2360

EMC Test Report

Pestwest Electronics Limited

Chameleon Sirius Trap

EFT28

EN 55014-1 2006, A1, *A2

EN 55014-2 1997, A1, A2

Test Date: 17th-18th February 2015

Report No: 02-7925-1-15 Issue 01

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Certificate of Test 7925-1

European Directive 2004/108/EC regulating electromagnetic compatibility of equipment. The unit noted below has been tested against the EMC limits of the harmonised standards listed in accordance with the conformity assessment procedure for apparatus described in Annex II. This is a certificate of test only and should not be confused with a notified body opinion. Other standards may also apply.

Equipment:	Chameleon Sirius Trap
Model Number:	EFT28
Unique Serial Number:	0325690001
Manufacturer:	Pestwest Electronics Limited 113-115 Wakefield Road Ossett West Yorkshire WF5 9AR
Full measurement results are detailed in Report Number:	02-7925-1-15 Issue 01
Test Standards:	EN 55014-1: 2006, A1, *A2 EN 55014-2: 1997, A1, A2 Category 2 ↳ EN 61000-4-2: 2009 ↳ EN 61000-4-4: *2012 ↳ EN 61000-4-5: 2006 ↳ EN 61000-4-6: 2009 ↳ EN 61000-4-11: 2004

NOTE:
Certain tests were not performed based upon manufacturer's declarations. For details refer to section 3 of this report.

DEVIATIONS:
Deviations from the standards have been applied. For details refer to section 4.2 of this report.

This certificate relates only to the unit tested as identified by a unique serial number and in the condition at the time it was tested. It does not relate to any other similar equipment and performance of the product before or after the test cannot be guaranteed. Whilst every effort is made to assure quality of testing, type tests are not exhaustive and although no non-conformances may be found, this doesn't exclude the possibility of unit not meeting the intentions of the standard or the requirements of the Directive, particularly under different conditions to those during testing. Any compliance statements are made reliant on the modes of operation as instructed to us by the manufacturer based on their specific knowledge of the application and functionality of the unit tested. Statements of compliance, where measurements were made, do not include the measurement uncertainty. The measurement uncertainty, where stated, is the expanded uncertainty based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Date of Test: 17th-18th February 2015

Test Engineer: Digitally signed by: Bradley Johns DN: CN = Bradley Johns C = GB O = RN Electronics Date: 2015.03.16 14:20:35 Z

Approved By:
Technical Director

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1 Contents

2 Equipment Under Test (EUT)

2.1 Equipment specification

Manufacturer	Pestwest Electronics Limited 113-115 Wakefield Road Ossett West Yorkshire WF5 9AR	
Full Name	Chameleon Sirius Trap	
Model Number	EFT28	
Serial Number	0325690001	
Date Received by RN Electronics Limited	17th February 2015	
Date of Test	17th-18th February 2015	
Purpose of Test	To demonstrate compliance to the harmonised standards of the EMC Directive.	
Date Report Printed	16 March 2015	
Visual Description	The EUT is a ceiling mounted fly killer. The EUT is a metallic square enclosure housing a rocker switch and 2 x 14 Watt UVA Fluorescent tubes.	
Main Function	Electronic Fly Trap.	
Information Specification	Height	190 mm
	Width	582 mm
	Depth	120 mm
	Weight	2.7 kg
	Voltage	220-240 V AC 50/60Hz
	Current	150 mA
	Highest frequency used or tuned	43 kHz

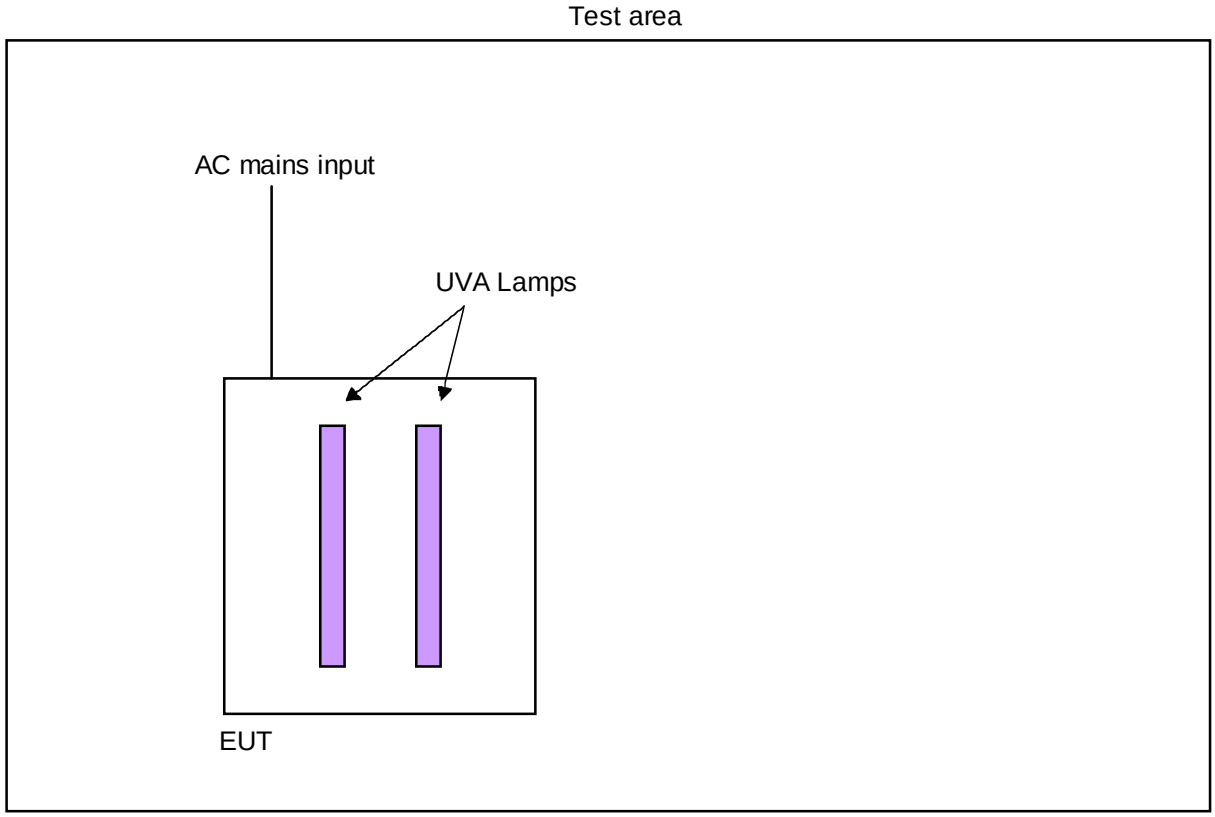
2.2 Functional Description

Electronic fly killer incorporating 2 x14W fluorescent UVA (368NM) tubes to attract flying insects.

2.3 Modes of operation

Mode Reference	Description
On	The EUT is powered. The electronic ballast has fired and the 2 x UVA tubes are illuminated.

2.4 Emissions configuration



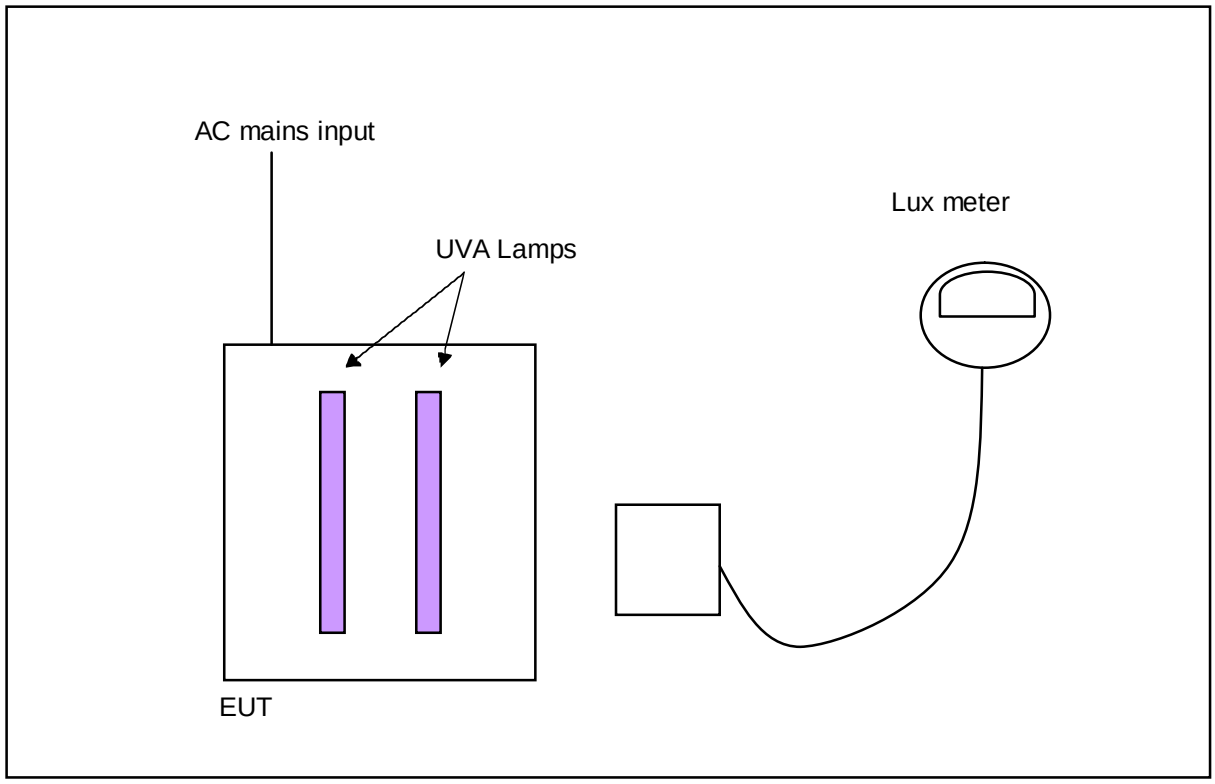
The equipment under tests supply voltage was varied over a range of 198 to 264 VAC and measurements were made at the worst case voltage. No discernible difference was noted from varying the voltage. The electronic ballast was active. The EUTs 2 x14 W Fluorescent UVA tubes were illuminated.

2.4.1 Mains terminal disturbance voltages & Disturbance power

Port Name	Cable Type	Connected
Mains	3 Core	Yes

2.5 Immunity configuration and performance

Test area



For immunity tests, the same configuration was used as for emissions testing. The electronic ballast was active. The EUTs 2 x 14W Fluorescent UVA tubes were monitored via a LUX meter to ensure they continued to function correctly at the same intensity.

2.5.1 Injected currents, 0.15 MHz to 230 MHz
Fast transients
Surges
Voltage dips and interruptions
Electrostatic discharge

Port Name	Cable Type	Connected
Mains	3 Core	Yes

3 Summary of test results

The EUT was tested to the following standards:

EN 55014-1 2006, A1, *A2
EN 55014-2 1997, A1, A2 Category 2

Any compliance statements are made reliant on the modes of operation and the failure criteria as instructed to us by the Manufacturer based on their specific knowledge of the application and functionality of the equipment tested. Whilst every effort is made to assure quality of testing, type tests are not exhaustive and although no non-conformances may be found, this doesn't exclude the possibility of equipment not meeting the intentions of the standard or the essential requirements of the directive, particularly under different conditions to those during testing. Statements of compliance, where measurements were made, do not include the measurement uncertainty.

Title	Reference	Results
	Emissions	
1. Mains terminal disturbance voltages	EN 55014-1 Household and similar appliances	 PASSED
2. Load terminal disturbance voltages	EN 55014-1	NOT APPLICABLE[1]
3. Disturbance power	EN 55014-1 Household and similar appliances	 PASSED
4. Radiated disturbances	EN 55016-2-3	NOT APPLICABLE[2]
5. Discontinuous disturbance	EN 55014-1	NOT APPLICABLE[3]
	Immunity	
6. Radio frequency electromagnetic fields, 80MHz to 1000MHz	EN 61000-4-3	 NOT APPLICABLE[4]
7. Injected currents, 0.15 MHz to 230 MHz	EN 61000-4-6 150kHz – 230MHz 80% AM AC power 3Vrms DC power Signal and control lines	 PASSED NOT APPLICABLE[1] NOT APPLICABLE[5]
8. Fast transients	EN 61000-4-4 AC power ±1kV DC power Signal and control lines	 PASSED NOT APPLICABLE[1] NOT APPLICABLE[5]
9. Voltage dips and interruptions	EN 61000-4-11 100% reduction 10ms 60% reduction 200ms 30% reduction 500ms	PASSED PASSED PASSED
10. Surges	EN 61000-4-5 AC power ±1kV L-L; ±2kV L-E	 PASSED
11. Electrostatic discharge	EN 61000-4-2 ±8kV Air ±4kV Contact	PASSED PASSED

1. The EUT has no such port.
2. Appliance was deemed to comply in the frequency range from 300 to 1000 MHz as the manufacturer declares all clock frequencies less than 30MHz and all emission readings from EUT passed disturbance power 200 – 300 MHz by more than the designated margin (10dB QP).
3. Test not required as clicks were not observed.
4. The EUT was deemed by Pestwest Electronics Limited to be Category 2 equipment and therefore this test is not required.
5. Manufacturer declares no signal or control lines greater than 3m.

