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EMC TEST REPORT

Report ID
REP066024

Project ID
PRJ0066902

Type of assessment:

Applicant:
Nanoptix Inc.

Product:
Spill-Proof Printer

Models:
100769/950023

Model variant(s):
103665/950005

Specifications:

- EN 55032:2015/A11:2020
- CISPR 32:2015/AMD1:2019
- AS/NZS CISPR 32:2015 AMD 1: 2020
- FCC 47 CFR Part 15, Subpart B
- ICES-003 Issue 7 October 2020
- EN 61000-3-2:2014
- EN 61000-3-3:2013

Date of issue: November 15, 2024

Daniel Hynes, Senior EMC Specialist and Avul Nzenza, EMC Specialist
Tested by

David Duchesne, EMC/RF Lab Manager
Reviewed by

Signature

Lab locations

Company name	Nemko Canada Inc.
Facilities	**Ottawa site:** 303 River Road, Ottawa, ON, Canada, K1V 1H2 Tel: +1 613 737 9680, Fax: +1 613 737 9691 **Montréal site:** 292 Labrosse Avenue, Pointe-Claire, QC, Canada, H9R 5L8 Tel: +1 514 694 2684, Fax: +1 514 694 3528 **Cambridge site:** 1-130 Saltsman Drive, Cambridge, ON, Canada, N3E 0B2 Tel: +1 519 650 4811
Test site registration number:	– CA2040 (Ottawa) – CA2041 (Montreal) – CA0101 (Cambridge)
Website	www.nemko.com

Limits of responsibility

Note that this report's results relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of this report.
This test report has been completed following the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

Table of Contents

Section 1 Report summary

1.1 Test specifications

EN 55032:2015/A11:2020	Electromagnetic compatibility of multimedia equipment – Emission requirements
AS/NZS CISPR 32:2015 AMD 1:2020	Electromagnetic compatibility of multimedia equipment – Emission requirements
CISPR 32:2015/AMD1:2019	Electromagnetic compatibility of multimedia equipment – Emission requirements
FCC 47 CFR Part 15, Subpart B	Title 47: Telecommunication; Part 15—Radio Frequency Devices
ICES-003 Issue 7 October 2020	Information Technology Equipment (including Digital Apparatus)
ICES-Gen Issue 2, Feb 2024	General Requirements for Compliance of Interference-Causing Equipment
EN 61000-3-2:2014	Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3:2013	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

1.2 Exclusions

None

1.3 Statement of compliance

In the configuration tested, the EUT was found compliant.

Unless noted in section 1.2, all testing was performed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.4 Test report revision history

Table 1.4-1: *Test report history*

Report ID.	Date of issue	Details of changes made to test report
275244-1TRFEMC	January 13, 2015	Original report issued
REP066024	November 15, 2024	New report issued to latest versions of standards.

Section 2 Engineering considerations

2.1 Modifications incorporated in the EUT for compliance

The following modifications were performed by client in order to comply with radiated emissions requirements (Internal part numbers in parenthesis.):

Removed:

1. **R313, R314, R315**: 0R, 0402 (240008-0000R)
2. **C310B:** 100uF, 35V (230011-1008R)

Added:

3. **C465**: 0.1uF, 0603 (230001-1005R)
4. **C457, C458, C459, C802**: 0.1uF, 0402 (230015-1005R)
5. **C462, C463, C464**: 10uF, 1206 (230013-1007R)
6. **C700, C750, C800, C851**: 10uF, 0805 (230010-1007R)
7. **Z300**: 5V TVS, SP0505BAHTG (242012-5000R)
8. **L300, L301, L302**: Ferrite beads BLM15AG102SN1D (237002-1003R)
9. **C310A**: 220uF, 35V (100579-2023R)

There were no wire mods. The components added already had a footprint on the PCB so they will be added to the released BOM for this printer's main board.

These modifications were present during all testing.

2.2 Technical judgment

The new report has been updated to align with the latest versions of the standards. Data from the original assessment was utilized, and no additional testing was required.

2.3 Model variant declaration

As declared by the applicant, the EUT model 100769/950023 (Spill-Proof printer) has been chosen to be representative for all other models in the model family. The model family, and the description of the variations, are as follows:

Model variant 103665/950005: Details: Same main board and the same print mechanism as the Spill-Proof printer. This printer has its main board enclosed into a metal shell and is assumed to be better shielded than the Spill-Proof printer. The PayCheck Slim printer is designed to fit inside a cabinet.

2.4 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 3 Test conditions

3.1 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the present document, the nominal voltage shall be the declared voltage, or any of the stated voltages ±5 %, for which the equipment was designed.

Section 4 Information provided by the applicant

4.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results contained within this test report. Nemko accepts no responsibility for the information within this section and its impact on the test plan and resulting measurements.

4.2 Applicant/Manufacturer

Applicant name	Nanoptix Inc.
Applicant address	699 Champlain Street, Dieppe, NB, E1A 1P6, Canada
Manufacturer name	Same as applicant
Manufacturer address	Same as applicant

4.3 EUT information

Product	Spill-Proof Printer
Model	100769 / 950023
Serial number	SP00001
Part number	100769 / 950023
Power requirements	100-240 V_{AC}, 50/60 Hz
Description/theory of operation	Thermal printer. To insert the paper, open the top cover. Pass the paper between the top cover and the base and pull it up to the front. Close the cover. Power the printer. This printer is used to print receipts. It can receive print jobs from either USB full speed or RS-232.
Operational frequencies	192 MHz internal to the processor 96 MHz between the processor and the memory chips.
Software details	Firmware version SPL-5.68A

4.4 EUT setup details

4.4.1 EUT Exercise and monitoring

Methods used to exercise the EUT and all relevant ports:

- The EUT was configured to operate continuously printing once every 5 seconds. Verification of the printer quality as well as continued printing was used to assess any impact caused by immunity testing.

Configuration details:

- The EUT was set up in a configuration that was expected to produce the highest amplitude emissions relative to the limit and that satisfy normal operation/installation practice by the end-user.
- The type and construction of cables used in the measurement setup were consistent with normal or typical use.
- The EUT was set up in a manner that was consistent with its typical arrangement and use. The measurement arrangement of the EUT, local AE and associated cabling was representative of normal practice.

