indemnify CEIL against all claims made against CEIL by any third party arising from this Contract.
8. The copyright of any report is reserved to CEIL and it shall not be used either in whole or in part, for the purposes of advertising, publicity, litigation or otherwise without the prior written consent of a duly Authorised Officer of CEIL where such consent is given the Customer shall comply with any conditions attaching to the consent. In conformance with laboratory accreditation requirements reports shall only be produced in full. The test results tabulated shall relate only to the defined item(s) tested.
9. If in CEIL's judgment, the customer's financial condition is such as could adversely affect the customers' ability to perform any of its obligations or if the customer is in default in any of its obligations to CEIL whether hereunder or under any other Contract CEIL may terminate this Contract and/ or any other Contract between CEIL and the Customer, cancel any uncompleted order or suspend performance of services or the delivery of any reports and if it does so the Customer shall indemnify CEIL against all costs, charges, expense and damages incurred thereby.
10. CEIL will not be liable for non-performance in whole or in part of its obligations if this is attributable to any cause beyond the control of CEIL including (without limitation) any act of god, force majeure, war, civil war, disturbance, rebellion, embargo, strike, labour dispute, illness, flood, fire, sabotage or government action or regulation. If a Contract or order or any part thereof shall become impossible of performance or otherwise frustrated CEIL shall be entitled to reasonable remuneration for any work done up to the date of such impossibility or frustration, due credit being given for any amounts in respect of the Contract or order paid by the Customer.
11. CEI agrees to keep confidential all matters relating to this contract. This includes but is not limited to products tested, methods used, results of the work and contents of any reports.
12. These Conditions and the Contract to which the document relates shall in all respects be governed by and construed in accordance with the laws of the Republic of Ireland and in accordance with the Republic of Ireland shall have exclusive jurisdiction to determine any disputes arising therefrom unless otherwise agreed.
13. CEI is an accredited test laboratory and relevant test reports are denoted by use of the accreditation logo. When the accreditation logo is not used, the report is outside our scope accreditation.

Executive Summary

The equipment under test fulfils the standards listed below

| Standard | Test result |
|---|-------------|
| EN 60601-1-2: 2014 (4 th Edition) Title: Medical Electrical Equipment Section 1.2: Collateral standard: Electromagnetic Compatibility – Requirements and tests. | Pass |
| EN 61000-6-3: 2007 Title: Generic Standard Section 6.3: Emission Standard for residential, commercial and light industrial environments. | Pass |
| EN 61000-6-2: 2005 Title: Generic Standard Section 6.2: Immunity for industrial Environments | Pass |
| EN 61000-6-1:2007 Generic Standard Immunity for residential, commercial and light-industrial environments | Pass |

Declaration of conformity

The intention of these tests is such that the following statement can be added to the Declaration of Conformity i.e. DoC

The NEVO+1200 S/SL/M/ML products comply with the EMC directive 2014/30/EU, EMC directive.

Conformity was demonstrated by testing to and passing the limits set in the following standards.

EN55011:2009 +A1:2010 Class B
EN61000-3-2:2014
EN61000-3-3:2013
EN60601-1-2:2007 (3RD Edition)
EN60601-1-2:2014 (4TH Edition)

| Guidance and manufacturer's declaration – electromagnetic emissions | | |
|--|-------------------|--|
| The Device is intended for use in the electromagnetic environment specified below. The customer or the user of the Device should assure that it is used in such an environment | | |
| Emissions test | Compliance | |
| RF Emissions CISPR 11 EN 55011: 2009 + A1: 2010 | Group 1 | The Device must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected. |
| RF Emissions CISPR 11 EN 55011: 2009 + A1: 2010 | Class B | Class B equipment is equipment suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes. In the documentation for the user, a statement shall be included drawing attention to the fact that there may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances. |
| Harmonic emissions IEC 61000-3-2 EN 61000-3-2: 2014 | Class A | |
| Voltage fluctuations / flicker emissions IEC 61000-3-3 EN 61000-3-3: 2013 | All Parameters | |

Table 201 – Guidance and manufacturer's declaration – electromagnetic emissions – for all equipment and systems


| Guidance and manufacturer's declaration – electromagnetic immunity | | | |
|--|--|--|--|
| The Device is intended for use in the electromagnetic environment specified below. The customer or the user of the Device should assure that it is used in such an environment | | | |
| Immunity test | IEC 60601 Test level | Compliance level | Electromagnetic environment - guidance |
| Electrostatic discharge (ESD) IEC 61000-4-2 EN 61000-4-2: 2009 | ±8 kV contact ±15 kV air | ±2, 4, 6 & 8 kV contact ±2, 4, 8 & 15 kV air | Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%. |
| Electrical fast transient/burst IEC 61000-4-4 EN 61000-4-4: 2012 | ±2kV for power supply lines ±1 kV for input/output lines | ±2kV for power supply lines ±1kV for input/output lines | Mains power quality should be that of a typical commercial or hospital environment |
| Surge IEC 61000-4-5 EN 61000-4-5: 2006 | ±1kV differential mode ±2 kV common mode | ±0.5 & 1kV differential mode ±0.5, 1 & 2 kV common mode | Mains power quality should be that of a typical commercial or hospital environment |
| Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11 EN 61000-4-11: 2004 | <5 % Ut (>95 % dip in Ut) for 0.5 cycle @ 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° 70 % Ut (30 % dip in Ut) for 25 cycles <5 % Ut (>95 % dip in Ut) for 5 sec <5 % Ut (>95 % dip in Ut) for 1 cycle 40 % Ut (>60 % dip in Ut) for 5 cycle | <5 % Ut (>95 % dip in Ut) for 0.5 cycle @ 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° 70 % Ut (30 % dip in Ut) for 25 cycles <5 % Ut (>95 % dip in Ut) for 5 sec <5 % Ut (>95 % dip in Ut) for 1 cycle 40 % Ut (>60 % dip in Ut) for 5 cycle | Mains power quality should be that of a typical commercial or hospital environment. If the user of the Device requires continued operation during power mains operation, it is recommended that the Device must be powered from an uninterruptible power supply or battery |
| Power frequency (50/60 Hz) magnetic field IEC 61000-4-8 EN 61000-4-8: 2010 | 30 A/m | 30 A/m | Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment |
| Note: Ut is the a.c.mains voltage prior to application of the test level | | | |

Table 202 – Guidance and manufacturer's declaration – electromagnetic immunity – for all

equipment and systems

Guidance and manufacturer's declaration – electromagnetic immunity

The Device is intended for use in the electromagnetic environment specified below. The customer or the user of the Device should assure that it is used in such an environment

| Immunity test | IEC 60601 test level | Compliance level | Electromagnetic environment - guidance |
|--|--|--|---|
| <p>Conducted RF</p> <p>IEC 61000-4-6 EN 61000-4-6: 2014</p> | <p>3 Vrms outside industrial, scientific and medical (ISM) and amateur radio bands. 6 Vrms in ISM and amateur radio bands</p> <p>150 kHz to 80 MHz</p> | <p>6 Vrms</p> <p>150 kHz to 80 MHz</p> | <p>Portable and mobile RF communications equipment should be used no closer to any part of the PB840 Ventilator, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance</p> <p>$d = [1.17]\sqrt{P}$</p> |
| <p>Radiated RF</p> <p>IEC 61000-4-3 EN 61000-4-3: 2006 + A1: 2008 + A2: 2010</p> | <p>10 V/m</p> <p>80 MHz to 2.7 GHz</p> <p>27 V/m, 18 Hz PM 385 MHz</p> <p>28 V/m, 50 %18 Hz PM 450 MHz</p> <p>9 V/m, 217 Hz PM 710 MHz</p> <p>9 V/m, 217 Hz PM 745 MHz</p> <p>9 V/m, 217 Hz PM 780 MHz</p> <p>28V/m, 18 Hz PM 810 MHz</p> <p>28 V/m, 18 Hz PM 870 MHz</p> <p>28 V/m, 18 Hz PM 930 MHz</p> <p>28V/m, 217 Hz PM 1720 MHz</p> <p>28 V/m, 217 Hz PM 1845 MHz</p> | <p>10 V/m</p> <p>80 MHz to 2.7 GHz</p> <p>27 V/m, 18 Hz PM 385 MHz</p> <p>28 V/m, 50 %18 Hz PM 450 MHz</p> <p>9 V/m, 217 Hz PM 710 MHz</p> <p>9 V/m, 217 Hz PM 745 MHz</p> <p>9 V/m, 217 Hz PM 780 MHz</p> <p>28V/m, 18 Hz PM 810 MHz</p> <p>28 V/m, 18 Hz PM 870 MHz</p> <p>28 V/m, 18 Hz PM 930 MHz</p> <p>28V/m, 217 Hz PM 1720 MHz</p> <p>28 V/m, 217 Hz PM 1845 MHz</p> | <p>$d = [1.17]\sqrt{P} \dots 80\text{MHz to } 800 \text{ MHz}$</p> <p>$d = [2.33]\sqrt{P} \dots 800 \text{ MHz to } 2.5\text{GHz}$</p> <p>Where P is the maximum output power rating of the transmitter in Watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m)</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, ^a should be less than the compliance level in each frequency range. ^b</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol</p>  |

| | | | |
|---|--|-------------------------------|--|
| | 28 V/m, 217 Hz PM 1970 MHz | 28 V/m, 217 Hz PM 1970 MHz | |
| | 27 V/m, 217 Hz PM 2450 MHz | 27 V/m, 217 Hz PM 2450 MHz | |
| | 9V/m, 217 Hz PM 5240 MHz | 9V/m, 217 Hz PM 5240 MHz | |
| | 9 V/m, 217 Hz PM 5500 MHz | 9 V/m, 217 Hz PM 5500 MHz | |
| | 9 V/m, 217 Hz PM 5785 MHz | 9 V/m, 217 Hz PM 5785 MHz | |
| Note 1: At 80 MHz and 800 MHz, the higher frequency range applies | | | |
| Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. | | | |
| a | Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the PB840 Ventilator is used exceeds the applicable RF compliance level above, the PB840 Ventilator should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orientating or relocating the PB840 Ventilator. | | |
| b | Over the frequency range 150 kHz to 80 MHz, field strengths should be less than $[V_1]V/m$ | | |

Table 204 – Guidance and manufacturer’s declaration – electromagnetic immunity – for equipment and systems that are not life-supporting

| Recommended separation distances between portable and mobile RF communication equipment and the PB840 Ventilator | | | |
|--|--|--------------------------|--------------------------|
| The Device is intended for use in an electromagnetic environment specified in Table 201. The customer or the user of the Device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Device as recommended below, according to the maximum output power of the communications equipment. | | | |
| Rated maximum output power of transmitter W | Separation distance according to frequency of transmitter m | | |
| | 150 kHz to 80 MHz | 80 MHz to 800 MHz | 800 MHz to 2.5GHz |
| | $d = [1.17]\sqrt{P}$ | $d = [1.17]\sqrt{P}$ | $d = [2.33]\sqrt{P}$ |
| 0.01 | 0.12 | 0.12 | 0.23 |
| 0.1 | 0.37 | 0.37 | 0.75 |
| 1 | 1.17 | 1.17 | 2.33 |
| 10 | 3.70 | 3.70 | 7.36 |
| 100 | 11.70 | 11.70 | 23.30 |
| For transmitters rated at a maximum output power not listed above, the recommended separation distance <i>d</i> in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where <i>P</i> is the maximum output power rating of the transmitter in watts (w) according to the transmitter manufacturer. | | | |
| NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. | | | |
| NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. | | | |

Table 206 – Recommended separation distances between portable and mobile RF communications equipment and the equipment and system – for equipment and systems that are not life supporting

Table of Contents

Section 1: Equipment under Test (E.U.T.)