3.1 Electromagnetic Environment

The apparatus covered by this standard is subdivided into categories. For each category, specific requirements are formulated.

Category I: Apparatus containing no electronic control circuitry.

Examples: motor operated appliances, lighting toys, track sets without electronic control units, tools, heating appliances, UV and IR radiators and apparatus containing components such as electromechanical switches and thermostats.

Electric circuits consisting of passive components (such as radio interference suppression capacitors or inductors, mains transformers and mains frequency rectifiers) are not considered to be electronic control circuitry.

Category II: Transformer toys, dual supply toys, mains powered motor operated appliances, tools, heating appliances and similar electric apparatus (for example — UV radiators, IR radiators and microwave ovens) containing electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

Category III: Battery powered apparatus (with built-in batteries or external batteries), which in normal use is not connected to the mains, containing an electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.
This category includes apparatus provided with rechargeable batteries which can be charged by connecting the apparatus to the mains power. However, this apparatus shall also be tested as an apparatus in Category II while it is connected to the mains network.

Category IV: All other apparatus covered by the scope of this standard.

The Chameleon Sirius Trap EFT28 was deemed by Pestwest Electronics Ltd to be tested under **Category 2 of EN 55014-2 1997, A1, A2.**

4 Specifications

The tests were performed and operated in accordance with the RN Electronics procedures and the basic standards listed below.

4.1 Relevant standards

Reference	Standard Number	Year	Description
4.1.1	EN 55014-1 AMD 1 AMD 2*	2006 2009 2011	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus Part 1: Emission
4.1.2	EN 55016-2-3	2006	Specification for radio disturbance and immunity measuring apparatus and methods Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements
4.1.3	RESERVED	-	-
4.1.4	RESERVED	-	-
4.1.5	RESERVED	-	-
4.1.6	EN 55014-2 AMD 1 AMD 2	1997 2001 2008	Electromagnetic compatibility — Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity — Product family standard.
4.1.7	EN 61000-4-2	2009	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
4.1.8	RESERVED	-	-
4.1.9	EN 61000-4-4	*2012	Electromagnetic compatibility (EMC) Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
4.1.10	EN 61000-4-5	2006	Electromagnetic compatibility (EMC) Part 4-5: Testing and measurement techniques - Surge immunity test
4.1.11	EN 61000-4-6	2009	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
4.1.12	RESERVED	-	-
4.1.13	EN 61000-4-11	2004	Electromagnetic Compatibility (EMC) Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests

4.2 Deviations

4.2.1 Deviations from EN 55014-1.

Results of continuous disturbances are taken from a continuous maximised sweep of the full spectrum required by the standard. Therefore only the maximum disturbances (at least six signals) are recorded individually, not the specific frequencies listed in 7.4.1.3 – 7.4.1.5 of EN 55014-1. The purpose of this testing is to prove the type, not to make direct comparison of production samples.

4.2.2 Referenced standard deviations

EN 61000-4-2: 2009 version applied instead of date referenced 1995, A1, A2 version.
EN 61000-4-4: 2012 applied instead of date referenced version.
EN 61000-4-6: 2009 version applied instead of date referenced 2007 version.

5 Tests, methods and results

5.1 Mains terminal disturbance voltages

5.1.1 Test Methods

Test Requirements : EN 55014-1, Reference 4.1.1

Test Method : EN 55014-1, Reference 4.1.1

5.1.2 Configuration of EUT

The EUT was placed on a wooden table 0.8m above the ground plane and connected to a LISN via a 1m mains cable.

Refer to section 9.2 for a photograph of this test set-up.

Details of the peripheral and ancillary equipment connected for this test is listed in section 11.

The EUT was operated in **On** mode, which was the only operational mode available.

5.1.3 Test Procedure

The supply voltage was varied over a range of 198 to 264 VAC and measurements were made at the worst case voltage noted below. Measurements were made via a LISN on the live and neutral conductors using both average and quasi-peak detectors.

At least 6 signals within 10dB of the limit were investigated.

Tests were performed in Test Site F.

5.1.4 Test Equipment Used

E150, E198, E533, E534, E535

See Section 10 for more details

5.1.5 Test Results

Temperature of test environment:	23°C
Relative humidity of test environment:	34%
Mains voltage supplied:	230V AC

Receiver plots showing peak values can be found in Section 7.1 of this report along with tables of peak / quasi-peak and peak / average values.

These results show that the EUT has **PASSED** this test.

The uncertainty gives a 95% confidence interval in which the emissions from the EUT fall. Expanded uncertainty (K=2) is as follows, which is within the CISPR uncertainty budget:

150kHz to 30MHz ±3.6dB

5.2 Load terminal disturbance voltages

NOT APPLICABLE: The EUT has no such port.

5.3 Disturbance power

5.3.1 Test Methods

Test Requirements : EN 55014-1, Reference 4.1.1

Test Method : EN 55014-1, Reference 4.1.1

5.3.2 Configuration of EUT

The EUT was placed on a wooden table 0.8 m above the ground plane. All leads under test were extended to 6 metres in length to enable an absorbing clamp to measure the maximum emissions over the test frequency range.

Refer to section 9.3 for a photograph of this test set-up.

Details of the peripheral and ancillary equipment connected for this test is listed in section 11.

The EUT was operated in **On** mode, which was the only operational mode available.

5.3.3 Test Procedure

The absorbing clamp was moved along the lead under test to ascertain the position of the worst emissions at each test frequency.

The supply voltage was varied over a range of 198 to 264 VAC and measurements were made at the worst case voltage noted below.

At least 6 signals within 10dB of the limit were investigated.

5.3.4 Test Equipment Used

TMS947, E368, E533, E534, E535

See Section 10 for more details

5.3.5 Test Results

Test Site:	M
Temperature of test environment (chamber):	22°C
Relative humidity of test environment (chamber):	34%
Mains voltage supplied:	230V AC

Receiver plots showing peak values can be found in Section 7.2 of this report along with tables of quasi-peak and average values.

These show that the EUT has **PASSED** this test.

The uncertainty gives a 95% confidence interval in which the emissions from the EUT fall. Expanded uncertainty (K=2) is as follows:

30MHz - 300MHz ±4.4dB

5.4 Radiated disturbances

NOT APPLICABLE: Appliances was deemed to comply in the frequency range from 300 to 1000 MHz as manufacturer declares all clock frequencies less than 30MHz and all emission readings from EUT passed disturbance power 200 – 300 MHz by more than the designated margin (10dB QP).

5.5 Discontinuous disturbance

NOT APPLICABLE: Test not required as clicks were not observed.

5.6 Radio frequency electromagnetic fields, 80MHz to 1000MHz

NOT APPLICABLE: The EUT was deemed by Pestwest Electronics Limited to be Category 2 equipment and therefore this test is not required.

5.7 Injected currents, 0.15 MHz to 230 MHz

5.7.1 Test Methods

Test Requirements : EN 55014-2, Reference 4.1.6

Test Method : EN 61000-4-6, Reference 4.1.11

5.7.2 Configuration of EUT

The EUT and signal leads were placed on 100mm high Styrofoam blocks above a ground plane. Any specific operating conditions or configurations have been listed in section 2.

The EUT was tested in **On** mode.

Details of the peripheral and ancillary equipment connected for this test is listed in section 11.

5.7.3 Test Procedure

The mains AC input was powered via a Coupling and Decoupling Network (CDN). The AC Mains lead was subjected to 3Vrms + 80% AM modulation @ 1kHz over the frequency range 150kHz to 230MHz.

Tests were performed using a stepped run of 1% frequency increments with a dwell time of 1 second in order to ensure the EUT continued to operate as intended and had time to respond to the subjected field.

Performance level defined by the customer was: The EUTs UVA tubes shall not flicker or show any signs of degradation.

The EUT was monitored for performance criteria **A in section 6** by: CCTV viewing a LUX meter next to the UVA tubes.

Tests were performed in Test Site D.

5.7.4 Test Equipment Used

E083, E274, E391, E394, E395, E476, TMS33, E531

See Section 10 for more details

5.7.5 Test Results

Temperature of test environment: 18°C
Relative humidity of test environment: 38%
Atmospheric pressure of test environment: 103kPa

Port Name	Connected	Tested	Reason	Result
Mains	Yes	Yes	Required by specification	PASSED

Observed effects during the test were: The LUX meter reading remained constant.

Observed effects after the test were: The LUX meter reading remained constant.

The EUT met Criterion 1 in the specific performance criteria (see section 6) and has therefore **PASSED** this test.

It has been demonstrated that the applied field meets the specified requirements in the standard and a 95% confidence interval for the uncertainty of applied stress calculated.

\# Performance is based on the customer's requirements per the reference standard. Measurements of the customer's requirements are not covered by RN Electronics UKAS accreditation.

5.8 Fast transients

5.8.1 Test Methods

Test Requirements : EN 55014-2, Reference 4.1.6

Test Method : EN 61000-4-4, Reference 4.1.9

5.8.2 Configuration of EUT

The EUT was placed 100mm above a horizontal ground plane. To test the AC input a 0.5m mains lead was used to connect the transient generator to the EUT. All leads were kept at least 100mm above the ground plane by means of styrofoam blocks.

The EUT was tested in **On** mode with the configuration of leads as required by the standard - refer to section 2.

Details of the peripheral and ancillary equipment connected for this test is listed in section 11.

5.8.3 Test Procedure

The EUT was subjected to both positive and negative pulses of 0.5kV and 1kV on the AC power line with a repetition rate of 5 kHz for a duration of 2 minutes for each polarity.

Performance level defined by the customer was: The EUTs UVA tubes shall not flicker or show any signs of degradation.

The EUT was monitored for performance criteria **B in section 6** by: Viewing a LUX meter next to the UVA tubes.

Tests were performed in Test Site C.

5.8.4 Test Equipment used

TMS942

See Section 10 for more details

5.8.5 Test Results

Temperature of test environment : 17°C
Relative humidity of test environment : 36%
Atmospheric pressure of test environment : 103kPa
Mains voltage supplied : 241.2 V AC

Port Name	Connected	Tested	Reason	Result
Mains	Yes	Yes	Required by specification	PASSED

Observed effects during the test were: The LUX meter reading remained constant.

Observed effects after the test were: The LUX meter reading remained constant.

The EUT met Criterion 1 in the specific performance criteria (see section 6) and has therefore **PASSED** this test.

It has been demonstrated that the burst generator meets the specified requirements in the standard and a 95% confidence interval for the uncertainty of applied stress calculated.

Performance is based on the customer's requirements per the reference standard. Measurements of the customer's requirements are not covered by RN Electronics UKAS accreditation.

5.9 Voltage dips and interruptions

5.9.1 Test Methods

Test Requirements : EN 55014-2, Reference 4.1.6

Test Method : EN 61000-4-11, Reference 4.1.12

5.9.2 Configuration of EUT

The EUT was placed on a wooden table and connected to a dip generator via the manufacturer's presented mains cable. The EUT was tested in **On** mode with the configuration of leads as required by the standard - refer to section 2.

Details of the Peripheral and Ancillary Equipment connected for this test is listed in section 11.

5.9.3 Test Procedure

The EUT was supplied with the nominal mains voltage and subjected to the following dip tests; each being applied three times at 10s intervals:

a) 100% reduction in mains supply for 10ms at both 0° and 180°,
b) 60% reduction for 200ms
c) 30% reduction for 500ms
The EUT was monitored for performance criteria **C in section 6**.

Voltage Dips performance level defined by the customer was: The EUTs UVA tubes are allowed to flicker. The EUT must remain powered.

Method of monitoring: Viewing a LUX meter next to the UVA tubes.

Tests were performed in Test Site C.