4.4.2 EUT test configuration

Table 4.4-1: *EUT sub-assemblies*

Description	Brand name	Model/Part number	Serial number	Rev.
Spill-Proof Printer	Nanoptix	950023/100769	SP00001	---

Table 4.4-2: *EUT interface ports*

Description	Qty.
Power Input	1
USB	1
Serial	1

Table 4.4-3: *Support equipment*

Description	Brand name	Serial number, Part number, Model, Revision level
Laptop Computer	Dell	Latitude D820
ITE Power Supply	Nanoptix	GT-21126-6024 / GS-1110

Table 4.4-4: *Inter-connection cables*

Cable description	From	To	Length (m)
2 Conductor DC Power Cable	EUT	AC/DC Power Adapter	2
DB9 to DB9 Null Cable (Female to Female)	EUT	Laptop Computer	7
Mini-B to Standard USB Cable	EUT	Laptop Computer	6

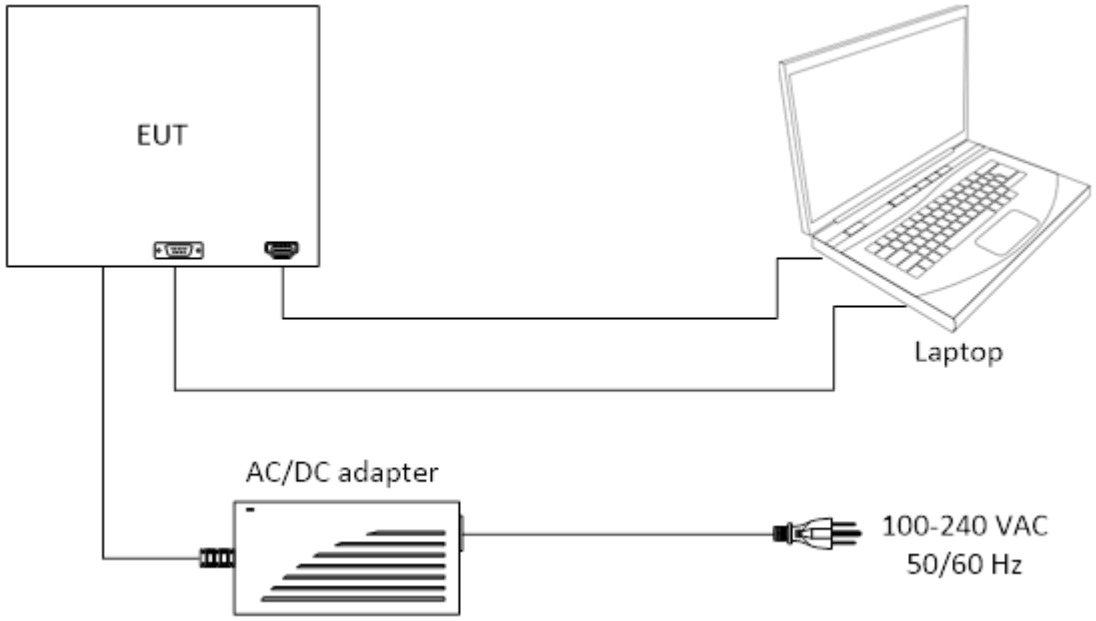

Figure 4.4-1: *Block diagram*

Section 5 Summary of test results

5.1 Testing period

Test start date	December 19, 2014	Test end date	January 8, 2015

5.2 Sample information

Receipt date	December 5, 2014	Nemko sample ID number	Item # 11

5.3 Test results

Table 5.3-1: *EN 55032:2015/A11:2020, AS/NZS CISPR 32:2015 AMD 1:2020, and CISPR 32:2015/AMD1:2019 result summary for Class B equipment*

Clause	Test description	Verdict
A4.1, A4.2, A4.3, and A4.4	Radiated emissions at frequencies up to 1 GHz measured at 3 m distance (Facility: OATS / SAC / FAR)	Pass
A5.1 and A5.2	Radiated emissions at frequencies above 1 GHz measured at 3 m distance	Pass
A10.1 and A10.2	Conducted emissions from AC mains power ports	Pass
A12.1, A12.2, and A12.3	Conducted asymmetric mode emissions measured with AAN / CVP and current probe / Current probe	Not applicable
A13.1, A13.2, A13.3, A13.4, and A13.5	Conducted differential voltage emissions for: 1. Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers. 2. Tuner units (not the LNB) for satellite signal reception 3. Frequency modulation audio receivers and PC tuner cards 4. Frequency modulation car radios 5. EUTs with RF modulator output ports (for example, DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports	Not applicable

Notes: The EUT does not contain any interfaces as defined in clause A12 and A13

Table 5.3-2: *EN 61000-3-2:2014 results*

Test description	Verdict
Harmonic current emissions[1]	Pass

Notes: [1] The EUT utilizes less than 75 W. No limits are specified for equipment with less than 75 W input rating.

Table 5.3-3: *EN 61000-3-3:2013 results*

Test description	Verdict
Voltage fluctuations and flicker[1]	Pass

Notes: [1] The EUT is unlikely to produce significant voltage fluctuations or flicker. No testing required.

Table 5.3-4: *FCC 47 CFR Part 15, Subpart B and ICES-003 Issue 7 result summary*

Clause	Test description	Verdict
FCC 47 CFR Part 15, Subpart B		
§15.109	Radiated emissions limits[1]	Pass
§15.107	Conducted emissions limits (AC mains) [1]	Pass
ICES-003 Issue 7		
3.2.1	AC Power Line Conducted Emissions Limits[1]	Pass
3.2.2	Radiated Emissions Limits[1]	Pass

Notes: [1] Product classification B

Section 6 Terms and definitions

6.1 Product classifications and definitions

6.1.1 EN 55032, AS/NZS CISPR 32, and CISPR 32 – Equipment classification

Equipment classification	Equipment intended primarily for use in a residential environment shall meet the Class B limits. All other equipment shall comply with the Class A limits. Broadcast receiver equipment is class B equipment. The user documentation and/or manual shall contain details of any special measures required to be taken by the purchaser or user to ensure EMC compliance of the EUT with the requirements of this publication (EN 55032). One example would be the need to use shielded or special cables. Class A equipment shall have the following warning in the instructions for use to inform the user of the risk of operating this equipment in a residential environment: Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment, this equipment may cause radio interference.

6.1.2 Title 47: Telecommunication – Part 15-Radio Frequency devices, Subpart A – General – Equipment classification

Class A digital device	A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.
Class B digital device	A digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computers, calculators, and similar electronic devices that are marketed for use by the general public. Note: The responsible party may also qualify a device intended to be marketed in a commercial, business or industrial environment as a Class B device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B digital device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B digital device, regardless of its intended use.