Section 2: Test Specification, Methods and Procedures

Section 3: Deviations and Exclusions from the Test Specifications

Section 4: Operation of E.U.T. During Testing

Section 5: Results

Section 6: Analysis of Test Results, Conclusions

Appendix 1: Test Equipment Used

Appendix 2: Test Configuration

Appendix 3: Results

1 Equipment under Test (E.U.T.)

1.1 Identification of E.U.T.

| | |
|-------------------------|----------------------------------|
| Brand Name: | Nevo + 1200S/SL, Nevo + 1200M/ML |
| Description: | 1200W Configurable Modular PSU |
| Model Number: | 1200 S, 1200M |
| Serial Number: | 1340A003 |
| Cables: | Mains Cable |
| Country of Manufacture: | Ireland |

1.2 Description of E.U.T.

The EUT mains powered 1200 watt modular configurable PSU.

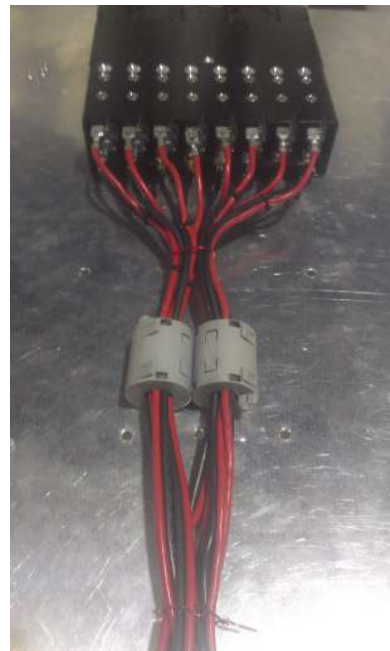
1.3 Modifications incorporated in E.U.T.

A ferrite (TDK - ZCAT2032-0930) was fitted to the input mains cable to comply with EN55022 Radiated emissions Class B

Two ferrites (TDK - ZCAT3035-1330) were fitted to the output mains cable to comply with EN55022 Radiated emissions Class B



Input Cable Ferrite



Output Cable Ferrite

1.4 Support Equipment List

No Support Equipment was required.

1.5 Date of Test

The tests were carried during the months of August and October 2013.

Additional testing required to meet EN 60601-1-2: 2014 (4th Edition) was carried out between the 5th and 8th of December 2016.

2 Test Specification, Methods and Procedures

2.1 Emissions

Emissions were assessed to the following standards:

EN 55011: Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement.

EN 61000-3-2: Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

EN 61000-3-3: Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

2.2 Immunity

Immunity was assessed according to the following standards:

EN 61000-6-1: Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments

| | |
|---------------|---|
| EN 61000-4-2 | Electromagnetic Compatibility (EMC) Part4: Testing and measurement techniques Section2: Electrostatic discharge immunity test |
| EN 61000-4-3 | Electromagnetic Compatibility (EMC) Part4: Testing and measurement techniques Section3: Radiated, radio-frequency, electromagnetic field immunity test |
| EN 61000-4-4 | Electromagnetic Compatibility (EMC) Part4: Testing and measurement techniques Section4: Electrical fast transient/burst immunity test |
| EN 61000-4-5 | Electromagnetic compatibility (EMC) Part 4. Testing and measurement techniques. Section 5: Surge immunity test. |
| EN 61000-4-6 | Electromagnetic compatibility (EMC) Part 4. Testing and measurement techniques. Section 6: Immunity to Conducted disturbances, induced by Radio-frequency fields. |
| EN 61000-4-8 | Electromagnetic Compatibility (EMC) Part4: Testing and measurement techniques Section4: Power frequency magnetic field immunity test |
| EN 61000-4-11 | Electromagnetic compatibility (EMC) Part 4. Testing and measurement techniques. Section 11: Voltage dips, short interruptions and voltage variations immunity test. |

2.3 Apparatus and Methods:

Measuring apparatus used during tests was designed and built to the requirements of:
C.I.S.P.R. 16

3. Deviations and Exclusions from the Test Specifications

3.1 Deviations

Up to date versions of the basic standards have been used in this test programme. Where necessary, we have verified that the requirements of any older basic standards as may be referred to in the product standard have been complied with.

3.2 Exclusions

There were no exclusions from the test specification.

4. Operation of E.U.T. During Testing

4.1 Operating Environment

Supply Voltage: 230 Vac, 50 Hz for all tests and repeated at 120 Vac for EN 61000-4-11.

The following were the conditions at the time of immunity testing.

Temperature: 19-20 °C
Humidity: 54-56% RH

4.2 Operating Modes:

The E.U.T was connected to a bank of power resistors which loaded with DC output with 1 ohm.

The maximum clocking source in the EUT was 260 kHz

4.3 Compliance Criteria:

For radiated and conducted emissions, compliance was determined by comparing the measured results to the appropriate limits.

For immunity testing, compliance was determined by monitoring the output LED's and voltage for any signs of disturbance.

4.4 Criteria for compliance during immunity test

4.4.1 Performance Criteria A

During testing, normal performance within the specification limits.

4.4.2 Performance Criteria B

After the test the EUT shall maintain normal operation with no degradation of performance or loss of function.

4.4.3 Performance Criteria C

After the test it shall be possible to restart the EUT and regain normal operation with no degradation of performance or loss of function.

5 Results

5.1 Conducted Emissions

Voltage & Frequency: 230V 50Hz

Measurements of conducted emissions were carried out using the receiver analysis feature, which uses three detectors, peak, quasi peak and average. Using this mode, the voltage emission spectrum could be scanned in peak detection mode and emissions, which exceeded a sub range margin relevant to the respective limits, could be further measured. The receiver bandwidth was set to 10 kHz.

Appendix 3 illustrate the results. The test configuration is shown in Appendix 2.

5.1.1 Measurement Uncertainty

The measurement uncertainty (with a 95% confidence level) for the conducted emissions test was ± 3.5 dB.

5.2 Radiated Emissions

Compliant measurements of radiated emissions were carried out in an Anechoic Chamber from 30 MHz to 1 GHz. The equipment and cable orientation were investigated to ensure that maximum emissions were obtained at critical frequencies. The antenna height was also adjusted through the range of 1m - 4m.

The receiver bandwidth was set to 120 kHz for frequencies between 30 MHz and 1 GHz. See Appendix 3 for results.

5.2.1 Measurement Uncertainty

The measurement uncertainty (with a 95% confidence level) for the radiated emissions test was ± 5.3 dB (from 30 to 100 MHz), ± 4.7 dB (from 100 to 300 MHz) and ± 3.9 dB (from 300 to 1000 MHz)

5.3 Immunity to Radiated, Radio Frequency Electromagnetic Fields

a) Radiated RF EM fields

| | |
|------------------|----------------------------------|
| Port: | Enclosure |
| Basic Standard: | EN 61000-4-3 |
| Limit: | 10 V/m (80% AM 1 kHz modulation) |
| Frequency range: | 80-2700 MHz |
| Dwell time: | 3 second dwell |

The EUT was placed in the anechoic chamber.

The step sizes from 80-2700MHz were in 1% steps. The dwell time at each frequency was 3 seconds. The test level was maintained at over 10 V/m at all frequencies in accordance with EN 60601-1-2.

The distance of the antenna from the EUT was 2.2 metres. The tests were carried out with the antenna oriented in horizontal and vertical polarisations for each side of the EUT.

The EUT was deemed to comply in accordance with the manufacturer's specification.

Radiated Immunity Tests

| Frequency MHz | Modulation Frequency | Polarisation (V/H) | Level (V/m) | Result |
|---------------|----------------------|--------------------|-------------|----------|
| 80-2700 MHz | 1 kHz | V and H | 10 | Complied |

b) Proximity fields from RF wireless communications equipment

Port: Enclosure
Dwell time: 3 second dwell

The EUT was placed in the anechoic chamber.

The testing was carried out on the spot frequencies as listed below. The dwell time at each frequency was at least 3 seconds.

A field sensor was placed in close proximity to the system. The tests were carried out with the antenna oriented in horizontal and vertical polarisations for each side of the EUT.

The EUT was deemed to comply with Performance Criteria A when tested in accordance with the manufacturer's specification.

Radiated Immunity Tests

| Frequency MHz | Modulation Frequency | Polarisation (V/H) | Level (V/m) | Result |
|----------------------|-----------------------------|---------------------------|--------------------|---------------|
| 385 | 18 Hz Pulse Modulation | V and H | 27 | Complied |
| 450 | 50% 18 Hz Pulse Modulation | V and H | 28 | Complied |
| 710 | 217 Hz Pulse Modulation | V and H | 9 | Complied |
| 745 | 217 Hz Pulse Modulation | V and H | 9 | Complied |
| 780 | 217 Hz Pulse Modulation | V and H | 9 | Complied |
| 810 | 18 Hz Pulse Modulation | V and H | 28 | Complied |
| 870 | 18 Hz Pulse Modulation | V and H | 28 | Complied |
| 930 | 18 Hz Pulse Modulation | V and H | 28 | Complied |
| 1720 | 217 Hz Pulse Modulation | V and H | 28 | Complied |
| 1845 | 217 Hz Pulse Modulation | V and H | 28 | Complied |
| 1970 | 217 Hz Pulse Modulation | V and H | 28 | Complied |
| 2450 | 217 Hz Pulse Modulation | V and H | 28 | Complied |
| 5240 | 217 Hz Pulse Modulation | V and H | 9 | Complied |
| 5500 | 217 Hz Pulse Modulation | V and H | 9 | Complied |
| 5785 | 217 Hz Pulse Modulation | V and H | 9 | Complied |

5.4 Electrostatic Discharge Test

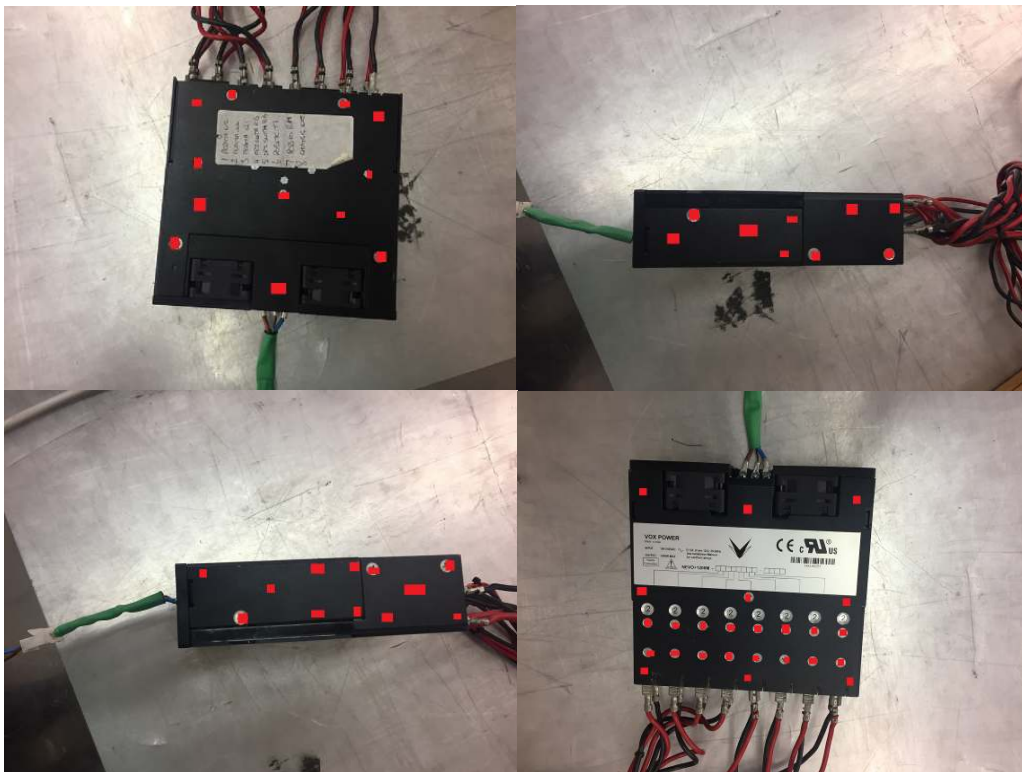
| | |
|-----------------|---|
| Port: | Enclosure |
| Basic Standard: | EN 61000-4-2 |
| Limit: | ± 2 , ± 4 & ± 8 kV contact discharges ± 2 , ± 4 , ± 8 & ± 15 kV air discharges |

The ESD generator contained a discharge capacitor of 150pF and resistor of 330 Ω in accordance with the requirements of EN 61000-4-2. The tests were carried out using both positive and negative discharges. Discharges were applied to the EUT to comply with EN 61000-4-2.