5.9.4 Test Equipment Used

TMS942

See Section 10 for more details

5.9.5 Test Results

Temperature of test environment	: 22°C
Relative Humidity of test environment	: 34%
Atmospheric Pressure of test environment	: 101kPa
Mains voltage supplied	: 235.2 V AC

Voltage dips results:
Observed effects during the test were: The EUTs UVA tubes flickered. The rocker switch remained illuminated.

Observed effects after the test were: The UVA tubes Illuminated.

The EUT met Criterion 2 in the specific performance criteria (see section 6) and has therefore **PASSED** this test.

It has been demonstrated that the dip simulator meets the specified requirements in the standard and a 95% confidence interval for the uncertainty of applied stress calculated.

Performance is based on the customer's requirements per the reference standard. Measurements of the customer's requirements are not covered by RN Electronics UKAS accreditation.

5.10 Surges

5.10.1 Test Methods

Test Requirements : EN 55014-2, Reference 4.1.6

Test Method : EN 61000-4-5, Reference 4.1.10

5.10.2 Configuration of EUT

The EUT was placed on a 0.8m high wooden bench and connected to a surge generator via a 2m mains cable.

The EUT was tested in **On** mode with the configuration of leads as required by the standard - refer to section 2.

Details of the peripheral and ancillary equipment connected for this test is listed in section 11.

5.10.3 Test Procedure

The EUT AC supply input was subjected to surges at up to 60 second intervals. Five positive and five negative surges were applied at each combination of phase angle and level. Phase angles used were 90 degrees for positive pulses and 270 degrees for negative pulses. Levels used were 1kV line to line and 2kV line to earth. The generator line impedance was 2ohm, except for the 2kV line to earth surge pulses which was 12ohm.

Performance level defined by the customer was: The EUTs UVA tubes are allowed to flicker. The EUT must remain powered.

The EUT was monitored for performance criteria **B in section 6** by: Viewing a LUX meter next to the UVA tubes.

Tests were performed in Test Site C.

5.10.4 Test Equipment Used

TMS942

See Section 10 for more details

5.10.5 Test Results

Temperature of test environment : 17°C
Relative humidity of test environment : 37%
Atmospheric pressure of test environment : 100kPa
Mains voltage supplied : 235.2 VAC

Port Name	Connected	Tested	Reason	Result
Mains	Yes	Yes	Required by specification	PASSED

Mains port surges

Line	No. of surges	Level (V)	Angle	Result
Live to Neutral	5 +ve	1000	90°	PASSED
Live to Neutral	5 -ve	1000	270°	PASSED
Live to Earth	5 +ve	2000	90°	PASSED
Live to Earth	5 -ve	2000	270°	PASSED
Neutral to Earth	5 +ve	2000	90°	PASSED
Neutral to Earth	5 -ve	2000	270°	PASSED

Observed effects during the test were: The EUTs UVA tubes flickered on event.

Observed effects after the test were: The LUX meter reading returned to its original value.

The EUT met Criterion 2 in the specific performance criteria (see section 6) and has therefore **PASSED** this test.

It has been demonstrated that the surge generator meets the specified requirements in the standard and a 95% confidence interval for the uncertainty of applied stress calculated.

Performance is based on the customer's requirements per the reference standard. Measurements of the customer's requirements are not covered by RN Electronics UKAS accreditation.

5.11 Electrostatic discharge

5.11.1 Test Methods

Test Requirements : EN 55014-2, Reference 4.1.6

Test Method : EN 61000-4-2, Reference 4.1.7

5.11.2 Configuration of EUT

The EUT was placed on a 0.5mm thick insulated sheet over a horizontal coupling plane 1.6m by 0.8m, this being mounted on a 0.8m high wooden bench. The EUT was positioned 0.1m from the front edge of the coupling plane.

The EUT was tested in **On** mode with the configuration of leads as required by the standard - refer to section 2.

Details of the peripheral and ancillary equipment connected for this test is listed in section 11.

5.11.3 Test Procedure

AIR DISCHARGE
Potentials of 2kV and 4kV were initially applied to each applicable test point in both positive and negative polarities. The severity level was increased to 8kV. The full discharge level was then applied a minimum of 20 times to each test point where a discharge had occurred; 10 positive and 10 negative discharges.

CONTACT DISCHARGE
Potentials of 2kV were initially applied to all user accessible conductive surfaces (test points) in both positive and negative polarities. The severity level was increased to 4kV. The full discharge level was then applied a minimum of 20 times to each test point where a discharge had occurred; 10 positive and 10 negative discharges.
A Vertical Coupling Plane (VCP) was positioned on top of the Horizontal Coupling Plane (HCP), 0.1m from the EUT. Each side of the EUT was subjected to 20 VCP discharges of 4kV; 10 of positive and 10 of negative polarity. The EUT was turned through all planes such that each face in turn was positioned 0.1 m from the VCP.
The base of the EUT was then subjected to at least 20 HCP discharges of 4kV; 10 of positive and 10 of negative polarity.

The interval between all discharges was a minimum of 1 second.

Performance level defined by the customer was: The EUTs UVA tubes shall not flicker or show any signs of degradation.

The EUT was monitored for performance criteria **B in section 6** by: Viewing a LUX meter next to the UVA tubes.

Tests were performed in Test Site C.

5.11.4 Test Equipment Used

TMS942, TMS943

See Section 10 for more details

5.11.5 Test Results

Temperature of test environment : 21°C
Relative Humidity of test environment : 36%
Atmospheric Pressure of test environment : 101kPa

Observed effects during the test were: The LUX meter reading remained constant.

Observed effects after the test were: The LUX meter reading remained constant.

The EUT met Criterion 1 in the specific performance criteria (see section 6) and has therefore **PASSED** this test.

It has been demonstrated that the ESD simulator meets the specified requirements in the standard and a 95% confidence interval for the uncertainty of applied stress calculated.

Performance is based on the customer's requirements per the reference standard. Measurements of the customer's requirements are not covered by RN Electronics UKAS accreditation.

6 Performance criteria

A functional description and a definition of performance criteria, during or as a consequence of the EMC testing, shall be provided by the manufacturer and noted in the test report, based on the following criteria.

6.1 Performance criterion A

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

6.2 Performance criterion B

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

6.3 Performance criterion C

Temporary loss of function is allowed, provided the function is self- recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

The following Table 14 serves as a guide to formulate the permissible degradation of the equipment under test (EUT) caused by electromagnetic stress. Not all functions of the apparatus need to be tested. The selection, the specification of functions, and the permissible degradation is left to the responsibility of the manufacturer.

Table 14 – Examples of degradations

Functions (non-exhaustive)	**Criteria**			
	A	B [2]	C1 [3]	C2 [3]
Motor speed	10% [1]	-	+	-
Torque	10% [1]	-	+	-
Movement	10% [1]	-	+	-
Power (consumption, input)	10% [1]	-	+	-
Switching (change of state)	-	-	+	-
Heating	10% [1]	-	+	-
Timing (programme, delay, duty cycle)	10% [1]	-	+	-
Stand-by	-	-	[4]	-
Data storage	-	-	[5]	[5]
Sensor functions (signal transmission)	[6]	-	[7]	-
Indicators (visual and acoustic)	[6]	-	[7]	-
Audio function	[6]	-	[7]	-
Illumination	[6]	-	[7]	-

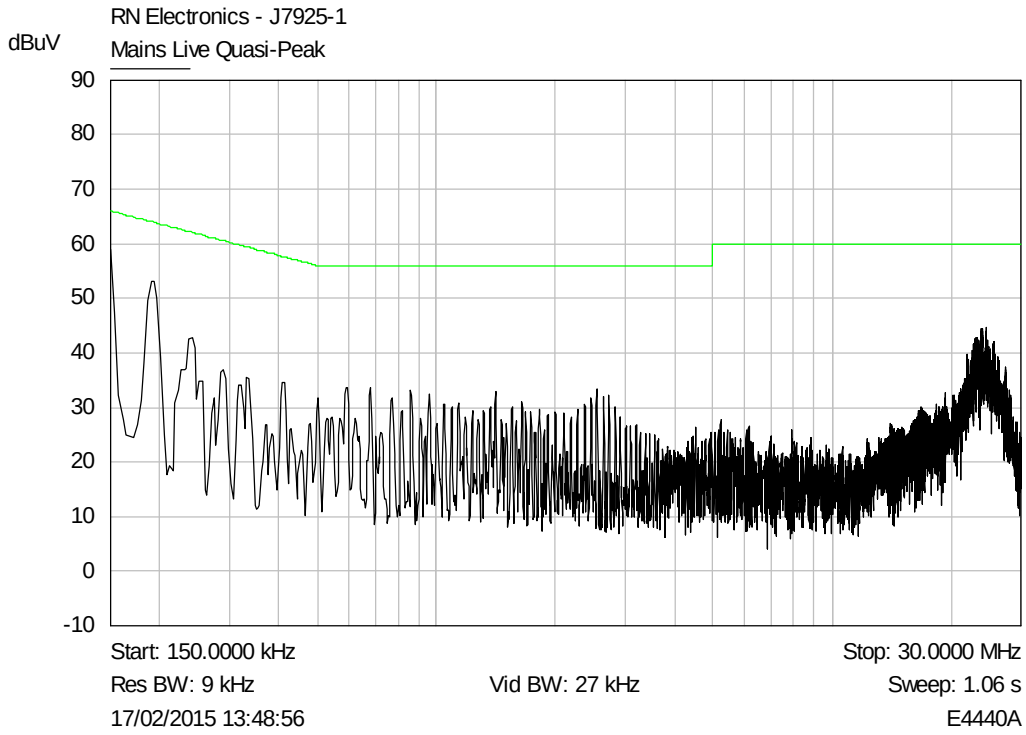
- No change allowed
+ Change allowed
1) Values are exclusive of the measurement accuracy.
2) For criterion B, measurement or verification is performed during the stable operations of the Equipment Under Test before and after the application of the specified phenomenon.
3) For criterion C, distinction is made between
C1: before resetting and
C2: after resetting.
4) Switching-off is allowed, switching-on is not allowed.
5) Loss or change of data is allowed.
6) Lower performance as specified by the manufacturer is allowed, but no loss of correct function.
7) Loss of correct functions allowed.

6.4 Specific performance criteria applied to Chameleon Sirius Trap

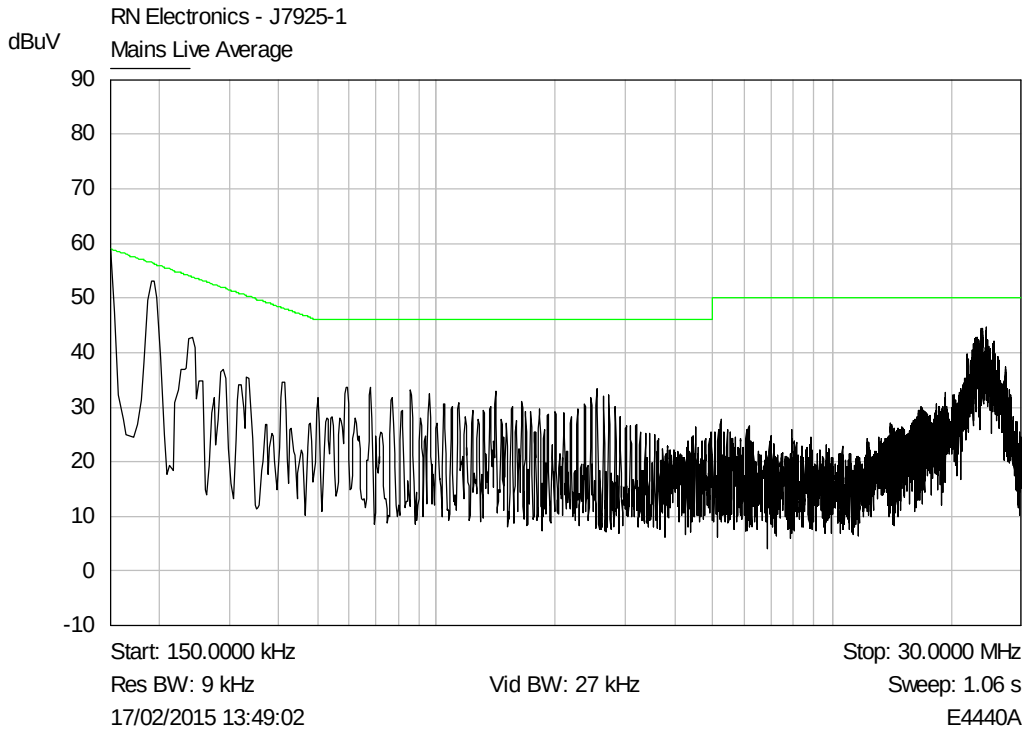
Criteria	Relating to Standard Criteria	Description
Criterion 1	Criteria A	The EUTs UVA tubes shall not flicker or show any signs of degradation.
Criterion 2	Criteria B	The EUTs UVA tubes are allowed to flicker. The EUT must remain powered.