6.1.3 ICES-GEN – Equipment classification

Class A	Equipment that is, by virtue of its characteristics, highly unlikely to be used in a residential environment, including a home business shall be classified as Class A and shall comply with the Class A limits specified in the applicable ICES standard. Characteristics considered in this assessment include price, marketing and advertising methodology, the degree to which the functional design inhibits applications suitable to residential environments, or any combination of features that would effectively preclude the use of such equipment in a residential environment.
Class B	Equipment that cannot be classified as Class A shall comply with the Class B limits specified in the applicable ICES standard.

Product classifications and definitions, continued

6.1.4 EN 61000-3-2 – Equipment classification

For the purpose of harmonic current limitation, equipment is classified as follows:

Class A	– Balanced three-phase equipment – Household appliances excluding equipment identified as Class D – Tools excluding portable tools – Dimmers for incandescent lamps – Audio equipment Equipment not specified in one of the three other classes shall be considered as Class A equipment.
Class B	– Portable tools – Arc welding equipment, which is not professional equipment
Class C	– Lighting equipment
Class D	Equipment having a specified power according to 6.2.2 less than or equal to 600 W, of the following types: – Personal computers and personal computer monitors – Television receivers – Refrigerators and freezers having one or more variable-speed drives to control compressor motor(s)

6.2 General definitions

6.2.1 EN 55032, AS/NZS CISPR 32, and CISPR 32 – Equipment type

Multimedia Equipment (MME)	Equipment that is information technology equipment, audio equipment, video equipment, broadcast receiver equipment, entertainment lighting control equipment or combinations of these.
Information technology equipment [ITE]	Equipment having a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control of data and/or telecommunication messages and which may be equipped with one or more ports typically for information transfer. – Examples include data processing equipment, office machines, electronic business equipment and telecommunication equipment.
Audio equipment	Equipment which has a primary function of either (or a combination of) generation, input, storage, play, retrieval, transmission, reception, amplification, processing, switching or control of audio signals
Video equipment	Equipment which has a primary function of either (or a combination of) generation, input, storage, display, play, retrieval, transmission, reception, amplification, processing, switching, or control of video signals.
Broadcast receiver equipment	Equipment containing a tuner that is intended for the reception of broadcast services – These broadcast services are typically television and radio services, including terrestrial broadcast, satellite broadcast and/or cable transmission.
Entertainment lighting control equipment	Equipment generating or processing electrical signals for controlling the intensity, color, nature or direction of the light from a luminaire, where the intention is to create artistic effects in theatrical, televisual or musical productions and visual presentations.

General definitions, continued

6.2.2 EN 55032, AS/NZS CISPR 32, and CISPR 32 – Port type

FAR	Fully Anechoic Room
FSOATS	Free Space Open Area Test Site
OATS	Open Area Test Site
SAC	Semi Anechoic Chamber
AC mains power port	Port used to connect to the mains supply network – Equipment with a DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment
Antenna port	Port, other than a broadcast receiver tuner port (3.1.8), for connection of an antenna used for intentional transmission and/or reception of radiated RF energy.
Broadcast receiver tuner port	Port intended for the reception of a modulated RF signal carrying terrestrial, satellite and/or cable transmissions of audio and/or video broadcast and similar services – This port may be connected to an antenna, a cable distribution system, a VCR or similar device.
DC network power port	Port, not powered by a dedicated AC/DC power converter and not supporting communication, that connects to a DC supply network. – Equipment with a DC power port which is powered by a dedicated AC/DC power converter is considered to be AC mains powered equipment. – DC power ports supporting communications are considered to be wired networks ports, for example Ethernet ports which include Power Over Ethernet (POE).
Enclosure port	Physical boundary of the EUT through which electromagnetic fields may radiate.
Optical fibre port	Port at which an optical fibre is connected to an equipment.
RF modulator output port	Port intended to be connected to a broadcast receiver tuner port in order to transmit a signal to the broadcast receiver.
Signal/control port	Port intended for the interconnection of components of an equipment under test, or between an equipment under test and local associated equipment and used in accordance with relevant functional specifications (for example for the maximum length of cable connected to it) – Examples include RS-232, Universal Serial Bus (USB), High-Definition Multimedia Interface (HDMI), IEEE Standard 1394 ("Fire Wire")
Wired network port	Point of connection for voice, data and signaling transfers intended to interconnect widely-dispersed systems by direct connection to a single-user of multi-user communication network (for example CATV, PSTN, ISDN, xDSL, LAN and similar networks) – These ports may support screened or unscreened cables and may also carry AC or DC power where this is an integral part of the telecommunication specification.

6.2.3 Title 47: Telecommunication – Part 15-Radio Frequency devices, Subpart A – General – Digital device definitions

Digital device (Previously defined as a computing device)	An unintentional radiator (device or system) that generates and uses timing signals or pulses at a rate in excess of 9,000 pulses (cycles) per second and uses digital techniques; inclusive of telephone equipment that uses digital techniques or any device or system that generates and uses radio frequency energy for the purpose of performing data processing functions, such as electronic computations, operations, transformations, recording, filing, sorting, storage, retrieval, or transfer. A radio frequency device that is specifically subject to an emanation requirement in any other FCC Rule part or an intentional radiator subject to subpart C of this part that contains a digital device is not subject to the standards for digital devices, provided the digital device is used only to enable operation of the radio frequency device and the digital device does not control additional functions or capabilities. Note: Computer terminals and peripherals that are intended to be connected to a computer are digital devices.

General definitions, continued

6.2.4 EN 55032, AS/NZS CISPR 32, and CISPR 32 – Definitions

Information technology equipment (ITE)	Any equipment: a) Which has a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control, of data and of telecommunication messages and which may be equipped with one or more terminal ports typically operated for information transfer b) With a rated supply voltage not exceeding 600 V It includes, for example, data processing equipment, office machines, electronic business equipment and telecommunication equipment.
Telecommunications/network port	Point of connection for voice, data and signaling transfers intended to interconnect widely dispersed systems via such means as direct connection to multi-user telecommunications networks (e.g. public switched telecommunications networks (PSTN) integrated services digital networks (ISDN), x-type digital subscriber lines (xDSL), etc.), local area networks (e.g. Ethernet, Token Ring, etc.) and similar networks NOTE A port generally intended for interconnection of components of an ITE system under test (e.g. RS-232, IEEE Standard 1284 (parallel printer), Universal Serial Bus (USB), IEEE Standard 1394 ("Fire Wire"), etc.) and used in accordance with its functional specifications (e.g. for the maximum length of cable connected to it), is not considered to be a telecommunications/network port under this definition.