Only parts of the equipment that can be touched during normal operation were subjected to discharges.

Air discharges of ± 2 , ± 4 , ± 8 & ± 15 kV, were applied to different points on the enclosure. Contact discharges of ± 2 , ± 4 & ± 8 kV, were applied to conductive points on the enclosure, in addition to the horizontal and vertical coupling planes. 10 discharges of each polarity were applied at each location.

The EUT while powered complied with Performance Criteria A during and after the application of discharges. Discharges were applied to chassis screws and chassis only.



ESD Discharge Points

5.5 Conducted RF Immunity

Ports: AC mains.
 Basic Standard: EN 61000-4-6
 Performance Criterion: A
 Limit: 10V emf, 80% AM modulation
 Frequency range: 150 kHz to 80 MHz

The EUT was arranged according to the EN61000-4-6.

The test configuration is shown in Appendix 2.

The current was injected on the mains cable in common mode. Each surface of the EUT was more than 0.5m from other metal surfaces.

The test configuration used was the EM clamp injection method. The system was calibrated to provide a current input level equivalent to an injected voltage level of 10V emf into a 150-ohm system. The dwell time at each frequency was 3 seconds.

The E.U.T. was found to be operating satisfactorily during and subsequent to testing.

| Port | Disturbance type | Result |
|-------|---------------------------|----------|
| Mains | 10V emf, 150 kHz – 80 MHz | Complied |

Results of Conducted Immunity Testing

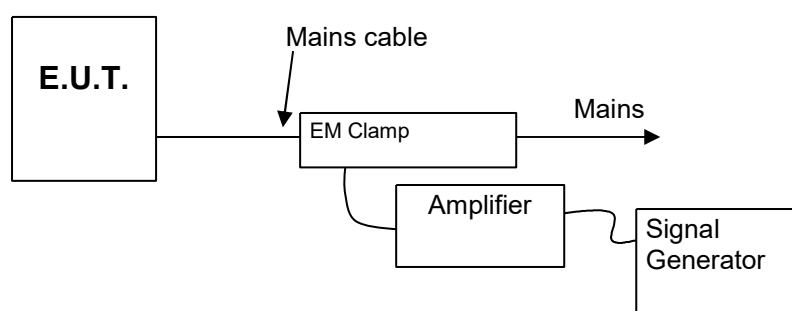


Figure 5: Conducted Immunity Test Set up

5.6 Electrical Fast Transient Test

Ports: AC mains
Basic Standard: EN 61000-4-4
Performance Criterion: A
Level: 4
Limit: $\pm 1, \pm 2$ & ± 4 kV mains power ports

Positive and negative fast transient discharges of amplitude $\pm 1, \pm 2$ & ± 4 kV were applied to the mains input in accordance with the requirements of EN 61000-4-4.

The test configuration is shown in Appendix 2.

The tests were carried out with negative and positive transients. The application time for each test was 1 minute.

The E.U.T. was found to be operating satisfactorily during and subsequent to testing.

| Test port | Level | Result |
|-----------|--------------------------|----------|
| Live | $\pm 1, \pm 2, \pm 4$ kV | Complied |
| Neutral | $\pm 1, \pm 2, \pm 4$ kV | Complied |
| L-N-E | $\pm 1, \pm 2, \pm 4$ kV | Complied |
| Earth | $\pm 1, \pm 2, \pm 4$ kV | Complied |

5.7 Surge Immunity Test

Ports: AC Mains
Basic Standard: EN 61000-4-5
Performance Criterion: A
Level: 3
Limit, Line to Earth: $\pm 0.5, \pm 1$ & ± 2 kV
Limit, Live to Neutral: ± 0.5 & ± 1 kV

Positive and negative surges were applied to each of the mains inputs in accordance with the requirements of EN 61000-4-5.

Surges were applied to the mains conductors coupled line to line and line to earth.

The test configuration is shown in Appendix 2.

The tests were carried out with positive and negative surges. The test was repeated every 60 seconds for a total of 5 times in each polarity and in all coupling modes. The tests were performed at 0°, 90°, 180° and 270° phases for both polarities.

The E.U.T. was found to be operating satisfactorily during and subsequent to testing.

Results of Surge Immunity Testing

| Port | Mode of conduction | Disturbance level | Result |
|------|--------------------|----------------------------|----------|
| PSU | L-E | $\pm 0.5, \pm 1, \pm 2$ kV | Complied |
| PSU | N-E | $\pm 0.5, \pm 1, \pm 2$ kV | Complied |
| PSU | L-N | $\pm 0.5, \pm 1$ kV | Complied |

5.8 Voltage Dips & Interruptions Test

Ports: AC Mains
Basic Standard: EN 61000-4-11
Dips: Mains port - > 95% dip 0.5 cycles
At 0°, 45°, 90°, 135°, 180°, 225°, 270° & 315°
Mains port - >95% dip 1 cycle
Mains port – 30% dip 25 cycles
Mains port – 60% dip 10 cycles

Interruption: Mains port – Interruption 250 cycles

Dips and interruptions were applied to the mains input in accordance with the requirements of EN 61000-4-11.

The test configuration is shown in Appendix 2.

The E.U.T. was checked after each test run to ensure correct operation.

The E.U.T. was found to be operating satisfactorily during and subsequent to testing.

Results of Voltage Dips and Interruptions Testing

| Port | Disturbance type | Result |
|-------------------------|--|---------------|
| Mains supply 240 Vac | >95% dip 0.5 cycles At 0°, 45°, 90°, 135°, 180°, 225°, 270° & 315° | Complied A |
| Mains supply 240 Vac | >95% dip 1 cycles | Complied A |
| Mains supply 240 Vac | 30% dip 25 cycles | Complied A |
| Mains supply 240 Vac | 60% dip 10 cycles | Complied A |
| Mains supply 240 Vac | >95% interruption 250 cycles | Complied C |

5.9 Power Frequency Magnetic Field Immunity Test

Basic Standard: EN 61000-4-8
Performance Criterion: A
Limit: 30 A/m

The unit was placed on a non-conductive table of 0.8-meter height from the ground plane.

The test configuration is shown in Appendix 2.

The current level was set to 30 A/m and the unit was centred in the middle of the loop. The EUT was tested with the loop in both horizontal and vertical positions for one minute. The test was carried out at 230 Vac.

The EUT maintained normal operation during and subsequent to testing.

5.10 Fluctuating Harmonics

Ports: AC mains
Basic Standard: EN 61000-3-2
Class: A

The test measures the current at each of the harmonic frequencies from the second harmonic up to the fortieth harmonic.

A 50 Hertz, 230 Volt AC source was used to power the unit in compliance with EN 61000-3-2. The current harmonic levels were measured and compared with the limit levels for Class A waveforms. See Appendix 3 for results.

The test configuration is shown in Appendix 2.

5.11 Flicker

Ports: AC mains
Basic Standard: EN 61000-3-3

The E.U.T. was connected to an impedance network and a 50 Hertz, 230 Volt AC source to power the unit in compliance with EN 61000-3-3.

The mains voltage flicker test was performed for 120 minutes. The E.U.T. flicker levels were significantly below the limit. See Appendix 3 for results.

The test configuration is shown in Appendix 2.

6 Analysis of Test Results, Conclusions

6.1 Measurement Uncertainties

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4 with a confidence level of 95%.

6.2 Radiated Emissions to EN 55011.

The E.U.T. complied with the radiated emission specification of EN 55011 class A by a margin of 6.4 dB at frequency 116.240 Mhz.

The E.U.T. complied with the radiated emission specification of EN 55011 class B with a ferrite fitted as outlined in Section 1.3 by a margin of 2.0 dB at frequency 229.652 Mhz.

6.3 Conducted Emissions to EN 55011.

The E.U.T. complied with the EN 55011 Class B conducted emission specification by a margin of greater than 1 dB (Ave detector)

6.4 Immunity.

The EUT complied with the immunity tests carried out to demonstrate compliance with EN 61000-6-2 & EN 60601-1-2 when tested in accordance with the manufacturers specifications.

6.5 Steady State and Fluctuating Harmonics

The E.U.T. complied with the tests carried out to demonstrate compliance with EN 61000-3-2.

6.6 Flicker

The E.U.T. complied with the tests carried out to demonstrate compliance with EN 61000-3-3.

Appendix 1

Test Equipment Used:

| Instrument | Mftr. | Model | Serial No. |
|----------------------|--------------------|--------------|-------------------|
| Measuring Receiver | Rohde and Schwarz | ESVS30 | 607 |
| Measuring Receiver | Rohde and Schwarz | ESHS30 | 605 |
| LISN | Rohde and Schwarz | ESH3-Z5 | 604 |
| Signal Generator | Rohde and Schwarz | SME 03 | 765 |
| Signal Generator | Rohde and Schwarz | SME 03 | 782 |
| Power Amplifier | Ophir | 5292FE | - |
| Anechoic Chamber | CEI | CEI | 845 |
| Power Amplifier | Schaffner | CBA9433 | - |
| Field Monitor System | Amplifier Research | FM2000 | 616 |
| Field Probe | Amplifier Research | FP2000 | 616 |
| Bilog Antenna | Schaffner | CBL6140 | - |
| Bilog Antenna | Schwarbeck | VULB9160 | 889 |
| Transient Simulator | EMC Partner | TEMA 4000 | 921 |
| Anechoic Chamber | CEI | - | 845 |
| Anechoic Chamber | CEI | - | 627 |
| N Type Cable | - | 615 | 615 |
| BNC Cable | - | 601 | 601 |
| EM Clamp | Schaffner | KEMZ 801 | 727 |
| Directional Coupler | Lab Plant | RX 1026 | 738 |