7 Graphical results

7.1 Mains Terminal Voltage Emissions Plots



Plot of peak emissions 150kHz - 30MHz on the Mains live terminal against the quasi-peak limit line.

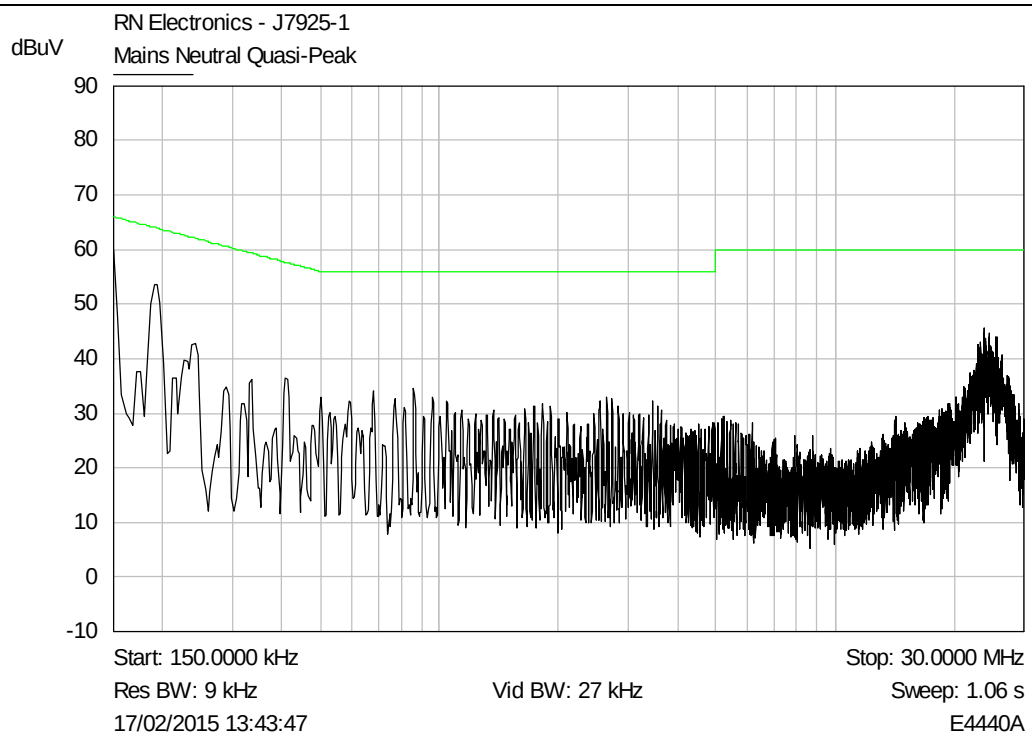


Plot of peak emissions 150kHz - 30MHz on the Mains live terminal against the average limit line.

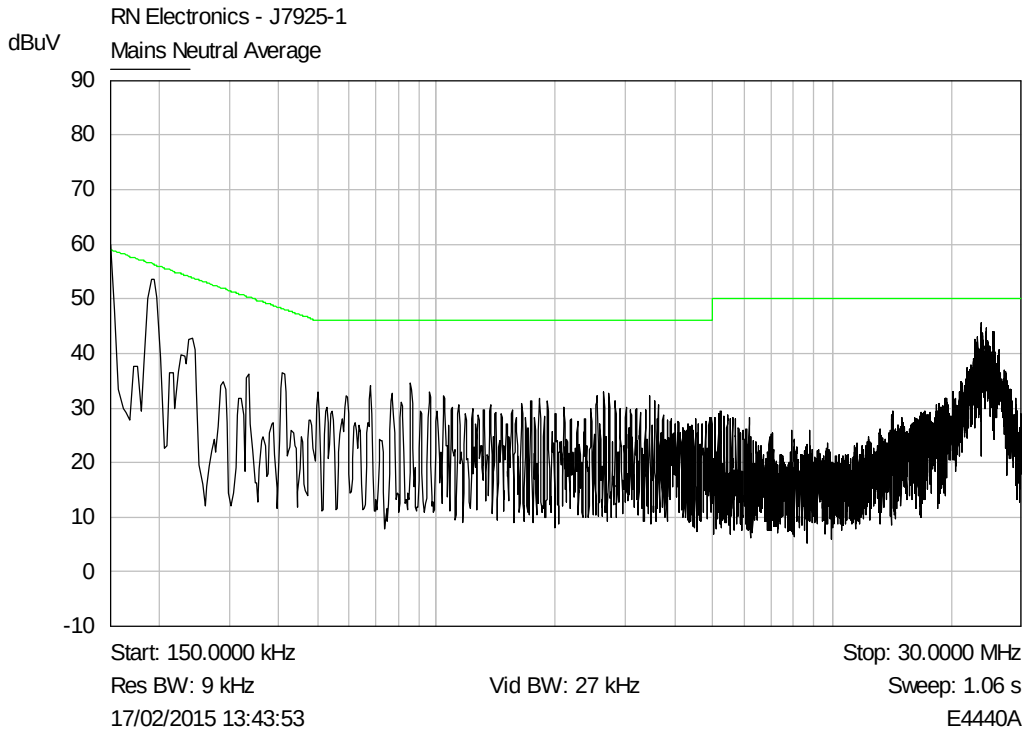
Table of signals measured.

Quasi-Peak and Average Live (Mains)

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP Lim (dB)	AV Amp (dBuV)	AV Lim (dB)
1	0.150	55.3	54.0	-12.0	50.6	-8.4
2	0.192	53.4	52.9	-11.0	50.3	-6.0
3	0.240	43.9	43.2	-18.9	40.8	-13.1
4	0.592	34.7	33.9	-22.1	32.7	-13.3
5	23.863	44.4	40.6	-19.4	31.2	-18.8
6	24.471	43.5	39.9	-20.1	29.3	-20.7
7	24.524	43.7	40.5	-19.5	30.7	-19.3
8	24.591	44.0	40.4	-19.6	31.0	-19.0
9	24.622	44.0	39.2	-20.8	28.4	-21.6
10	25.487	43.7	40.4	-19.6	29.4	-20.6



Plot of peak emissions 150kHz - 30MHz on the Mains neutral terminal against the quasi-peak limit line.



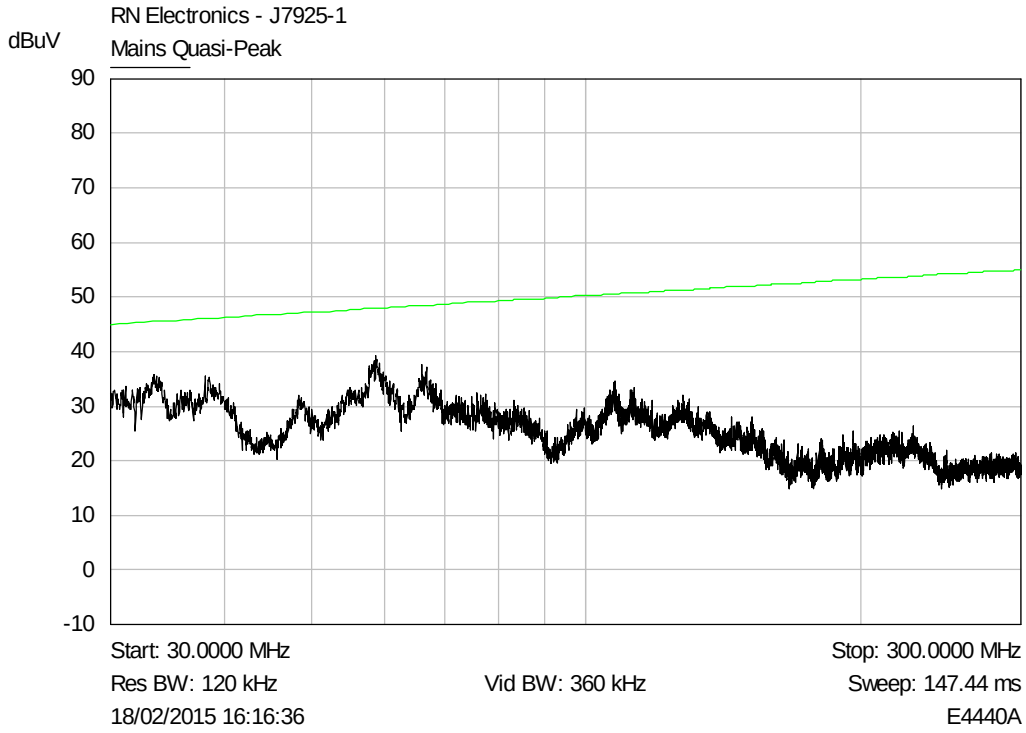
Plot of peak emissions 150kHz - 30MHz on the Mains neutral terminal against the average limit line.

Table of signals measured.

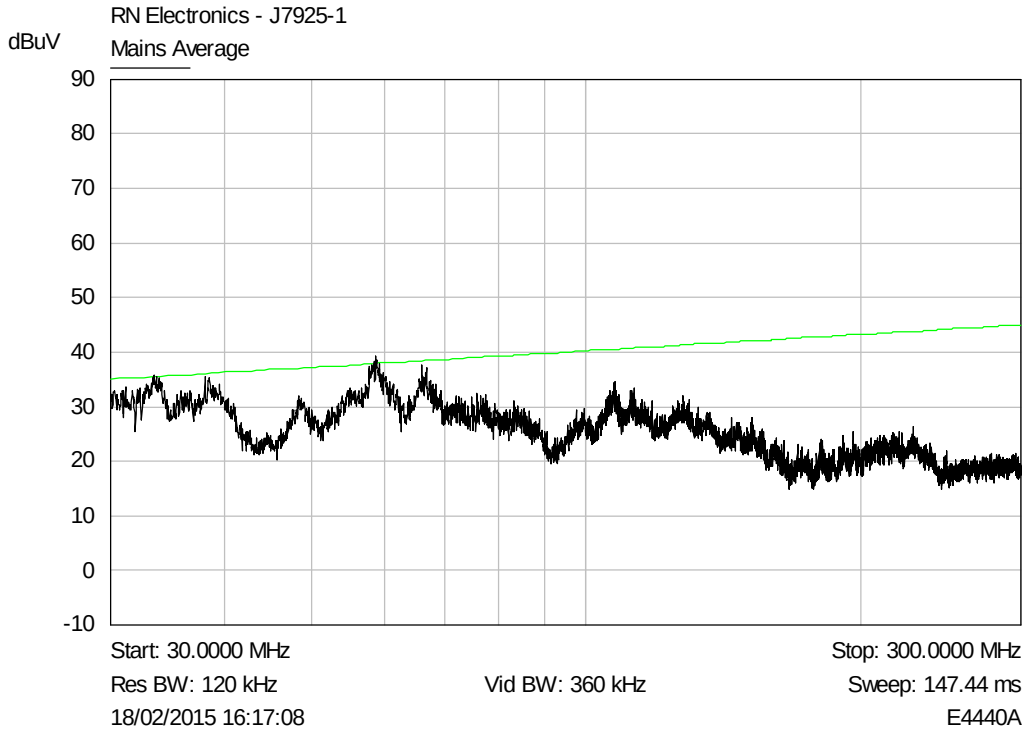
Quasi-Peak and Average Neutral (Mains)

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP Lim (dB)	AV Amp (dBuV)	AV Lim (dB)
1	0.150	55.7	54.5	-11.5	51.0	-8.0
2	0.192	53.9	53.3	-10.6	50.4	-5.9
3	0.240	44.3	43.5	-18.6	40.9	-13.0
4	0.410	36.8	36.2	-21.4	35.5	-12.6
5	23.862	44.3	41.5	-18.5	31.8	-18.2
6	23.941	43.7	40.4	-19.6	28.2	-21.8
7	24.519	43.8	38.8	-21.2	29.1	-20.9
8	24.571	44.9	39.7	-20.3	26.4	-23.6
9	25.491	42.2	39.3	-20.7	29.8	-20.2
10	25.650	40.6	37.6	-22.4	28.0	-22.0

7.2 Disturbance power



Plot of peak emissions 30MHz - 300MHz on the Mains port against the quasi-peak limit line.