6.2.5 ICES-003 – Definitions

ICES	The Interference-Causing Equipment Standard (ICES) sets out limits and methods of measurement of radio frequency emissions, as well as administrative requirements for information technology equipment (ITE), including digital apparatus. This includes devices or systems that generate and/or use timing signals or pulses having a rate of at least 9 kHz and employ digital techniques for purposes such as computation, display, control, data processing and storage.

6.2.6 EN 61000-3-3 – Definitions

Voltage fluctuation	Series of changes of r.m.s voltage evaluated as a single value for each successive half-period between zero-crossings of the source voltage.
Flicker	Impression of unsteadiness of visual sensation induced by a light stimulus whose luminance or spectral distribution fluctuates with time.
Short-term flicker indicator, *P*st	The flicker severity evaluated over a short period (in minutes); *P*st = 1 is the conventional threshold of irritability.
Long-term flicker indicator, *P*lt	The flicker severity evaluated over a long period (a few hours) using successive *P*st values.

Section 7 Testing data

7.1 Radiated emissions

7.1.1 References and limits

- CISPR 32:2015/AMD1:2019: Section A.2
- AS/NZS CISPR 32:2015 AMD 1:2020: Section A.2
- EN 55032:2015/A11:2020: Section A.2
- FCC 47 CFR Part 15, Subpart B: Clause §15.109 (Test method ANSI C63.4:2014)
- ICES-003 Issue 7, October 2020: Section 3.2.2

Table 7.1-1: *Requirements for radiated emissions for Class B*

Facility	Frequency range [MHz]	Measurement		limits
		Distance [m]	Detector type/ bandwidth	[dBµV/m]
EN 55032				
OATS/SAC	30–230	3	Quasi Peak/120 kHz	40.0
	230–1000			47.0
FSOATS	1000–3000	3	CAverage/1 MHz	50.0
	3000–6000			54.0
FSOATS	1000–3000	3	Peak/1 MHz	70.0
	3000–6000			74.0
CISPR 32 / AS/NZS CISPR 32				
OATS/SAC	30–230	3	Quasi Peak/120 kHz	40.0
	230–1000			47.0
FSOATS	1000–6000	3	CAverage/1 MHz	54.0
			Peak/1 MHz	74.0
FCC Part 15 Subpart B				
OATS/SAC	30–88	3	Quasi Peak/120 kHz	40.0
	88–216			43.5
	216–960			46.0
	960–1000			54.0
FSOATS	>1000	3	Linear average/1 MHz	54.0
			Peak/1 MHz	74.0
ICES-003				
OATS/SAC	30–88	3	Quasi Peak/120 kHz	40.0
	88–216			43.5
	216–230			46.0
	230–960			47.0
	960–1000			54.0
FSOATS	>1000	3	Linear average/1 MHz	54.0
			Peak/1 MHz	74.0

Notes:
- OATS – Open Area Test Site, SAC – Semi Anechoic Chamber, FSOATS – Free Space Open Area Test Site
- Where there is a step in the applicable limit, the lower value was applied at the transition frequency.

7.1.2 Test summary

Verdict	Pass		
Test date	December 19, 2014 and January 8, 2015	Temperature	24.4 °C
Tested by	Avul Nzenza and Daniel Hynes	Air pressure	1015.1 mbar
Test location	Montreal	Relative humidity	36.6 %

7.1.3 Notes

- The spectral plots within this section are a summation of vertical and horizontal scans. The spectral plots within this section have been corrected with all relevant transducer factors.
- Where tabular data has not been provided, no emissions were observed within 10 dB of the specified limit when measured with the appropriate detector. Additionally, where less than 6 measurements per detector have been provided, fewer than 6 emissions were observed within 10 dB of the specified limit when measured with the appropriate detector.
- The spectrum was scanned from 30 MHz up to 6 GHz.

7.1.4 Setup details

Port under test	Enclosure Port
EUT power input during test	100-240 V_{AC}, 50/60 Hz
EUT setup configuration	Table top
Test facility	Semi anechoic chamber
Measuring distance	3 m
Antenna height variation	1–4 m
Turntable position	0–360°
Measurement details	A preview measurement was generated with the receiver in continuous scan or sweep mode while the EUT was rotated and the antenna adjusted to maximize radiated emission. Selected emissions detected were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/spectrum analyzer settings.

Resolution bandwidth	Measurements below 1 GHz: 120 kHz, Measurements above 1 GHz: 1 MHz
Video bandwidth	Measurements below 1 GHz: 300 kHz, Measurements above 1 GHz: 3 MHz
Detector mode	Measurements below 1 GHz: Peak (Preview), Quasi-peak (Final) Measurements above 1GHz: Peak (Preview), Peak and CAverage (Final)
Trace mode	Max Hold
Measurement time	100 ms (preview); 1000 ms (final)

Table 7.1-2: *Radiated emissions equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002532	1 year	Oct. 16/15
Flush mount turntable	Sunol	FM2022	FA002550	—	NCR
Controller	Sunol	SC104V	FA002551	—	NCR
Antenna mast	Sunol	TLT2	FA002552	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	March 20/15
Bilog antenna (20–2000 MHz)	Sunol	JB1	FA002517	1 year	Aug. 29/15
Horn antenna (1–18 GHz)	EMCO	3115	FA001451	1 year	Sept. 17/15
Pre-amplifier (0.5–18 GHz)	COM-POWER	PAM-118A	FA002561	1 year	July 9/15

Notes: NCR - no calibration required

Table 7.1-3: *Radiated emissions test software details*

Manufacturer of Software	Details
Rhode & Schwarz	EMC32, Software for EMC Measurements, Version 8.53.0