Appendix 2
Test Configurations

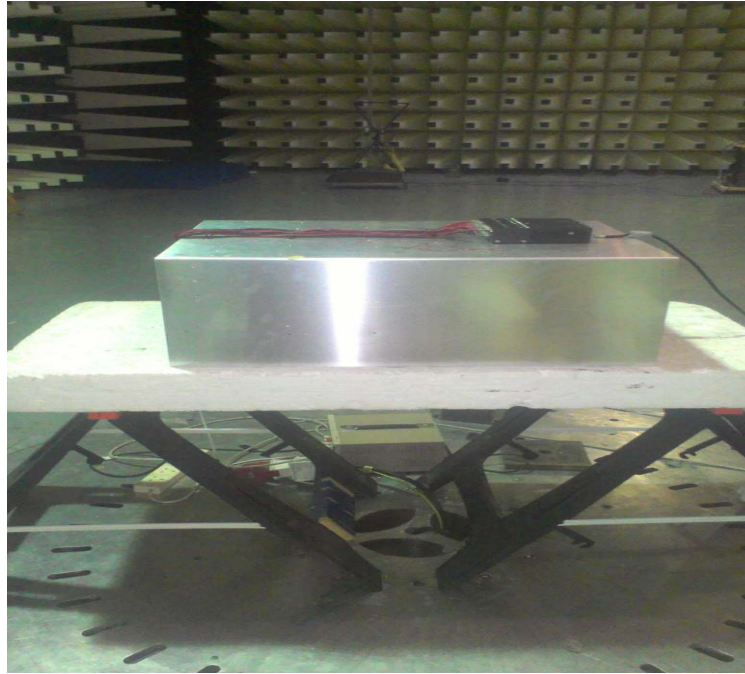


Figure 1: Radiated Emissions Test Set up

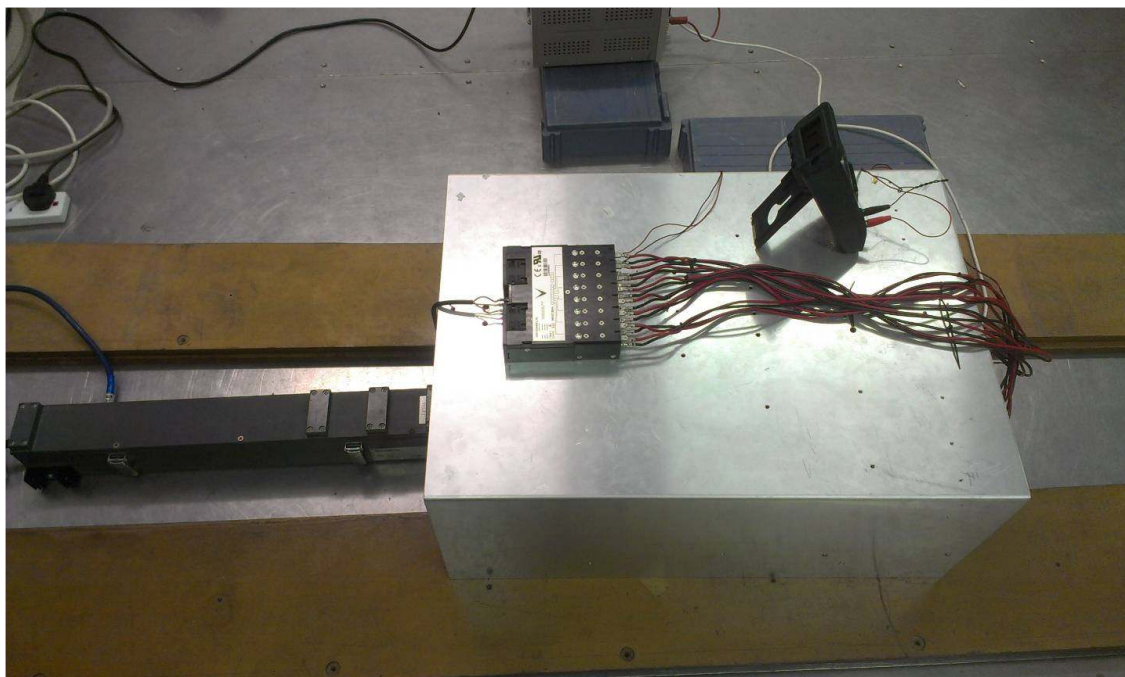


Figure 2: Conducted Immunity Test Set up

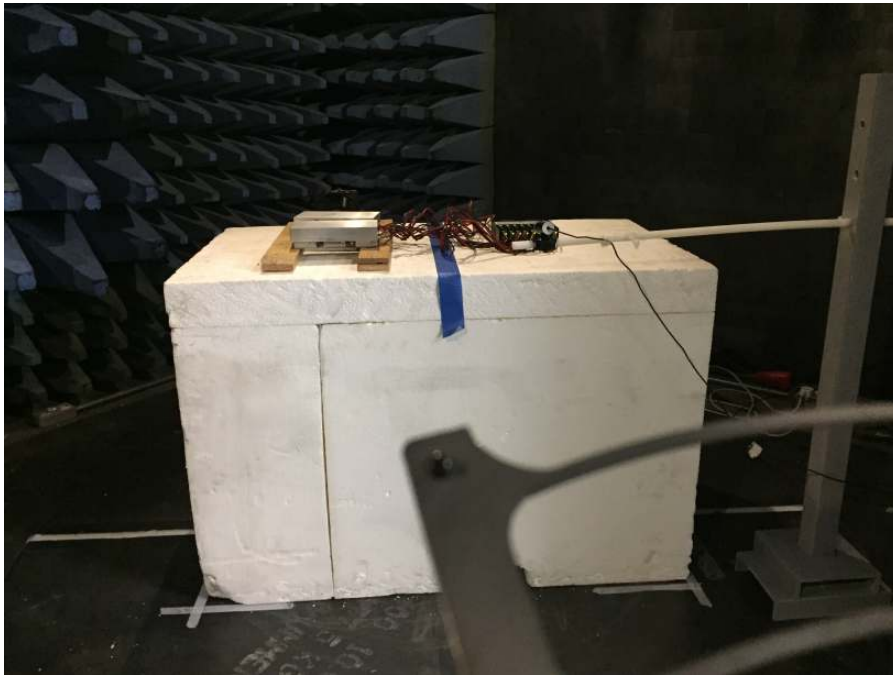


Figure 3: Radiated Immunity Test Set up

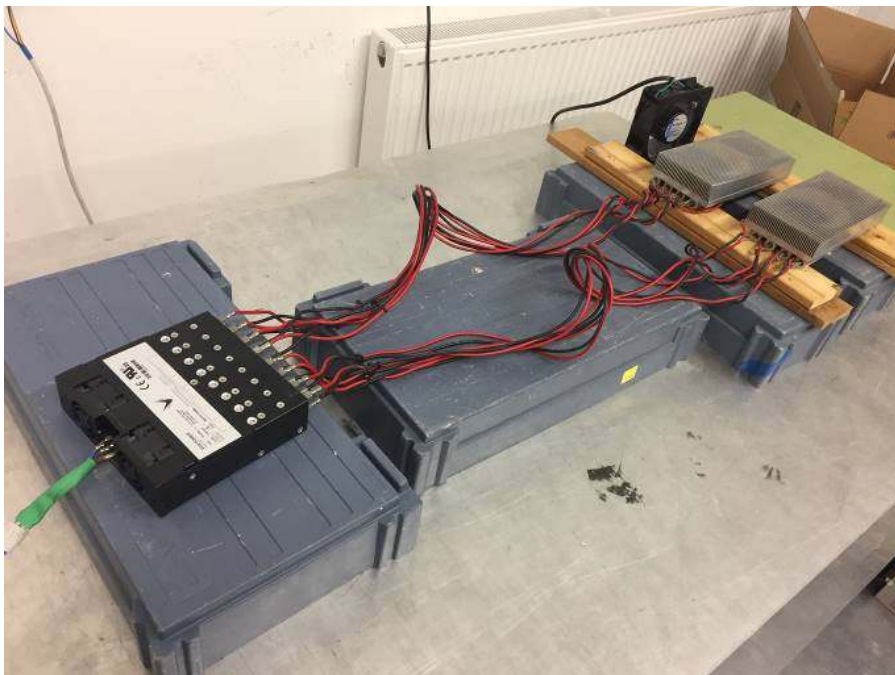


Figure 4: Fast Transients Test Set up

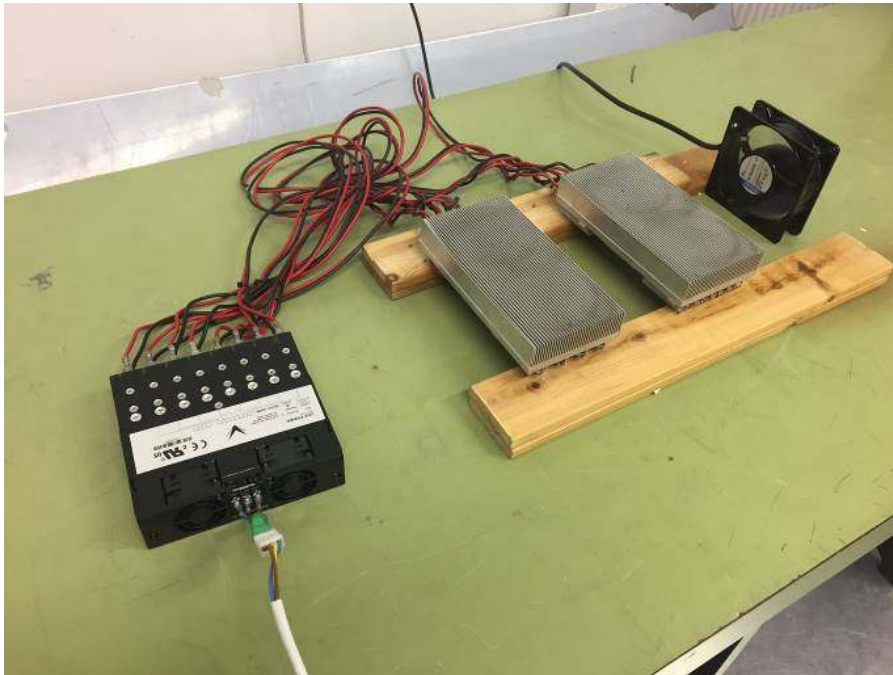


Figure 5: Surges / Voltage Dips & Interruptions Test Set up



Figure 6: ESD Test set up

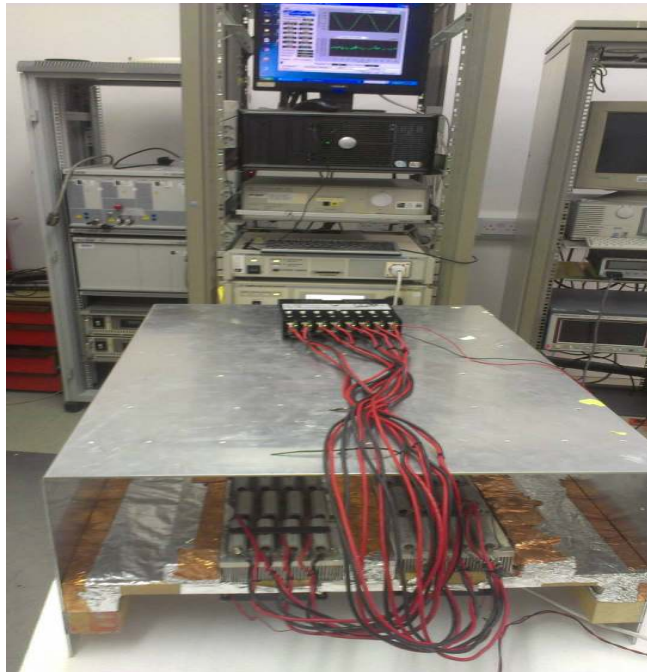


Figure 7: Harmonic and Flicker Test set up

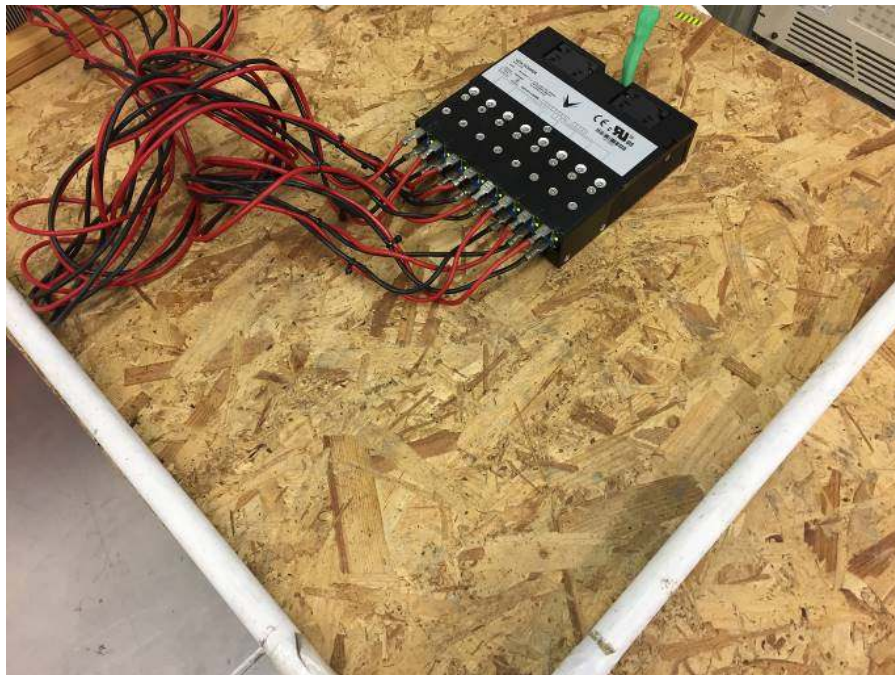


Figure 8: Magnetic field Test set up

Appendix 3: Results

Compliance Engineering Ireland Ltd Conducted Emissions

23. Aug 13 15:15

Manuf: VoxPower
Operator: L Brien
Comment: Live

Scan Settings (1 Range)

|----- Frequencies -----||----- Receiver Settings -----|
Start Stop Step IF BW Detector M-Time Atten Preamp OpRge
150k 30M 5k 10k PK+AV 20ms AUTO LN OFF 60dB