Plot of peak emissions 30MHz - 300MHz on the Mains port against the average limit line.

Table of signals measured.

Quasi-Peak and Average (Mains)

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP Lim (dB)	AV Amp (dBuV)	AV Lim (dB)
1	33.489	37.2	32.7	-12.8	23.4	-12.1
2	37.276	31.3	26.1	-19.8	18.5	-17.4
3	48.424	27.9	23.4	-23.7	15.3	-21.8
4	58.359	38.7	33.2	-14.7	22.3	-15.6
5	66.583	36.7	32.2	-16.3	21.3	-17.2
6	107.307	34.5	28.8	-21.7	18.4	-22.1

8 Explanation of Table of Signals Measured

Measurements are made as required by the standard. These measurements are made and recorded using detectors, either peak, quasi peak or average dependant on the test. A table of results has been given following the relevant plots. This table looks similar to the one illustrated below dependant on the measurements required by the test: -

Signal No.	Freq (MHz)	Peak Amp (dBuV)	Pk – Lim 1 (dB)	QP Amp (dBuV)	QP - Lim1 (dB)	Av Amp (dBuV)	Av - Lim1 (dB)
1	12345	54.9	-10.5	48.0	-12.6	37.6	-14.4

Column One - Labelled Signal No. is an incremental number that the receiver has given to each signal that has been measured.

Column Two - Labelled Freq (MHz) is the approximate frequency of the signal received.

Column Three - Labelled Peak Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the peak detector.

Column Four - Labelled Pk - Lim1 (dB) is the difference in level from the peak signal given to the active limit line. If this column appears in the table the peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Five - Labelled QP Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the quasi-peak detector.

Column Six - Labelled QP - Lim1 (dB) is the difference in level from the quasi-peak signal given to the active limit line. If this column appears in the table the quasi-peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Seven - Labelled Av Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the average detector.

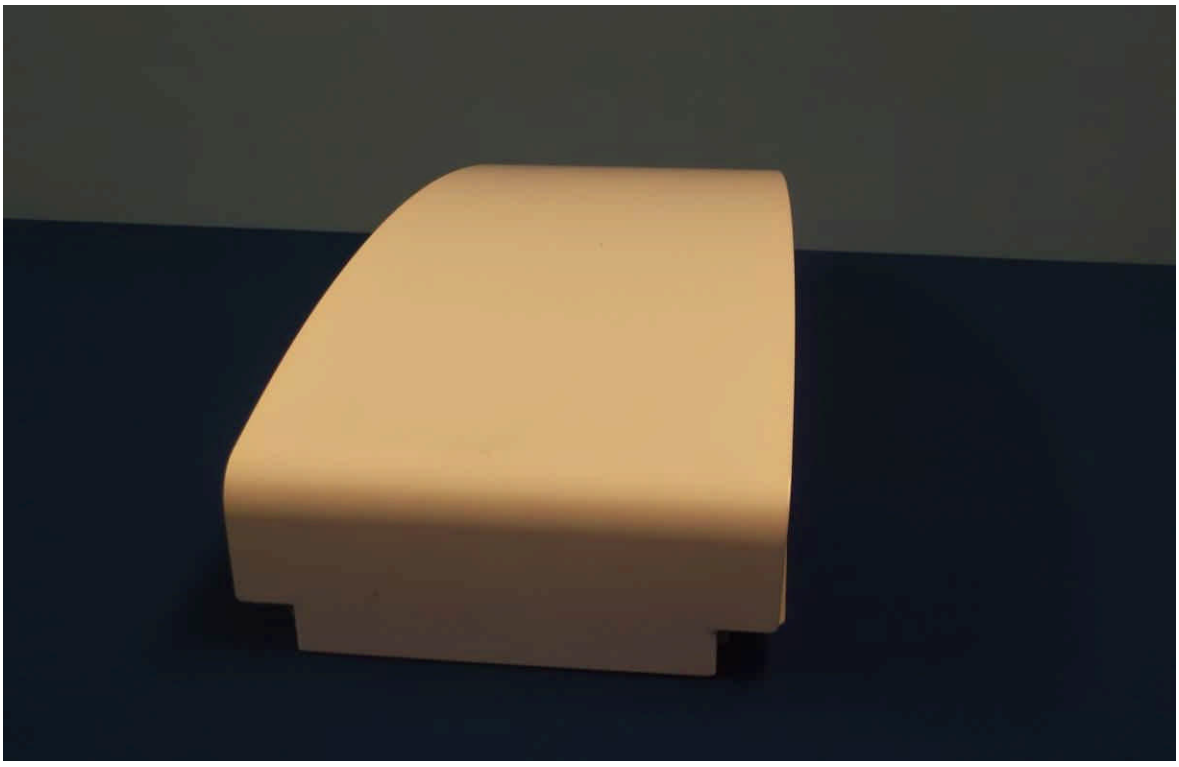
Column Eight - Labelled Av - Lim1 (dB) is the difference in level from the average signal given to the active limit line. If this column appears in the table the average detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Only signals highlighted in red are deemed to exceed the limit of the detector required.

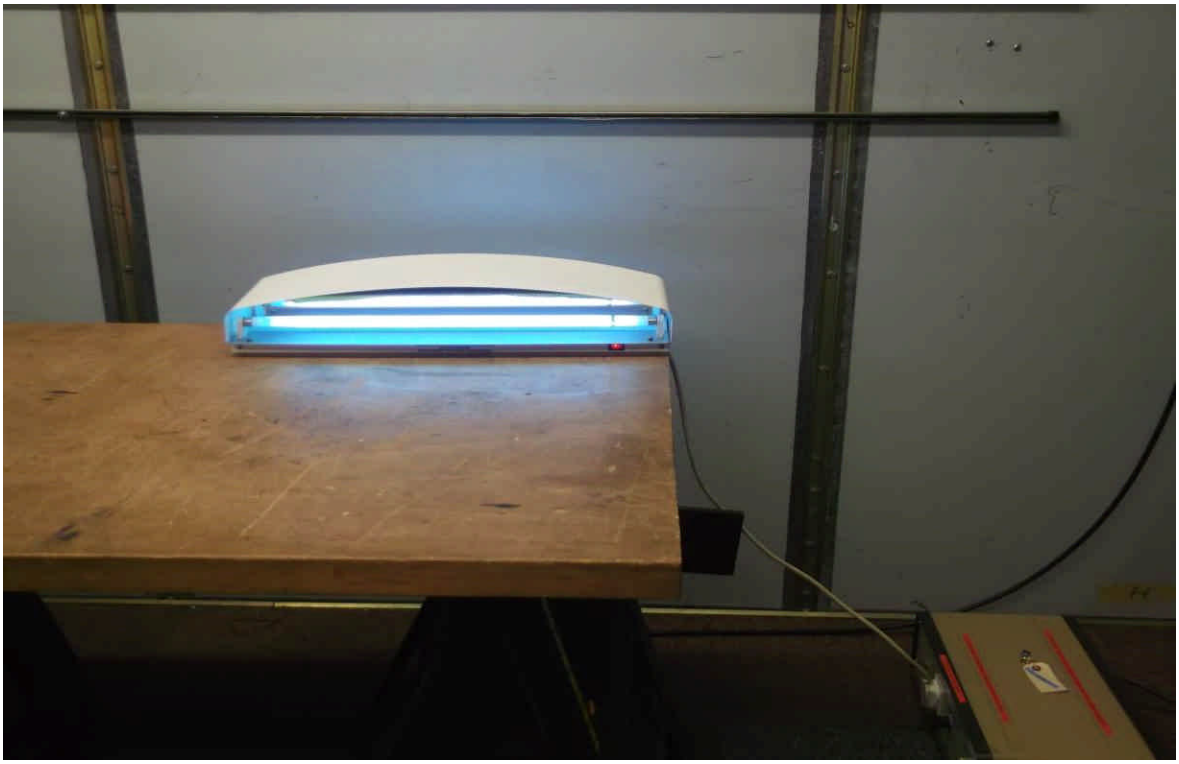
The radiated emission limits stated in the specification are for a measurement distance of 10m, but an allowance is made for testing at closer distances down to 3m by extrapolation of the limit at a rate of 20dB per decade (distance). E.g. limits at 3m distance are 10dB higher than those at 10m.