7.1.5 Test data

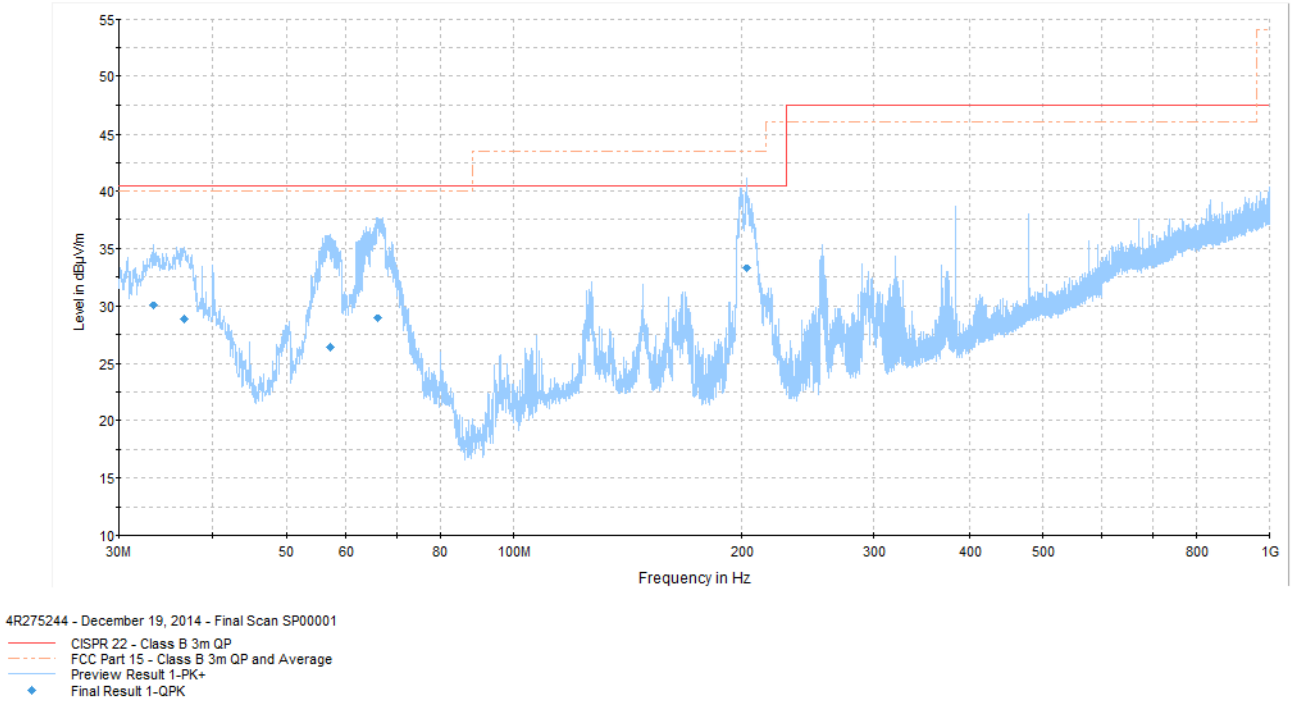

Figure 7.1-1: *Radiated emissions spectral plot (30 to 1000 MHz)*

Frequency (MHz)	Quasi-Peak field strength[1 and 3] (dBµV/m)	Quasi-Peak limit (dBµV/m)	Quasi-Peak margin (dB)	Correction factor[2] (dB)
CISPR 32, EN 55032, and AS/NZS CISPR 32				
33.39	30.1	40.0	9.9	20.4
203.61	33.3	40.0	6.7	14.3
FCC and ICES-003				
33.39	30.1	40.0	9.9	20.4
203.61	33.3	43.5	10.2	14.3