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 8
Acc Margin: 20dB

| Transducer No. | Start | Stop | Name |
|----------------|-------|------|------|
| 1 | 9k | 30M | LISN |

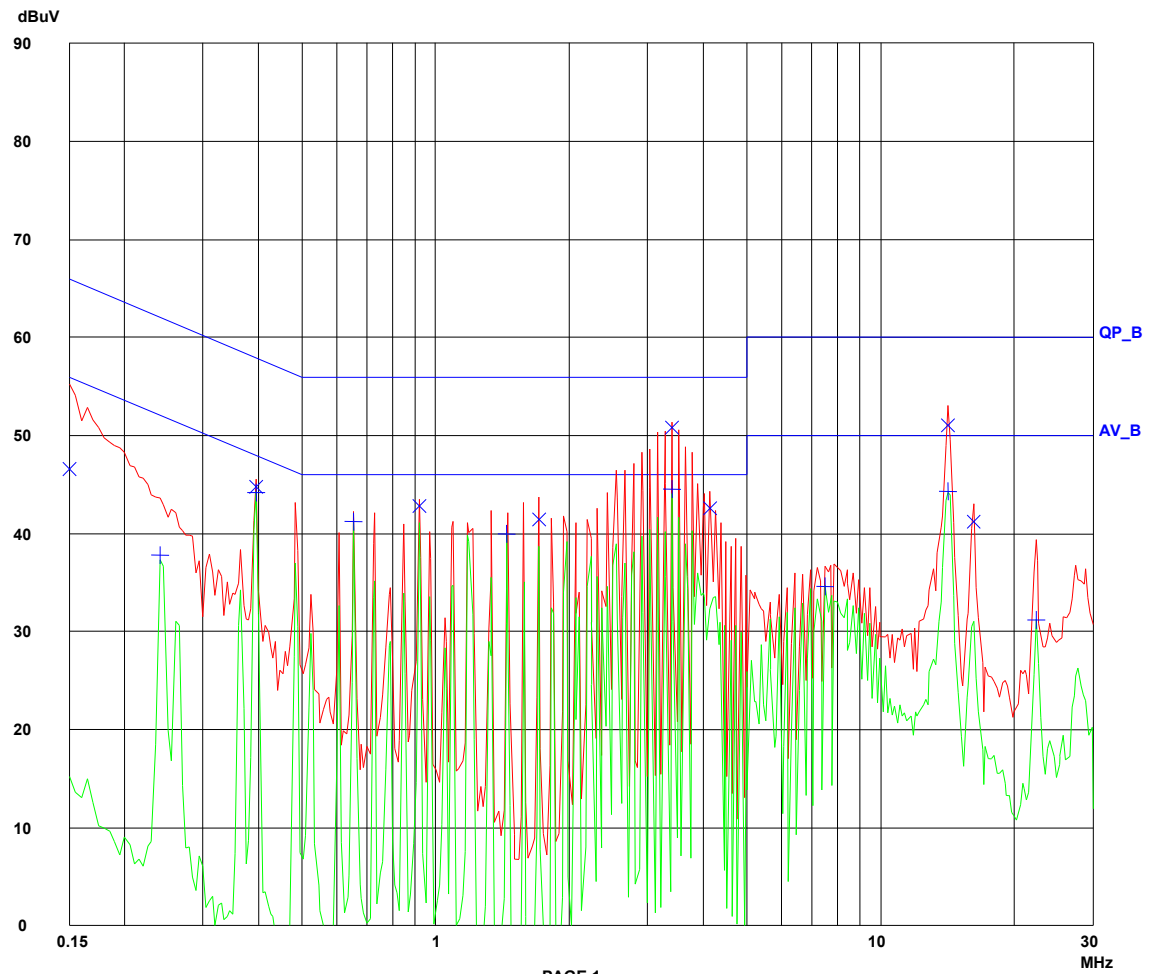


Figure 1: Conducted Emissions, Live (Class B)

Compliance Engineering Ireland Ltd

Conducted Emissions

23. Aug 13 15:30

Manuf: Vox Power
Operator: L Brien
Comment: Neutral

Scan Settings (1 Range)

----- Frequencies -----||----- Receiver Settings -----|
Start Stop Step IF BW Detector M-Time Atten Preamp OpRge
150k 30M 5k 10k PK+AV 20ms AUTO LN OFF 60dB

Final Measurement: x QP / + AV

Meas Time: 1 s
Subranges: 8
Acc Margin: 20dB

| Transducer No. | Start | Stop | Name |
|----------------|-------|------|------|
| 1 | 9k | 30M | LISN |

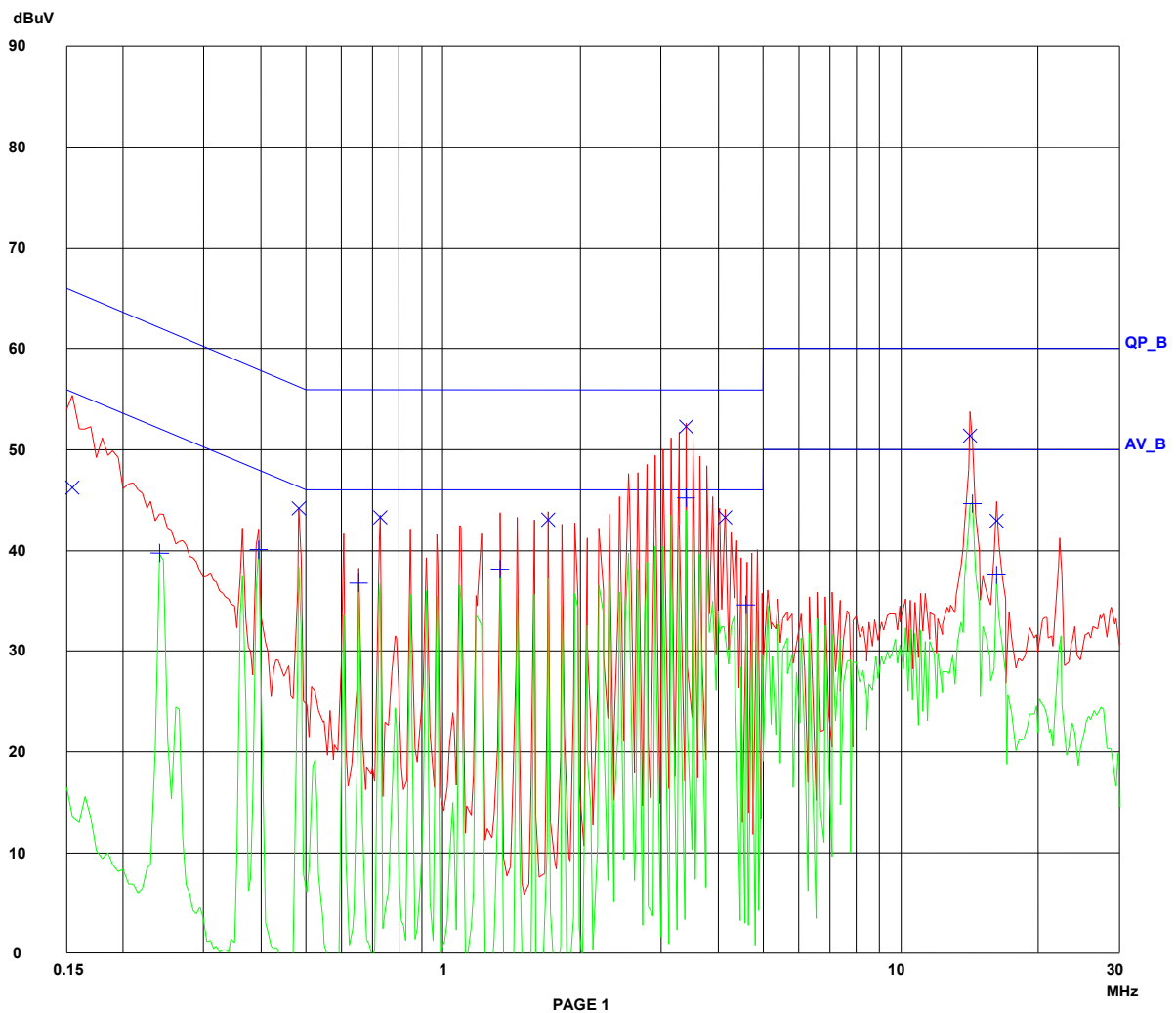


Figure 2: Conducted Emissions, Neutral (Class B)