9 Photographs

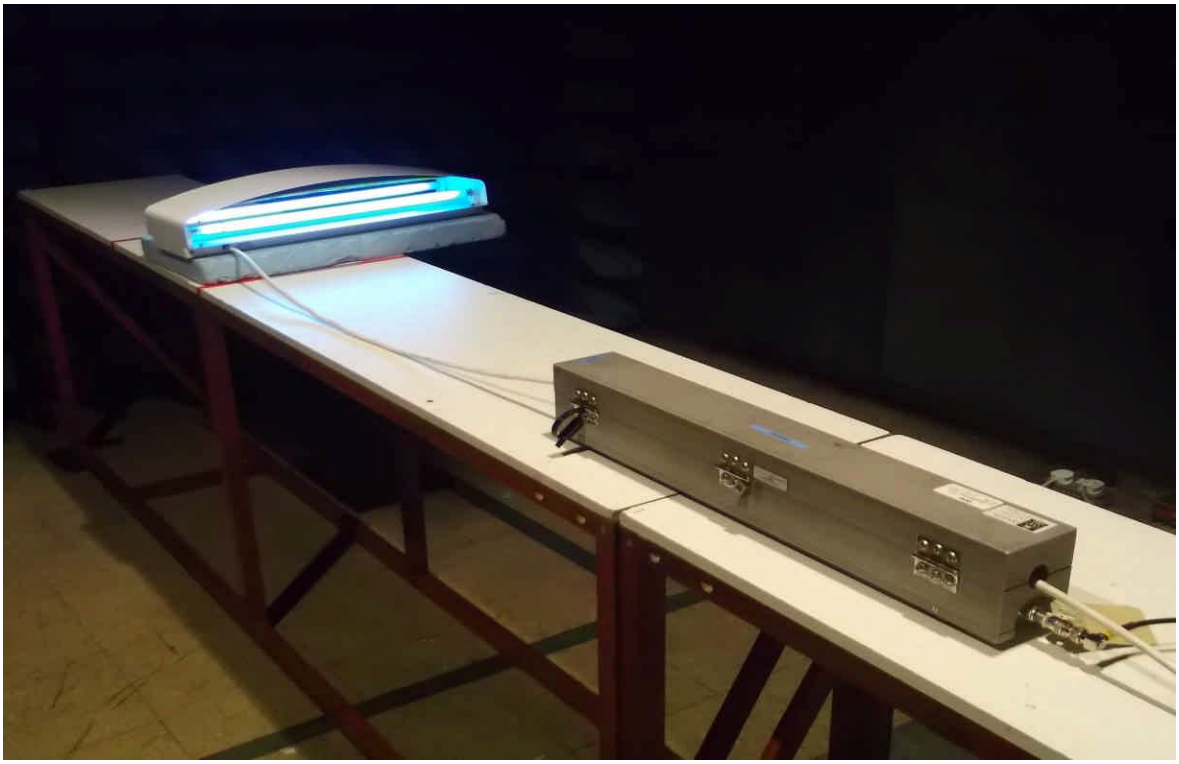
9.1 Identifying photograph of the EUT



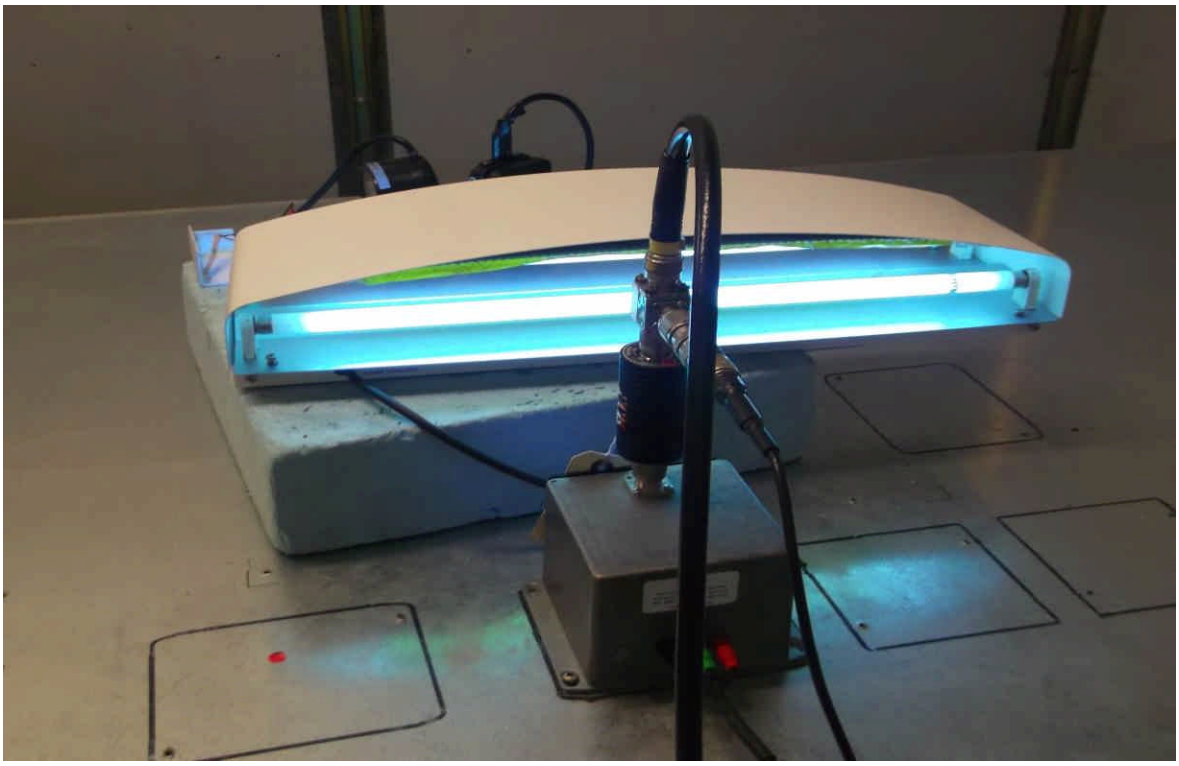
9.2 Mains terminal disturbance voltages

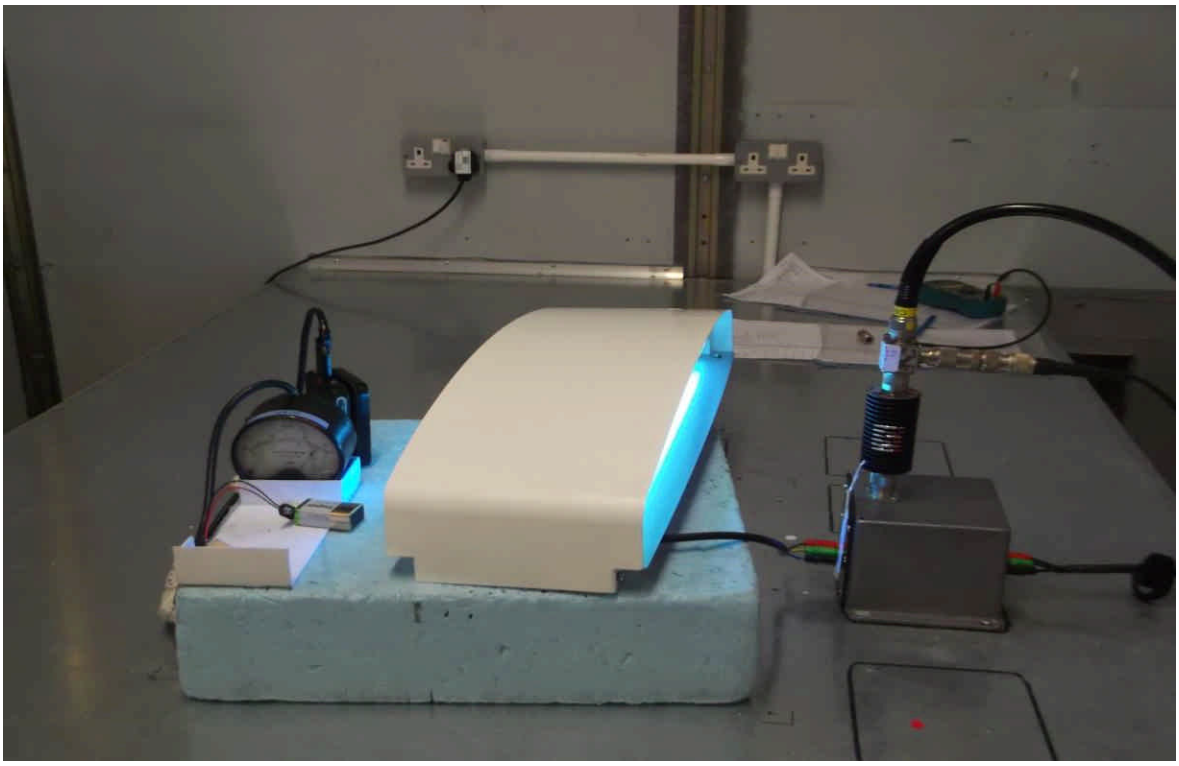


9.3 Disturbance power

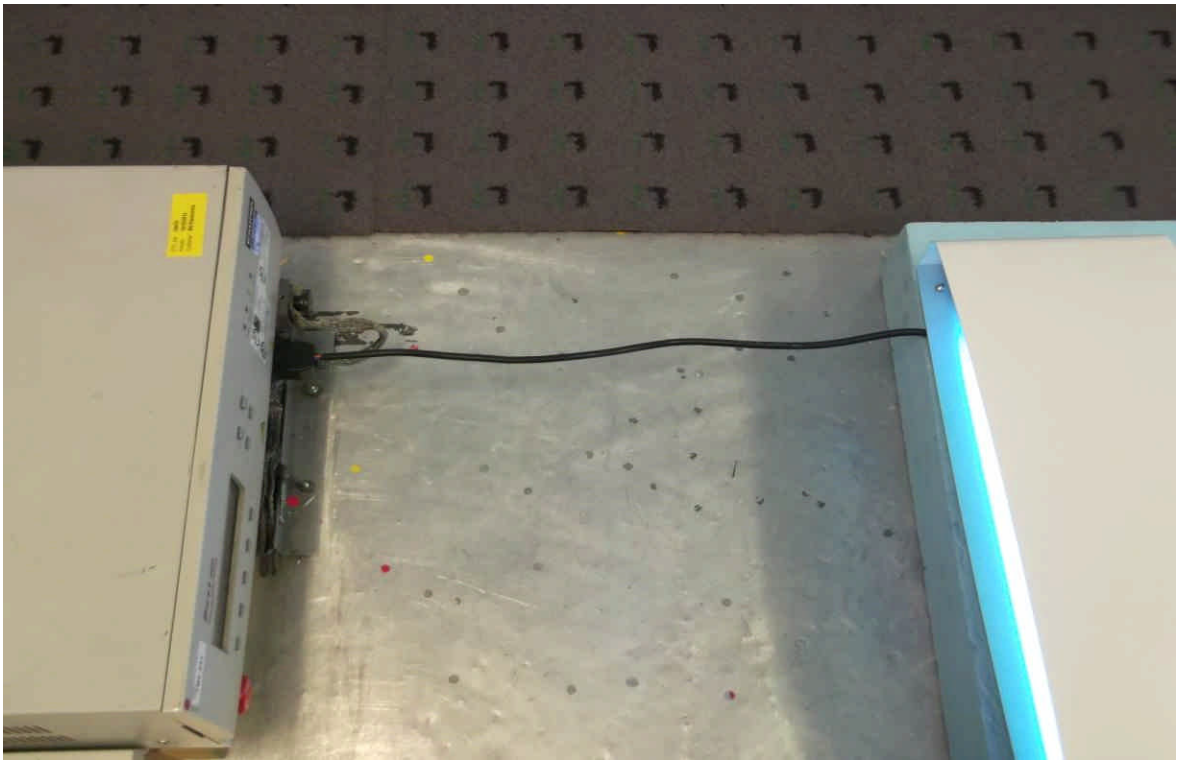


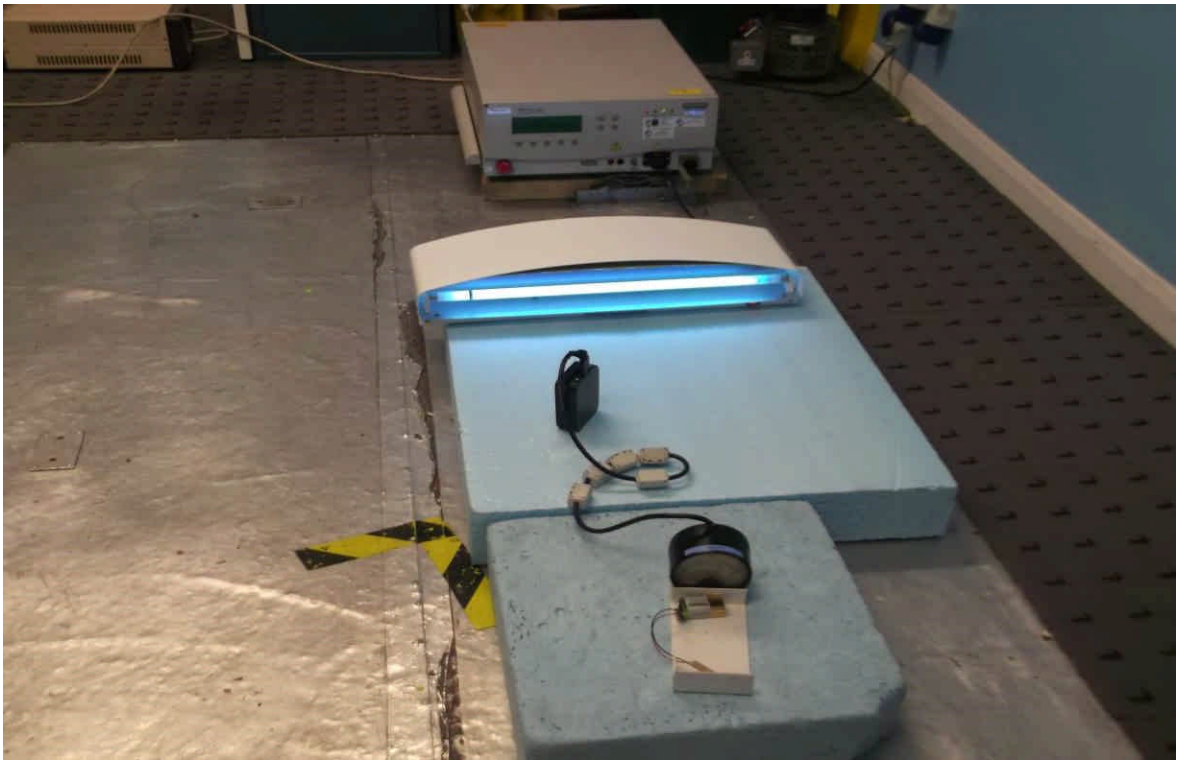
9.4 Injected currents, 0.15 MHz to 230 MHz