Test data continued

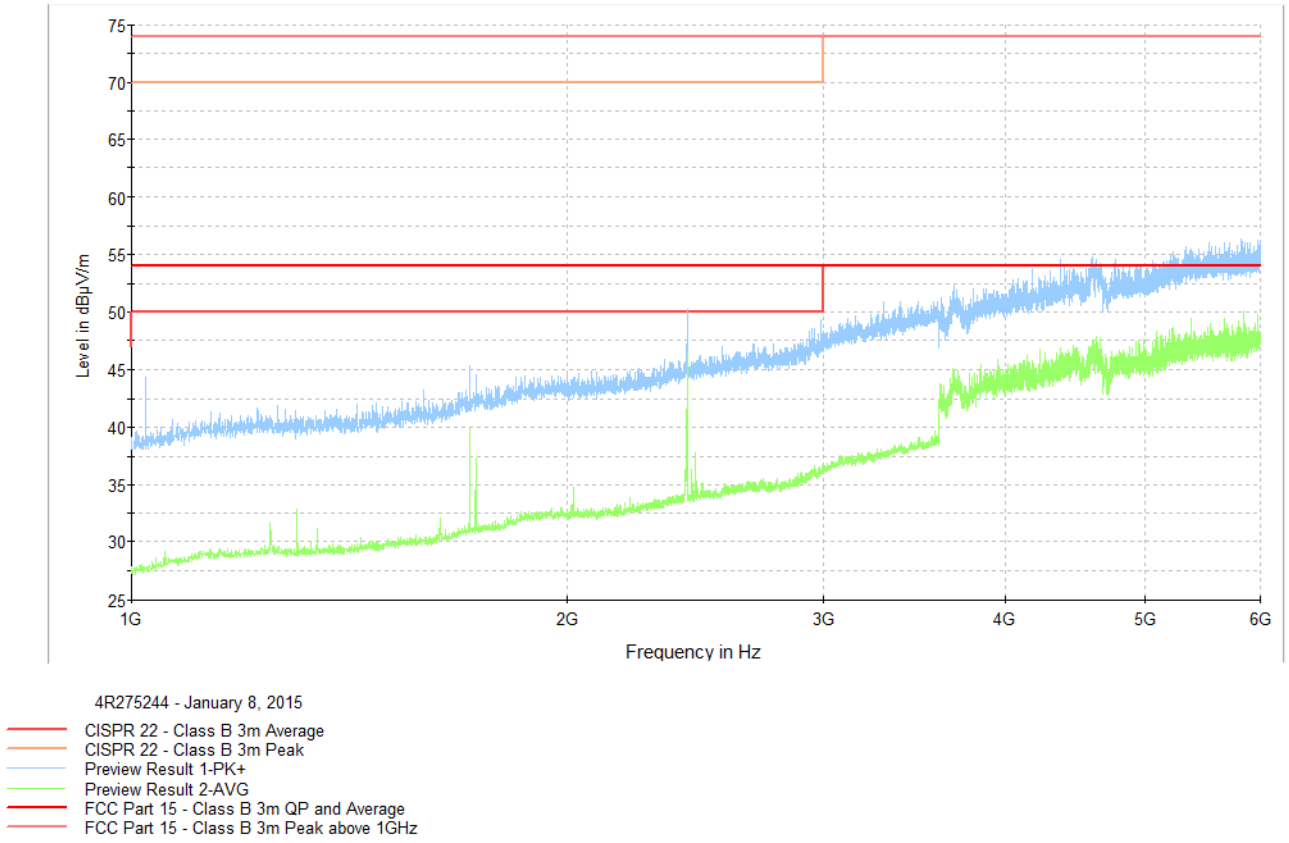

Figure 7.1-2: *Radiated emissions spectral plot (1 to 6 GHz)*

7.1.6 Setup photos

Figure 7.1-3: *Radiated emissions setup photo – below 1 GHz*

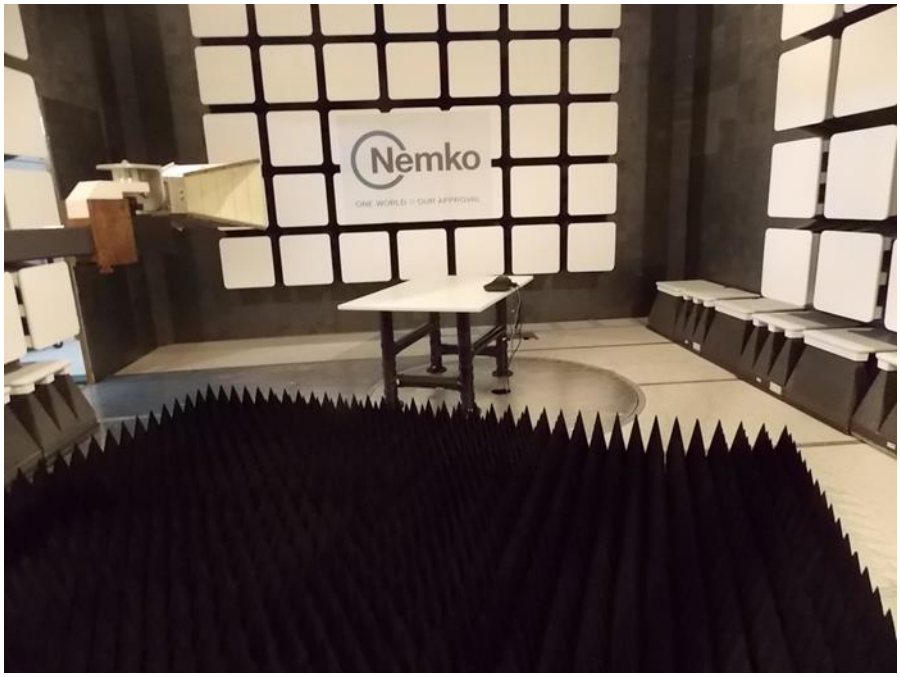

Figure 7.1-4: *Radiated emissions setup photo – above 1 GHz*

7.2 Conducted emissions – from AC mains power ports

7.2.1 References and limits

- CISPR 32:2015/AMD1:2019: Section A.3
- AS/NZS CISPR 32:2015 AMD 1:2020: Section A.3
- EN 55032:2015/A11:2020: Section A.3
- FCC 47 CFR Part 15, Subpart B: Clause §15.107
- ICES-003 Issue 7, October 2020: Section 3.2.1

Table 7.2-1: *Requirements for conducted emissions from the AC mains power ports for Class B*

Frequency range [MHz]	Measurement		Limits
	Coupling device	Detector type/ bandwidth	[dBµV]
0.15–0.5	AMN	Quasi Peak/9 kHz	66.0–56.0
0.5–5			56.0
5–30			60.0
0.15–0.5	AMN	CAverage/9 kHz	56.0–46.0
0.5–5			46.0
5–30			50.0

Notes: The lower limit shall apply at the transition frequency.

7.2.2 Test summary

Verdict	Pass		
Test date	January 6, 2015	Temperature	24.3 °C
Tested by	Daniel Hynes	Air pressure	1016 mbar
Test location	Montreal	Relative humidity	37.5 %

7.2.3 Notes

- The spectral plots within this section have been corrected with all relevant transducer factors.
- Where tabular data has not been provided, no emissions were observed within 10 dB of the specified limit when measured with the appropriate detector. Additionally, where less than 6 measurements per detector have been provided, fewer than 6 emissions were observed within 10 dB of the specified limit when measured with the appropriate detector.
- Equipment with a DC power port powered by a dedicated AC/DC power converter is considered to be AC mains powered equipment and tested with a power converter. Where the manufacturer provided the power converter, the supplied converter was used.

7.2.4 Setup details

Port under test – Coupling device	AC Mains input of AC/DC adapter – Artificial Mains Network (AMN)
EUT power input during test	100-240 V_{AC}, 50/60 Hz
EUT setup configuration	Table top
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Selected emissions detected were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver settings:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	Peak and Average (Preview), Quasi-peak and CAverage (Final)
Trace mode	Max Hold
Measurement time	100 ms (Preview), 160 ms (Final)

Table 7.2-2: *Conducted emissions – from AC mains power ports equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	March 20/15
Three phase power system	TESEQ	ProfLine 2115-400	FA002516	1 year	May 7/15
LISN	Rohde & Schwarz	ENV216	FA002515	1 year	July 14/15

Notes: All equipment related to the contribution of measurement has been included in this list. Such items include, but are not limited to, cables, attenuators, directional couplers, and pre-amps.

Table 7.2-3: *Conducted emissions – from AC mains power ports test software details*

Manufacturer of Software	Details
Rhode & Schwarz	EMC32, Software for EMC Measurements, Version 8.53.0