RADIATED EMISSIONS

23. Aug 13 09:09

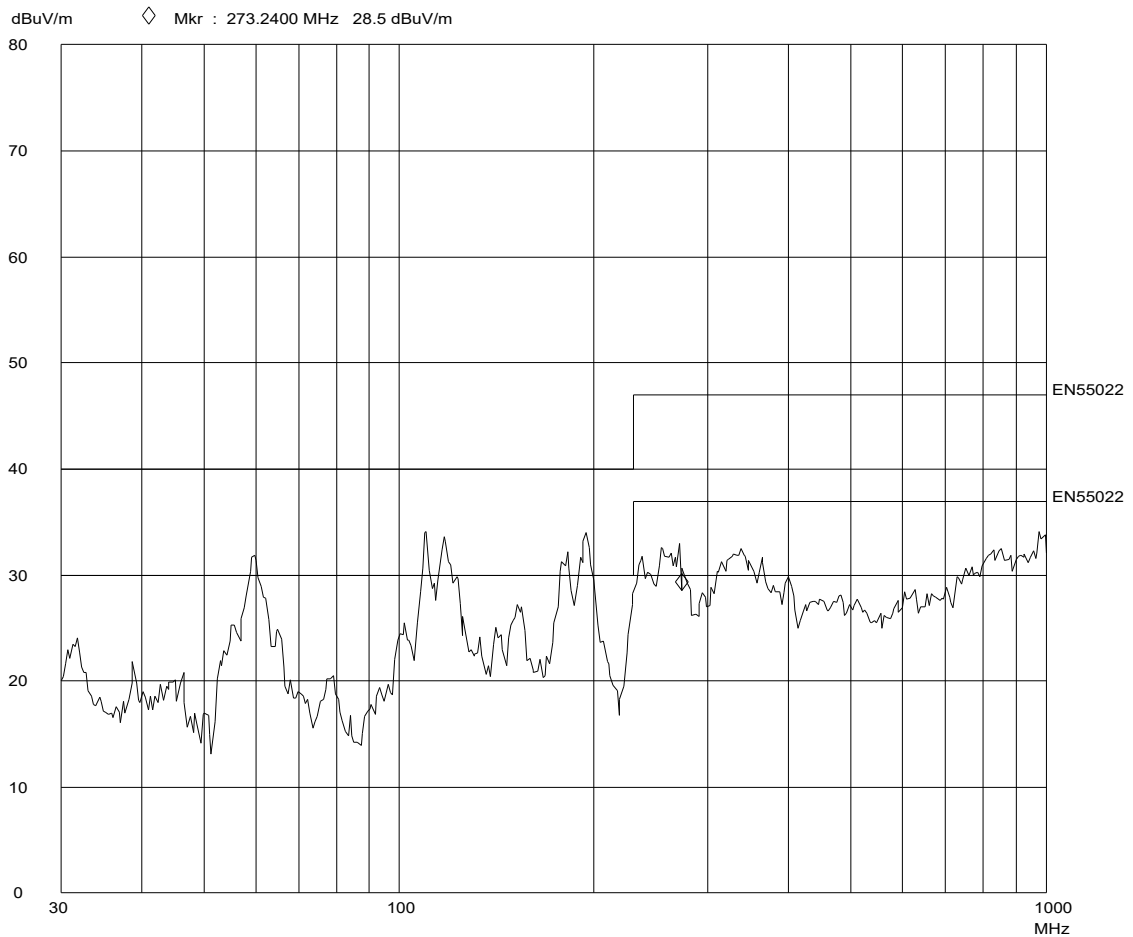
Manuf: Kelsius
Op Cond: Normal
Operator: J McAuley
Test Spec: EN 55022
Comment: NO CABLES

Scan Settings (1 Range)

| Frequencies | | | | Receiver Settings | | | |
|-------------|-------|------|-------|-------------------|--------|-----------|--------------|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp OpRge |
| 30M | 1000M | 120k | 120k | PK | 5ms | 0dBLN OFF | 60dB |

Final Measurement: x Hor-Max / + Vert-Max
Meas Time: 1 s
Subranges: 8
Acc Margin: 0dB

| Transducer No. | Start | Stop | Name |
|----------------|-------|-------|---------------|
| 3 | 9 | 20M | 1000M CEIL615 |
| 19 | 30M | 1000M | BILOG |



**Figure 3: Radiated Emissions, Vertical Scan (Class A)
Pre-scan**

RADIATED EMISSIONS

23. Aug 13 08:45

Manuf: Kelsius
Op Cond: Normal
Operator: J McAuley
Test Spec: EN 55022
Comment: NO CABLES

Scan Settings (1 Range)

| Frequencies | | | Receiver Settings | | | | | |
|-------------|-------|------|-------------------|----------|--------|-------|---------|-------|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp | OpRge |
| 30M | 1000M | 120k | 120k | PK | 5ms | 0dB | BLN OFF | 60dB |

Final Measurement: x Hor-Max / + Vert-Max
Meas Time: 1 s
Subranges: 8
Acc Margin: 0dB

| Transducer No. | Start | Stop | Name | |
|----------------|-------|-------|-------|---------|
| 3 | 9 | 20M | 1000M | CEIL615 |
| 19 | 30M | 1000M | BILOG | |

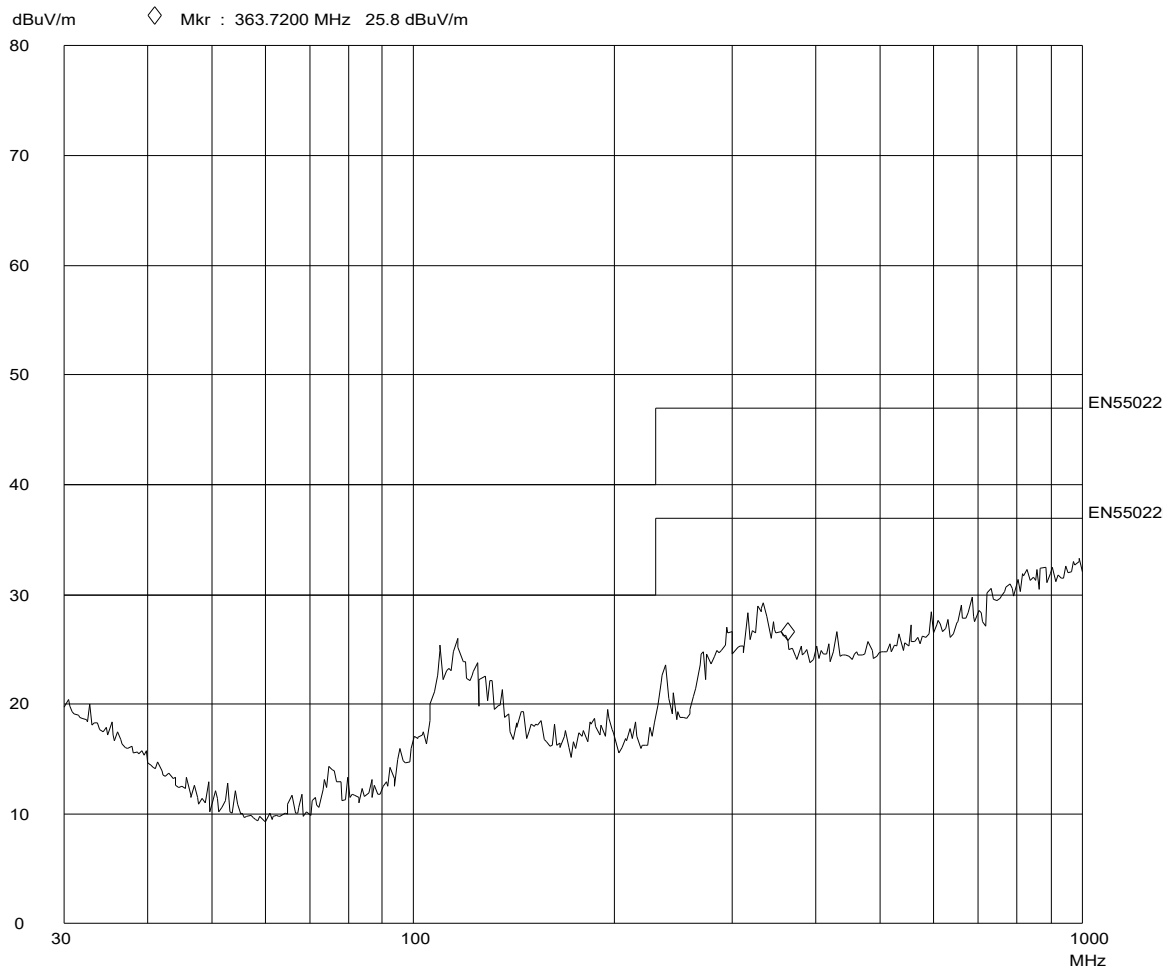


Figure 4: Radiated Emissions, Horizontal Scan (Class A)

Pre-scan

| Frequency MHz | QP Level dBuV/m | Limit dbuV/m | Antenna Polarity | Antenna Height (m) | Pass / Fail |
|--------------------------|----------------------------|-------------------------|-----------------------------|-------------------------------|------------------------|
| 117.572 | 32.4 | 40 | Vertical | 1.00 | Pass |
| 274.200 | 28.7 | 47 | Vertical | 1.00 | Pass |
| 235.484 | 28.1 | 47 | Vertical | 1.00 | Pass |
| 150.480 | 25.6 | 40 | Vertical | 1.00 | Pass |
| 116.240 | 33.1 | 40 | Horizontal | 4.00 | Pass |

Table 1:

Radiated Emissions, 30MHz -1GHz, Class A Limits– Anechoic Chamber at 10metres

Figure 3 and 4 are peak level scan used to indicate peaks

RADIATED EMISSIONS

23. Aug 13 09:36

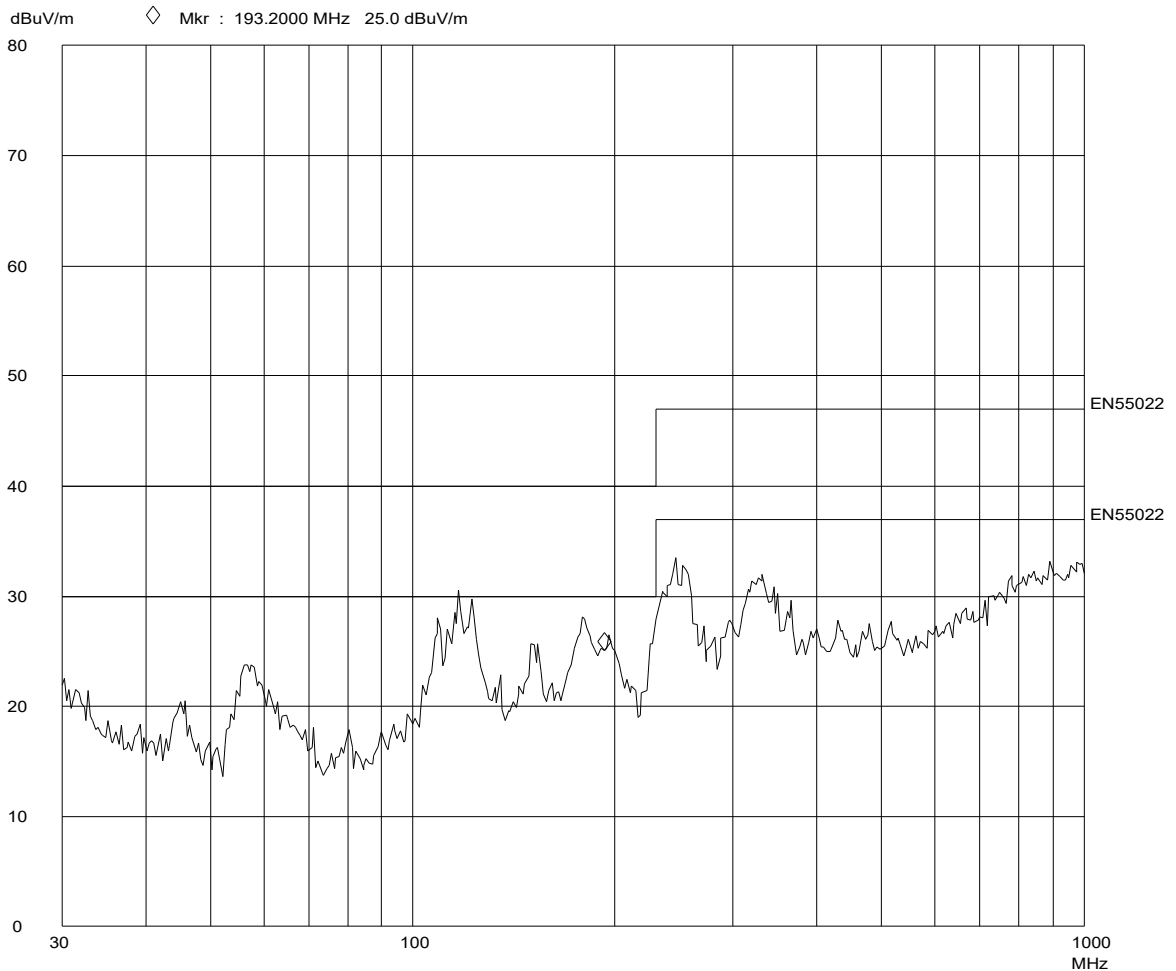
Manuf: Kelsius
Op Cond: Normal
Operator: J McAuley
Test Spec: EN 55022
Comment: NO CABLES