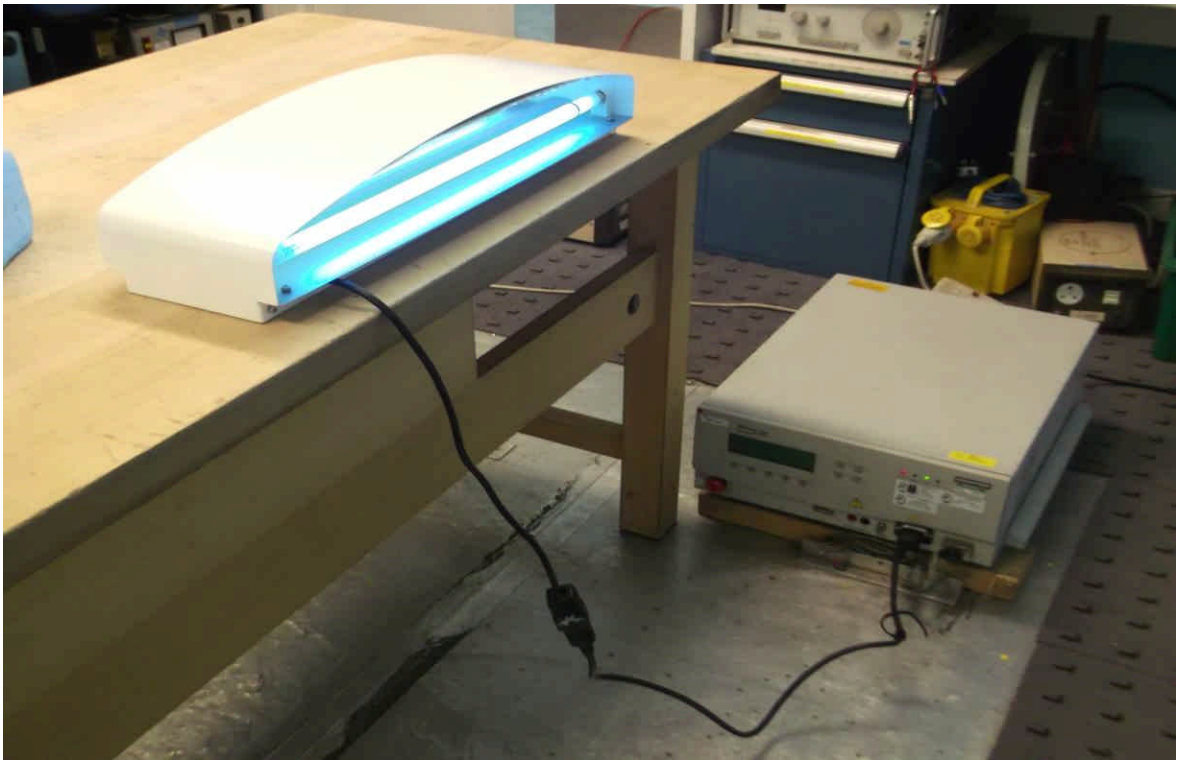


9.5 Fast Transients

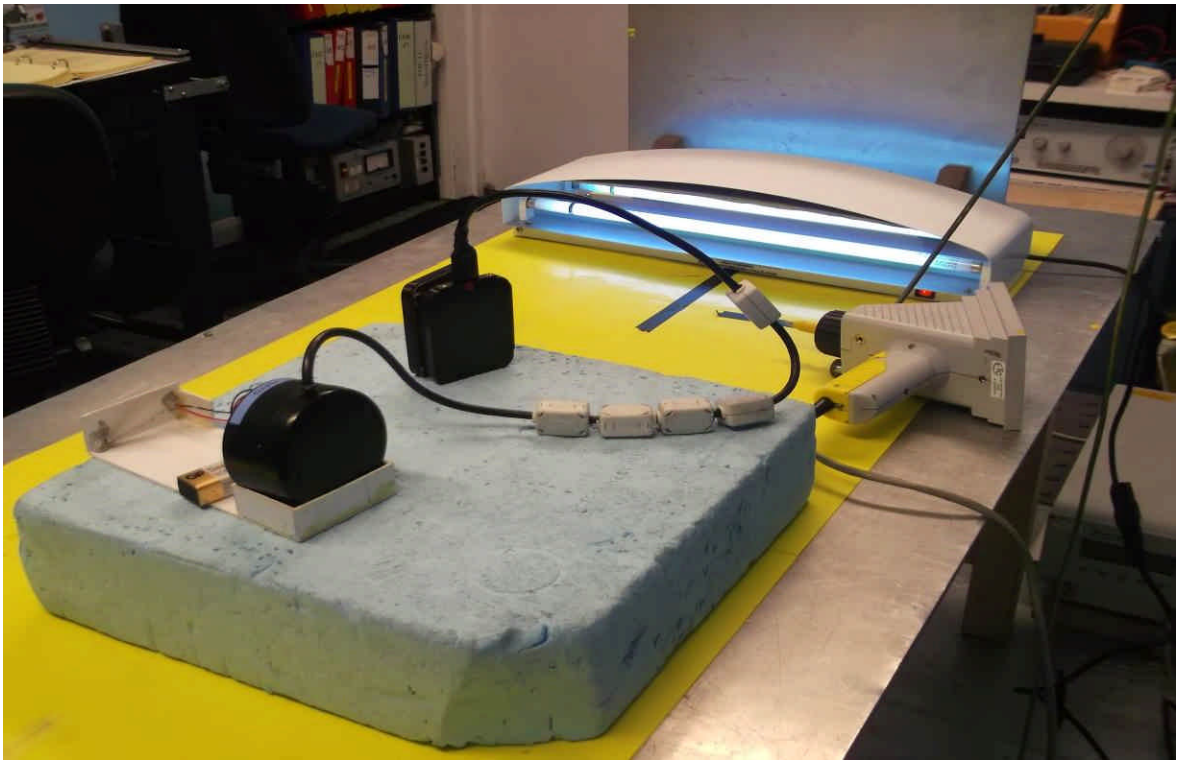


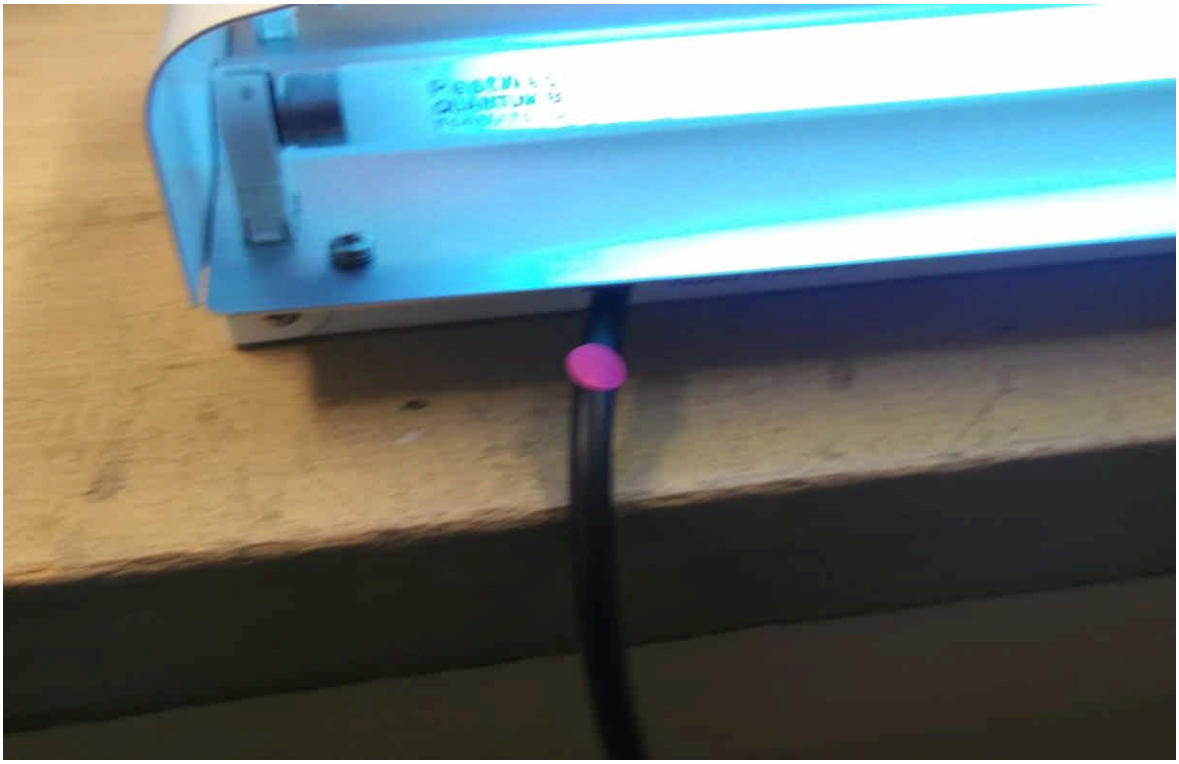


9.6 Surges

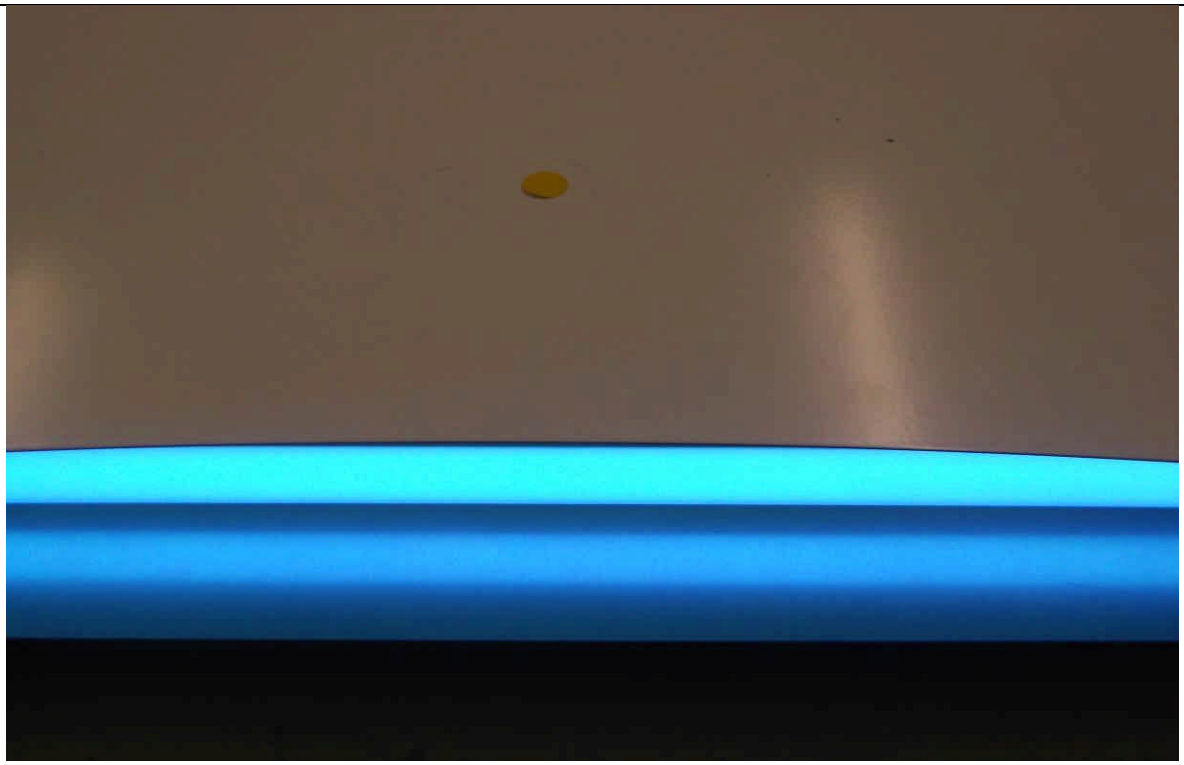


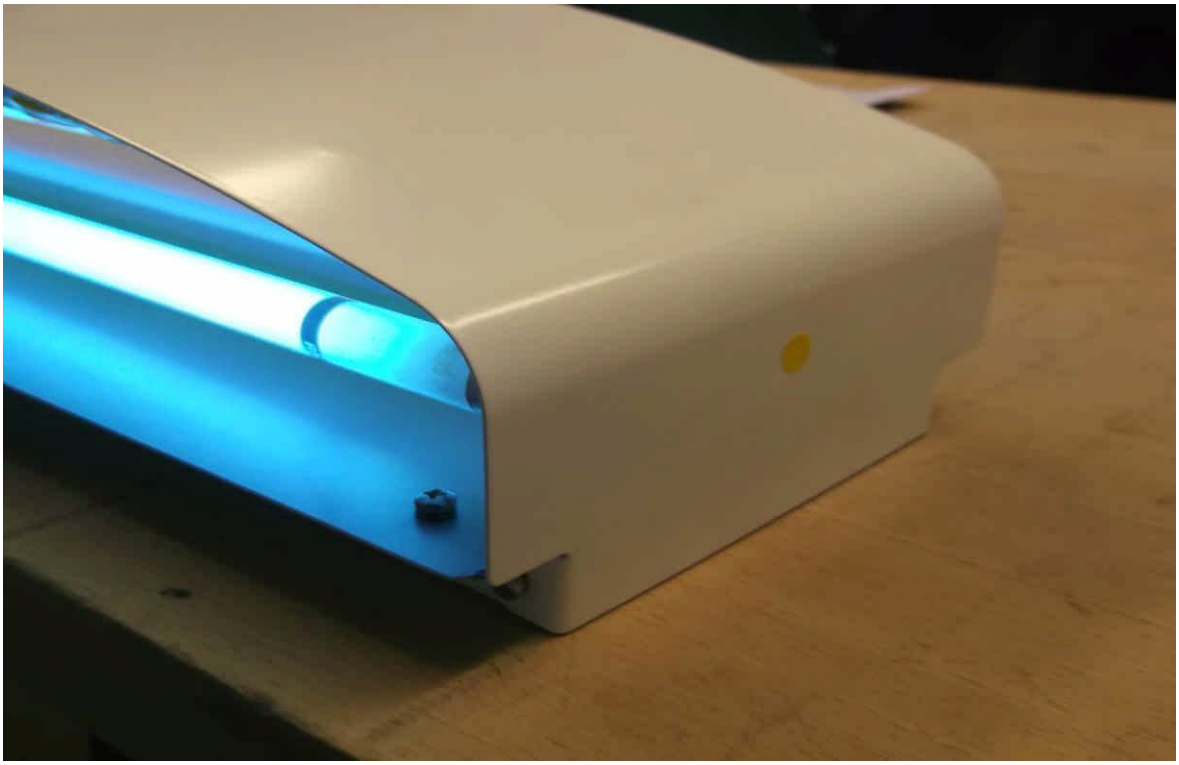
9.7 Electrostatic discharge



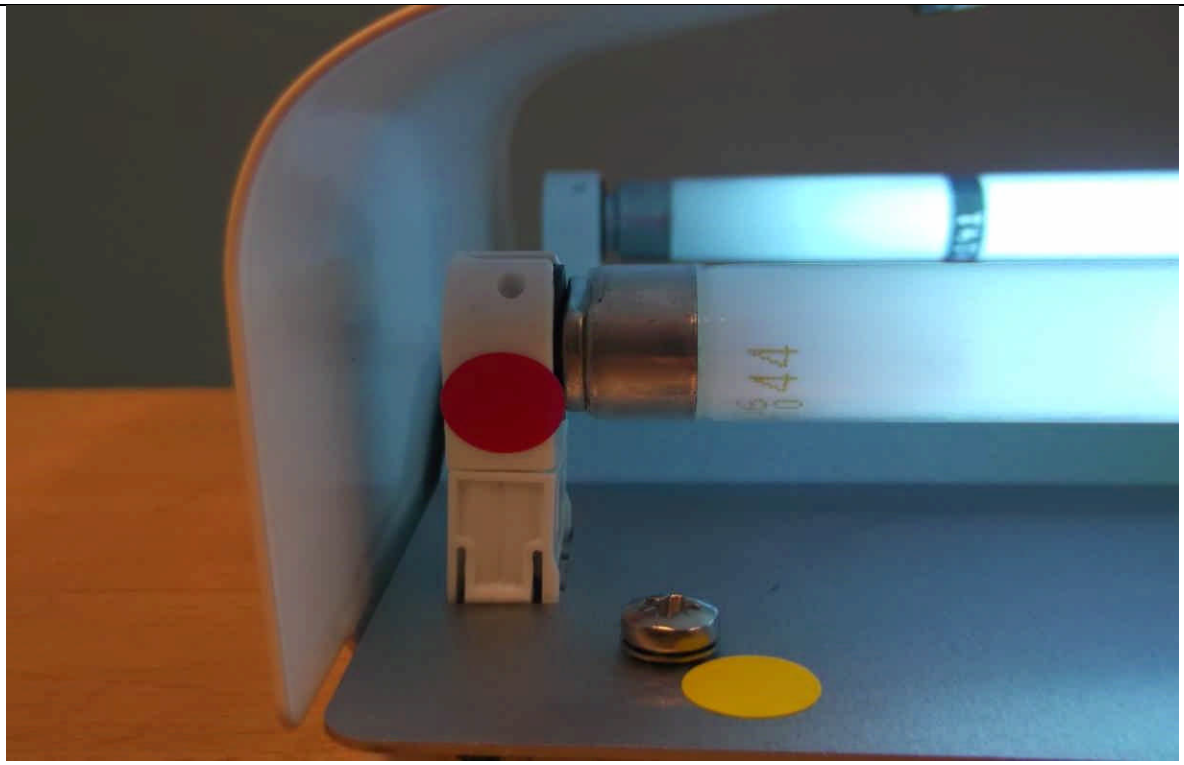


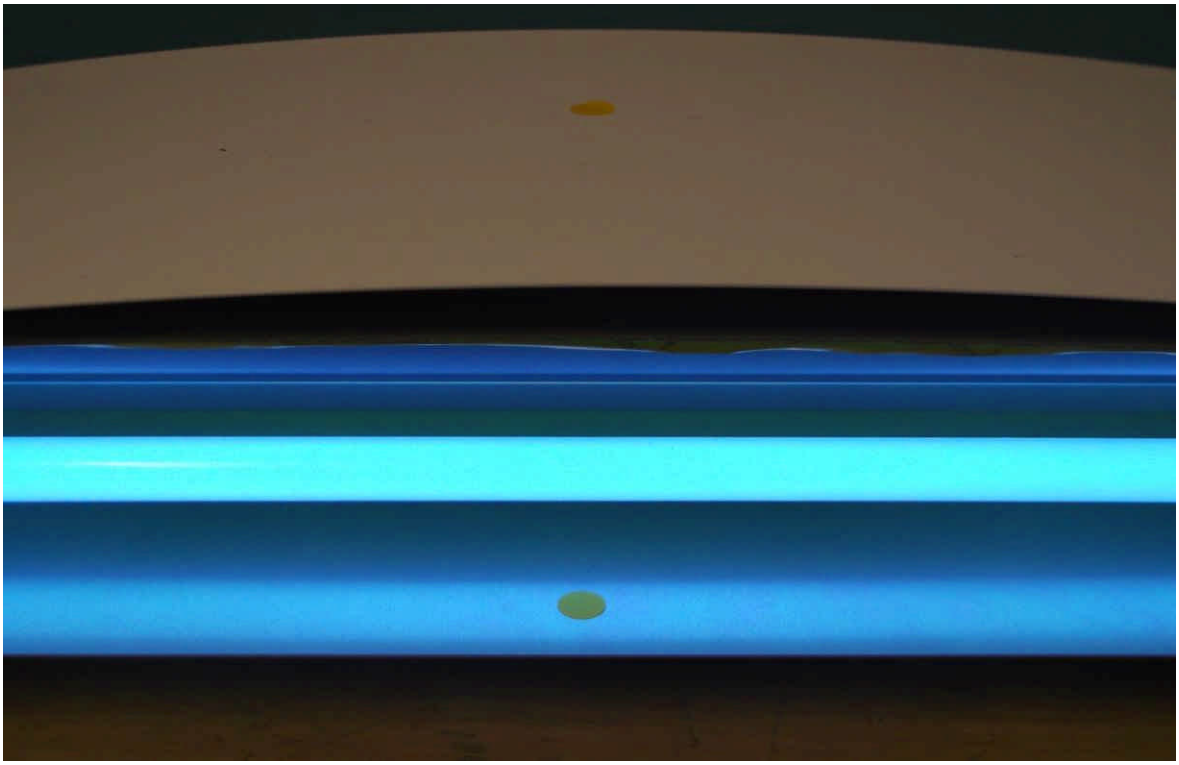
	Contact Discharge Points
	Air Discharge Points



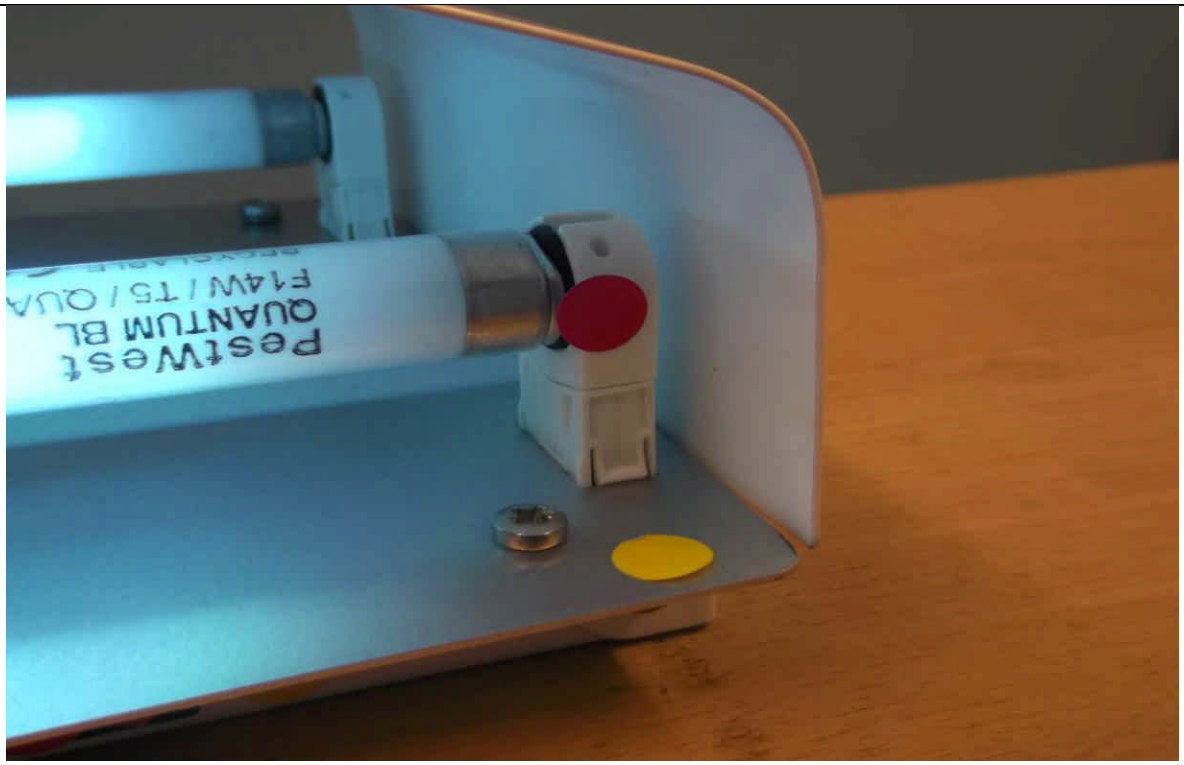


	Contact Discharge Points
	Air Discharge Points





	Contact Discharge Points
	Air Discharge Points



	Contact Discharge Points
	Air Discharge Points

10 Test equipment calibration list

The following is a list of the test equipment used by ***R.N. Electronics Ltd.*** to test the unit detailed within this report. In line with our procedures, the equipment was within calibration for the period during which testing was carried out.

RN No.	Model	Description	Manufacturer
E083	M305	Wideband Amplifier	RF Power Labs
E150	MN2050	LISN 13A	Chase
E198	HP11947A	Transient Limiter + 10dB Atten.	Hewlett Packard
E274	437B	Power Meter	Hewlett Packard
E368	Att06	6 dB BNC Attenuator	Greenpar
E391	8482A	Power Sensor	HP
E394	CPL40	40 dB Coupler	RNE
E395	8491B	6 dB Attenuator	HP
E476	801-M3	CDN	RN Electronics Ltd
E531	24-6-34	6dB Attenuator 50W	Weinschel Engineering
E533	N5182A	6 GHz MXG Signal Generator	Agilent Technologies
E534	E4440A	3 Hz - 26.5 GHz PSA	Agilent Technologies