7.2.5 Test data

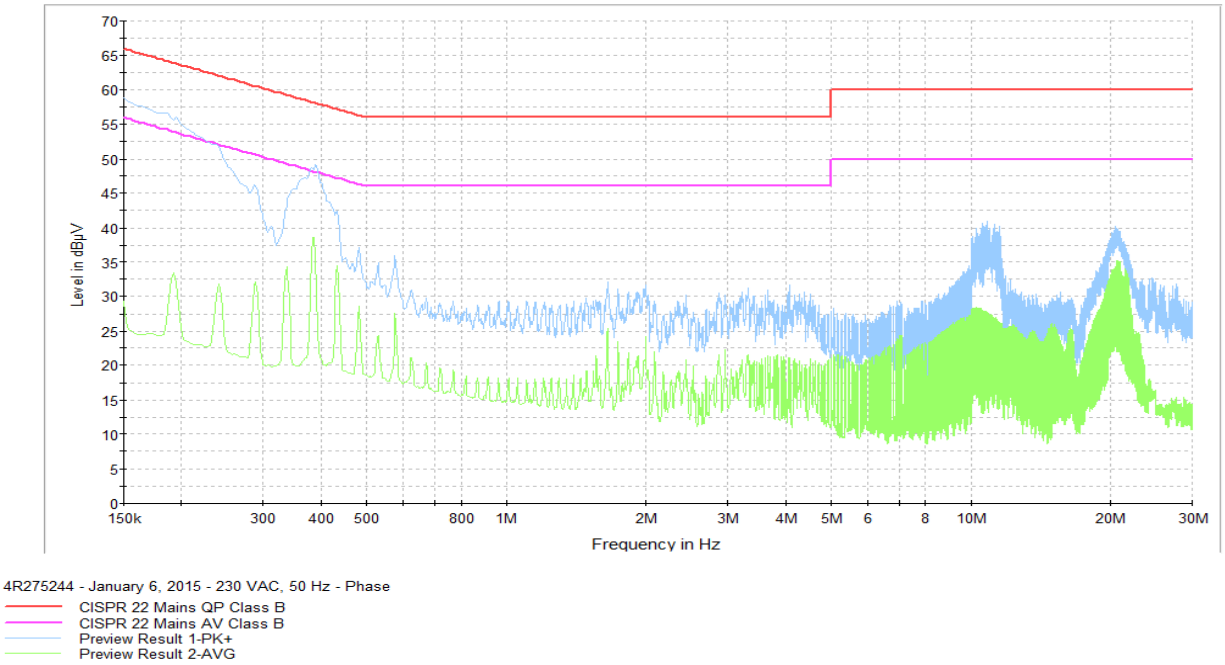

Figure 7.2-1: *Conducted emissions – from AC mains power ports spectral plot on the phase line (230 V_{AC}, 50 Hz)*

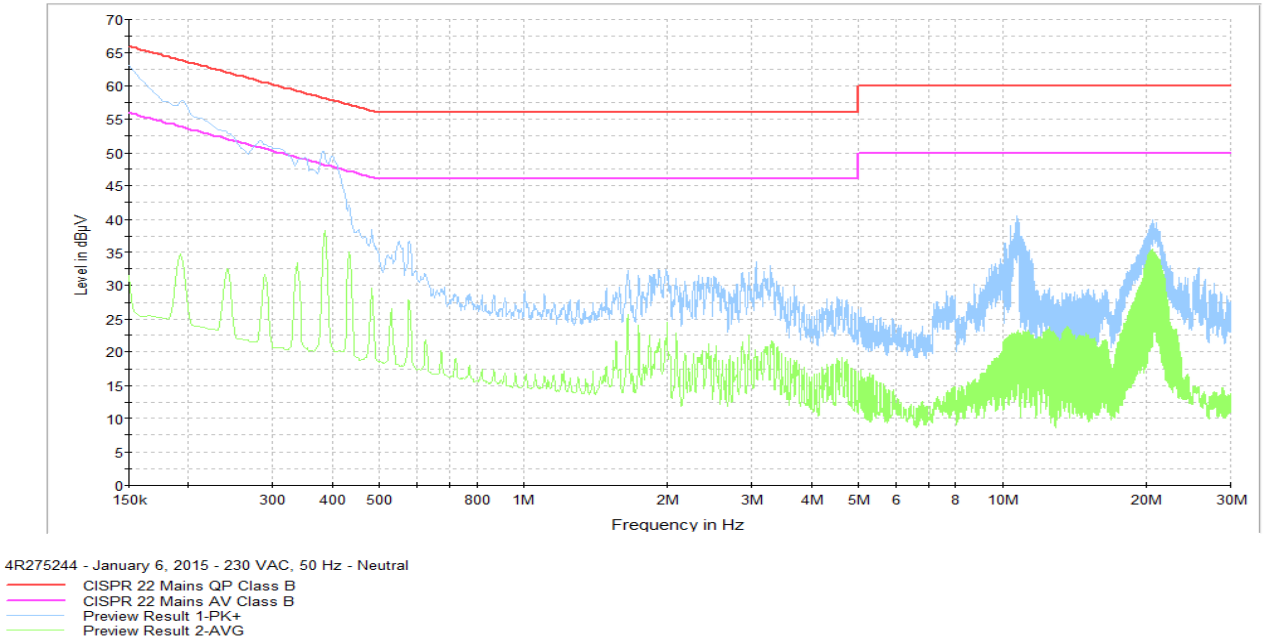

Figure 7.2-2: *Conducted emissions – from AC mains power ports spectral plot on the neutral line (230 V_{AC}, 50 Hz)*