Scan Settings (1 Range)

| Frequencies | | | | Receiver Settings | | | | |
|-------------|-------|------|-------|-------------------|--------|-------|---------|-------|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp | OpRge |
| 30M | 1000M | 120k | 120k | PK | 5ms | 0dB | BLN OFF | 60dB |

Final Measurement: x Hor-Max / + Vert-Max
Meas Time: 1 s
Subranges: 8
Acc Margin: 0dB

| Transducer No. | Start | Stop | Name |
|----------------|-------|-------|---------|
| 3 9 | 20M | 1000M | CEIL615 |
| 19 | 30M | 1000M | BILOG |



**Figure 5: Radiated Emissions, Vertical Scan (Class B)
Pre-scan**

RADIATED EMISSIONS

23. Aug 13 09:44

Manuf: Kelsius
Op Cond: Normal
Operator: J McAuley
Test Spec: EN 55022
Comment: NO CABLES

Scan Settings (1 Range)

| Frequencies | | | Receiver Settings | | | | | |
|-------------|-------|------|-------------------|----------|--------|-------|---------|-------|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp | OpRge |
| 30M | 1000M | 120k | 120k | PK | 5ms | 0dB | BLN OFF | 60dB |

Final Measurement: x Hor-Max / + Vert-Max
Meas Time: 1 s
Subranges: 8
Acc Margin: 0dB

| Transducer No. | Start | Stop | Name | |
|----------------|-------|-------|-------|---------|
| 3 | 9 | 20M | 1000M | CEIL615 |
| 19 | 30M | 1000M | BILOG | |

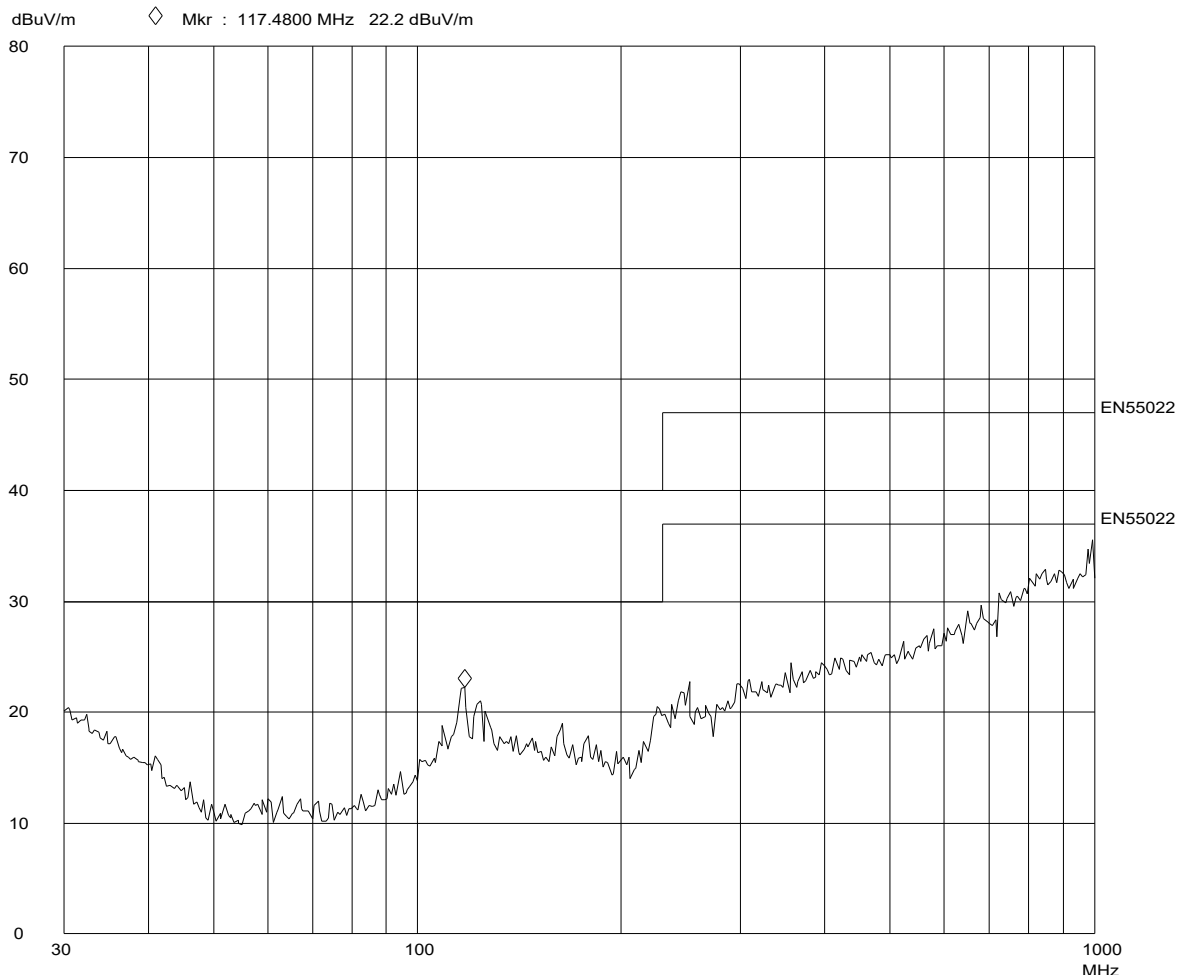


Figure 6: Radiated Emissions, Horizontal Scan (Class B) Pre-scan

| Frequency MHz | QP Level dBuV/m | EN55022 Limit dbuV/m | Antenna Polarity | Antenna Height (m) | Pass / Fail |
|--------------------------|----------------------------|-------------------------------------|-----------------------------|-------------------------------|------------------------|
| 117.652 | 23.1 | 30 | Vertical | 1.00 | Pass |
| 229.652 | 28.0 | 30 | Vertical | 1.00 | Pass |
| 117.700 | 26.6 | 30 | Horizontal | 4.00 | Pass |

Table 1:

Radiated Emissions, with ferrites 30MHz -1GHz, Class B Limits– Anechoic Chamber at 10metres

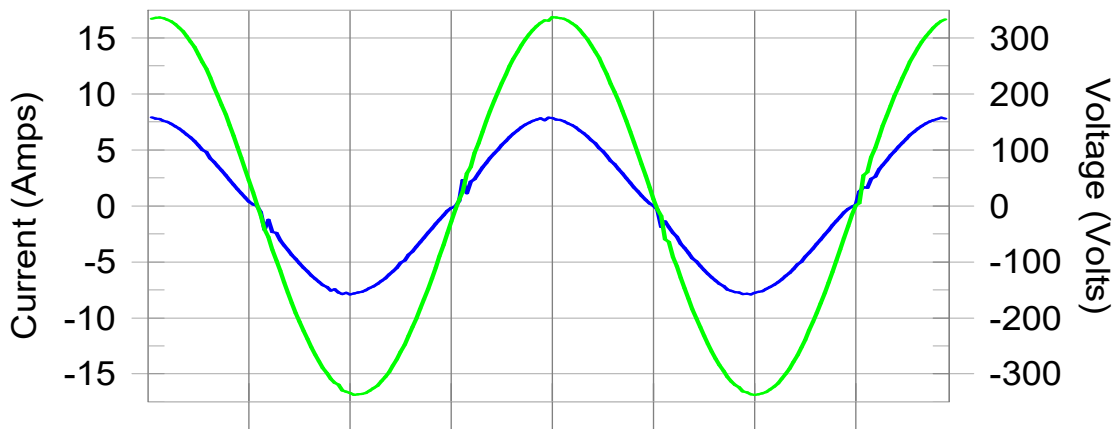
Figure 5 and 6 are peak level scan used to indicate peaks

Harmonics – Class-A per Ed. 3.0 (2005-11) (Run time)

EUT: Nevo1200 Tested by: Lewis Brien
Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
Test date: 24/10/2013 Start time: 16:37:26 End time: 16:47:47
Test duration (min): 10 Data file name: H-001712.cts_data
Comment: Comments
Customer: Vox Power 13E4772

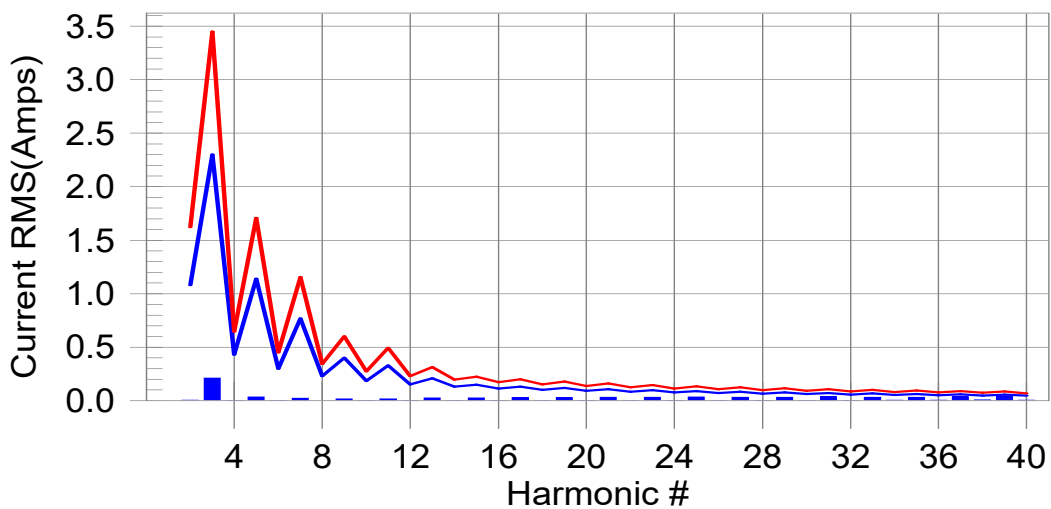
Test Result: Pass **Source qualification: Distorted**

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass **Worst harmonic was #39 with 70.28% of the limit.**

Current Test Result Summary (Run time)

EUT: Nevo1200 Tested by: Lewis Brien
 Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
 Test date: 24/10/2013 Start time: 16:37:26 End time: 16:47:47
 Test duration (min): 10 Data file name: H-001712.cts_data
 Comment: Comments
 Customer: Vox Power 13E4772