Test data continued

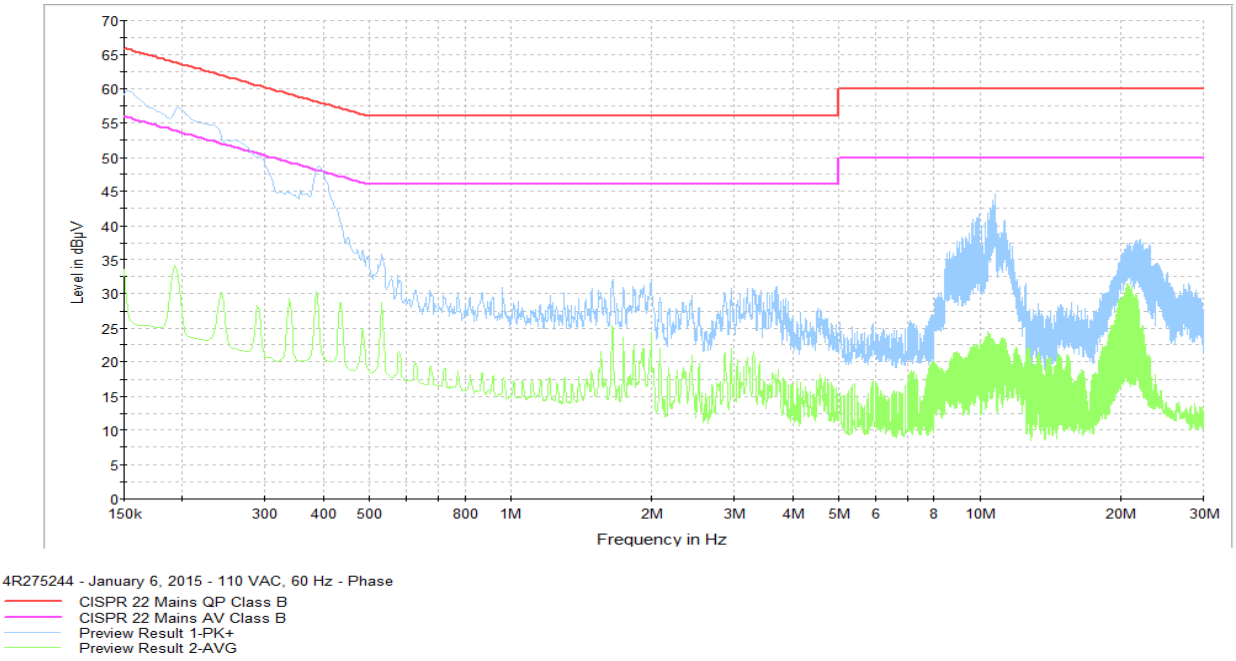

Figure 7.2-3: *Conducted emissions – from AC mains power ports spectral plot on the phase line (110 V_{AC}, 60 Hz)*

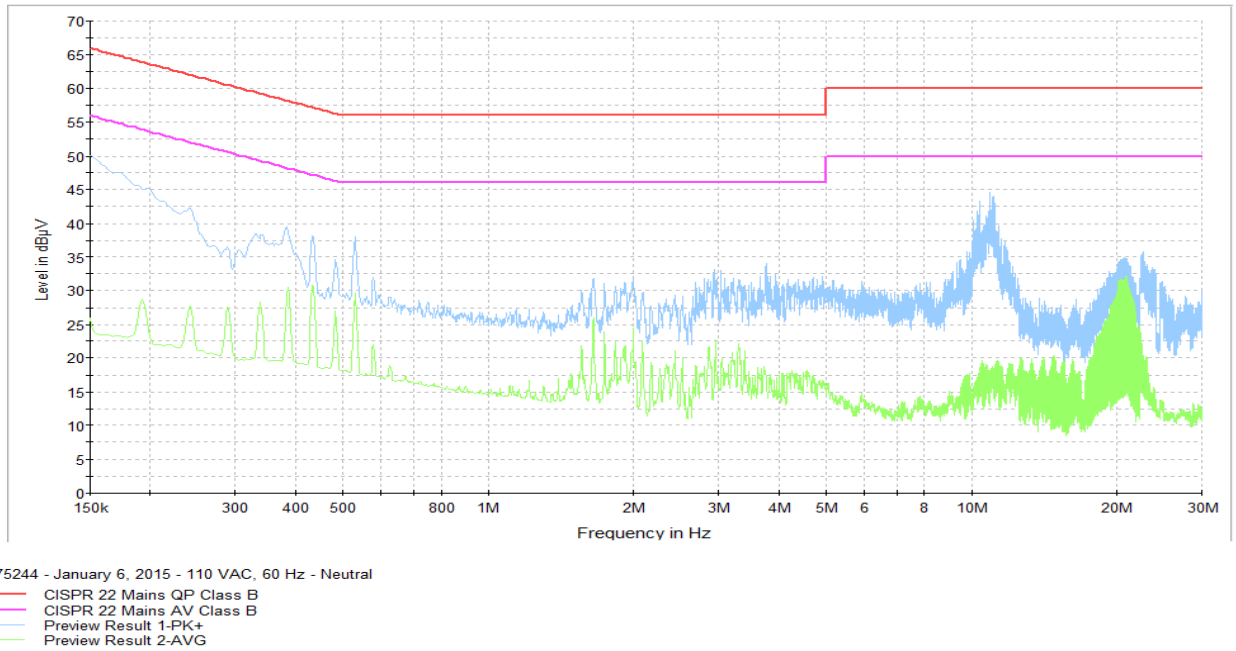

Figure 7.2-4: *Conducted emissions – from AC mains power ports spectral plot on the neutral line (110 V_{AC}, 60 Hz)*

7.2.6 Setup photos

Figure 7.2-5: *Conducted emissions – from AC mains power ports setup photo*

Figure 7.2-6: *Conducted emissions – from AC mains power ports setup photo*

Section 8 EUT photos

8.1 External photos

Figure 8.1-1: *Front view photo*

Figure 8.1-2: *Rear view photo*

External photos continued

Figure 8.1-3: *Side view photo*

Figure 8.1-4: *Side view photo*

External photos continued

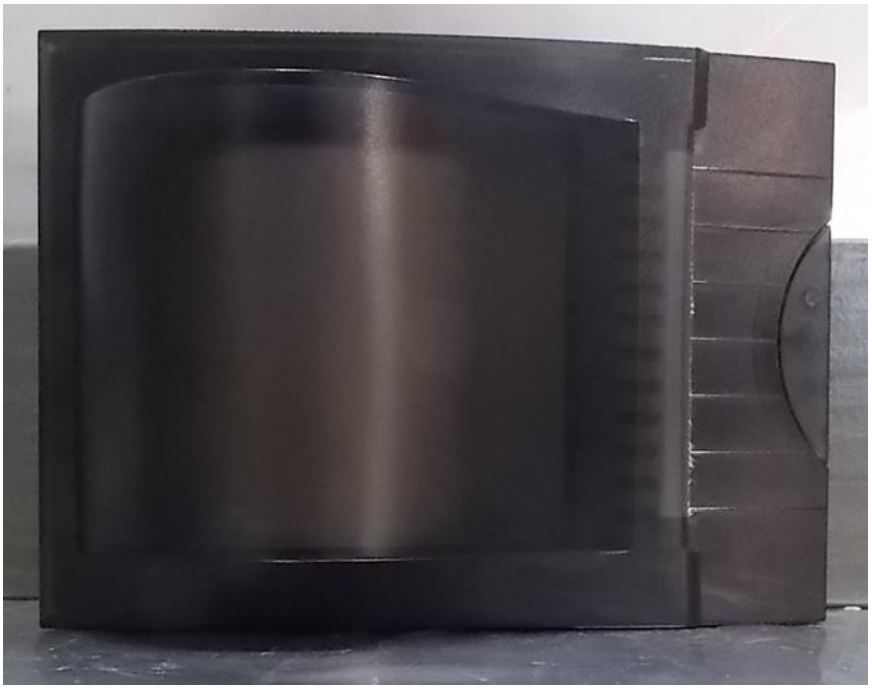

Figure 8.1-5: *Top view photo*

Figure 8.1-6: *Bottom view photo*

External photos, continued

***Figure 8.1-7**: Paper holder view photos*

End of the test report