Test Result: Pass Source qualification: Distorted
 THC (A): 0.24 I-THD (%): 4.55 POHC (A): 0.105 POHC Limit (A): 0.251
 Highest parameter values during test:
 V_RMS (Volts): 238.20 Frequency (Hz): 50.00
 I-Peak (Amps): 8.161 I-RMS (Amps): 5.393
 I-Fund (Amps): 5.383 Crest Factor: 1.517
 Power (Watts): 1276.7 Power Factor: 0.994

| Harm# | Harms (avg) | 100%Limit | %of Limit | Harms (max) | 150%Limit | %of Limit | Status |
|-------|-------------|-----------|-----------|-------------|-----------|-----------|--------|
| 2 | 0.004 | 1.080 | 0.4 | 0.006 | 1.620 | 0.35 | Pass |
| 3 | 0.208 | 2.300 | 9.1 | 0.214 | 3.450 | 6.20 | Pass |
| 4 | 0.002 | 0.430 | 0.5 | 0.004 | 0.645 | 0.56 | Pass |
| 5 | 0.036 | 1.140 | 3.1 | 0.037 | 1.710 | 2.18 | Pass |
| 6 | 0.002 | 0.300 | 0.6 | 0.002 | 0.450 | 0.51 | Pass |
| 7 | 0.021 | 0.770 | 2.8 | 0.022 | 1.155 | 1.94 | Pass |
| 8 | 0.001 | 0.230 | 0.5 | 0.002 | 0.345 | 0.55 | Pass |
| 9 | 0.017 | 0.400 | 4.2 | 0.018 | 0.600 | 3.01 | Pass |
| 10 | 0.001 | 0.184 | 0.8 | 0.002 | 0.276 | 0.83 | Pass |
| 11 | 0.017 | 0.330 | 5.2 | 0.018 | 0.495 | 3.68 | Pass |
| 12 | 0.002 | 0.153 | 1.5 | 0.003 | 0.230 | 1.19 | Pass |
| 13 | 0.025 | 0.210 | 11.8 | 0.026 | 0.315 | 8.22 | Pass |
| 14 | 0.002 | 0.131 | 1.8 | 0.003 | 0.197 | 1.76 | Pass |
| 15 | 0.024 | 0.150 | 15.8 | 0.026 | 0.225 | 11.36 | Pass |
| 16 | 0.002 | 0.115 | 1.5 | 0.003 | 0.173 | 1.75 | Pass |
| 17 | 0.028 | 0.132 | 20.9 | 0.029 | 0.199 | 14.55 | Pass |
| 18 | 0.002 | 0.102 | 2.0 | 0.003 | 0.153 | 1.81 | Pass |
| 19 | 0.028 | 0.118 | 24.0 | 0.030 | 0.178 | 16.89 | Pass |
| 20 | 0.002 | 0.092 | 1.9 | 0.003 | 0.138 | 2.34 | Pass |
| 21 | 0.031 | 0.107 | 28.6 | 0.032 | 0.161 | 19.81 | Pass |
| 22 | 0.002 | 0.084 | 2.3 | 0.003 | 0.125 | 2.40 | Pass |
| 23 | 0.033 | 0.098 | 33.5 | 0.034 | 0.147 | 23.30 | Pass |
| 24 | 0.002 | 0.077 | 2.4 | 0.003 | 0.115 | 2.71 | Pass |
| 25 | 0.033 | 0.090 | 36.5 | 0.035 | 0.135 | 25.56 | Pass |
| 26 | 0.002 | 0.071 | 3.0 | 0.003 | 0.106 | 2.77 | Pass |
| 27 | 0.030 | 0.083 | 36.3 | 0.032 | 0.125 | 25.83 | Pass |
| 28 | 0.003 | 0.066 | 4.4 | 0.004 | 0.099 | 4.12 | Pass |
| 29 | 0.029 | 0.078 | 37.9 | 0.032 | 0.116 | 27.21 | Pass |
| 30 | 0.002 | 0.061 | 3.9 | 0.004 | 0.092 | 4.14 | Pass |
| 31 | 0.037 | 0.073 | 50.5 | 0.038 | 0.109 | 34.96 | Pass |
| 32 | 0.002 | 0.058 | 3.8 | 0.004 | 0.086 | 4.14 | Pass |
| 33 | 0.032 | 0.068 | 47.4 | 0.034 | 0.102 | 33.51 | Pass |
| 34 | 0.003 | 0.054 | 5.4 | 0.005 | 0.081 | 5.77 | Pass |
| 35 | 0.030 | 0.064 | 47.2 | 0.032 | 0.096 | 33.69 | Pass |
| 36 | 0.003 | 0.051 | 6.1 | 0.005 | 0.077 | 6.11 | Pass |
| 37 | 0.038 | 0.061 | 63.0 | 0.040 | 0.091 | 44.37 | Pass |
| 38 | 0.003 | 0.048 | 6.9 | 0.008 | 0.073 | 10.28 | Pass |
| 39 | 0.041 | 0.058 | 70.3 | 0.043 | 0.087 | 49.03 | Pass |
| 40 | 0.003 | 0.046 | 6.0 | 0.005 | 0.069 | 6.85 | Pass |

Voltage Source Verification Data (Run time)

EUT: Nevo1200
 Test category: Class-A per Ed. 3.0 (2005-11) (European limits)
 Test date: 24/10/2013
 Test duration (min): 10
 Comment: Comments
 Customer: Vox Power 13E4772

Tested by: Lewis Brien
 Test Margin: 100
 Start time: 16:37:26
 End time: 16:47:47
 Data file name: H-001712.cts_data

Test Result: Pass Source qualification: Distorted

Highest parameter values during test:

Voltage (Vrms): 238.20
 I-Peak (Amps): 8.161
 I-Fund (Amps): 5.383
 Power (Watts): 1276.7

Frequency (Hz): 50.00
 I-RMS (Amps): 5.393
 Crest Factor: 1.517
 Power Factor: 0.994

| Harm# | Harmonics V-rms | Limit V-rms | % of Limit | Status |
|-------|-----------------|-------------|------------|--------|
| 2 | 0.137 | 0.476 | 28.70 | OK |
| 3 | 0.275 | 2.142 | 12.82 | OK |
| 4 | 0.159 | 0.476 | 33.49 | OK |
| 5 | 0.283 | 0.952 | 29.74 | OK |
| 6 | 0.107 | 0.476 | 22.53 | OK |
| 7 | 0.177 | 0.714 | 24.78 | OK |
| 8 | 0.096 | 0.476 | 20.10 | OK |
| 9 | 0.169 | 0.476 | 35.50 | OK |
| 10 | 0.078 | 0.476 | 16.28 | OK |
| 11 | 0.200 | 0.238 | 83.96 | OK |
| 12 | 0.083 | 0.238 | 34.92 | OK |
| 13 | 0.219 | 0.238 | 91.88 | OK |
| 14 | 0.106 | 0.238 | 44.64 | OK |
| 15 | 0.142 | 0.238 | 59.56 | OK |
| 16 | 0.074 | 0.238 | 31.25 | OK |
| 17 | 0.182 | 0.238 | 76.37 | OK |
| 18 | 0.078 | 0.238 | 32.76 | OK |
| 19 | 0.209 | 0.238 | 87.72 | OK |
| 20 | 0.073 | 0.238 | 30.62 | OK |
| 21 | 0.241 | 0.238 | 101.37 | Marg. |
| 22 | 0.075 | 0.238 | 31.36 | OK |
| 23 | 0.289 | 0.238 | 121.56 | Dist. |
| 24 | 0.068 | 0.238 | 28.70 | OK |
| 25 | 0.260 | 0.238 | 109.15 | Marg. |
| 26 | 0.069 | 0.238 | 29.05 | OK |
| 27 | 0.258 | 0.238 | 108.34 | Marg. |
| 28 | 0.092 | 0.238 | 38.62 | OK |
| 29 | 0.295 | 0.238 | 123.75 | Dist. |
| 30 | 0.073 | 0.238 | 30.55 | OK |
| 31 | 0.380 | 0.238 | 159.50 | Dist. |
| 32 | 0.076 | 0.238 | 31.78 | OK |
| 33 | 0.301 | 0.238 | 126.24 | Dist. |
| 34 | 0.090 | 0.238 | 37.81 | OK |
| 35 | 0.329 | 0.238 | 138.20 | Dist. |
| 36 | 0.077 | 0.238 | 32.13 | OK |
| 37 | 0.453 | 0.238 | 190.19 | Dist. |
| 38 | 0.093 | 0.238 | 38.84 | OK |
| 39 | 0.422 | 0.238 | 177.10 | Dist. |
| 40 | 0.064 | 0.238 | 26.80 | OK |

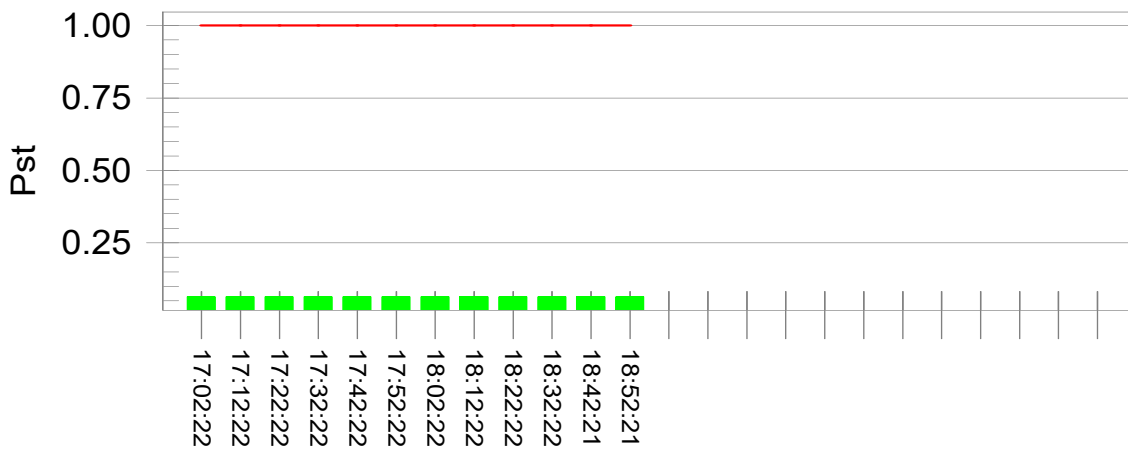
Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: Nevo1200
 Test category: All parameters (European limits)
 Test date: 24/10/2013
 Test duration (min): 120
 Comment: Comments
 Customer: Vox Power 13E4772

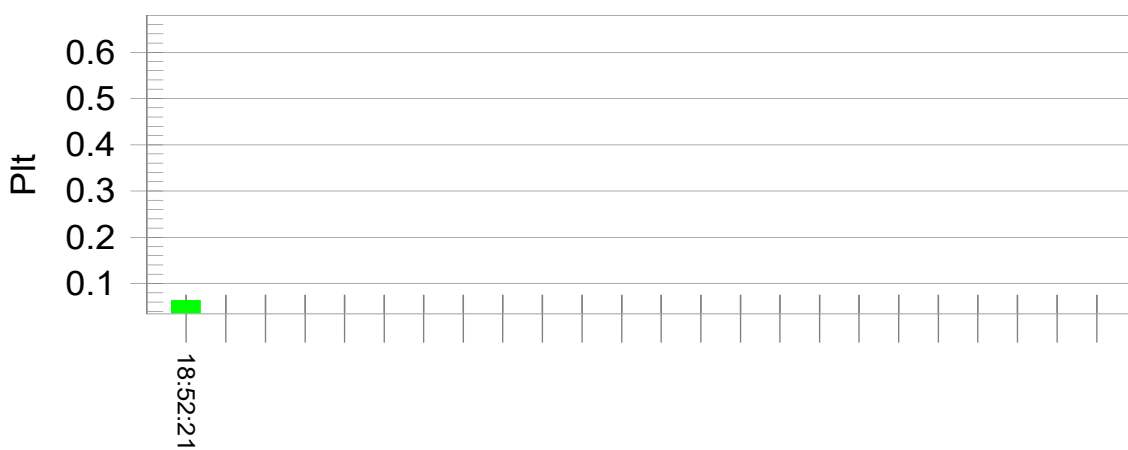
Tested by: L Brien
 Test Margin: 100
 Start time: 16:52:02
 End time: 18:52:23
 Data file name: F-001713.cts_data

Test Result: Pass Status: Test Completed

Pst and limit line European Limits



Plt and limit line



Parameter values recorded during the test:

| | | | |
|---------------------------------|--------|------------------|-----------------|
| Vrms at the end of test (Volt): | 238.06 | | |
| Highest dt (%): | 0.21 | Test limit (%): | 3.30 Pass |
| Time (mS) > dt: | 0.0 | Test limit (mS): | 500.0 Pass |
| Highest dc (%): | 0.10 | Test limit (%): | 3.30 Pass |
| Highest dmax (%): | -0.21 | Test limit (%): | 4.00 Pass |
| Highest Pst (10 min. period): | 0.064 | Test limit: | 1.000 Pass |
| Highest Plt (2 hr. period): | 0.064 | Test limit: | 0.650 Pass |