E535	N9039A	9 kHz - 1 GHz RF Filter Section	Agilent Technologies
TMS33	SMH	Signal Generator 2GHz	Rohde & Schwarz
TMS942	BEST EMC	Burst Generator V2.3	Schaffner
TMS943	BEST EMC	ESD Simulator	Schaffner
TMS947	MDS21	Absorbing Clamp 30-1000MHz	Luthi

11 Auxiliary and peripheral equipment

11.1 Customer supplied equipment

No customer supplied equipment was used

11.2 RN Electronics supplied equipment

RN No.	Model No.	Description	Manufacturer	Serial No
N470	LUX	Auto-photometer	Everett-Edgcumbe	633482

12 Condition of the equipment tested.

12.1 Modifications before test

The White bar signifies the **original** location of the output cables from the ballast.

The picture shows the location of where the cables need to be to pass Conducted Emissions.

12.2 Modifications during test

There were no modifications made by R.N. Electronics Ltd during testing.

13 Description of Test Sites

Site A	Radio / Calibration Laboratory and anechoic chamber
Site B	Semi-anechoic chamber
Site B1	Control Room for Site B
Site C	Transient Laboratory
Site D	Screened Room (Conducted Immunity)
Site E	Screened Room (Control Room for Site D)
Site F	Screened Room (Conducted Emissions) VCCI Registration No. C-2823
Site K	Screened Room (Control Room for Site M)
Site M	3m Semi-anechoic chamber (indoor OATS) FCC Registration No. 293246
Site Q	Fully-anechoic chamber
Site OATS	3m and 10m Open Area Test Site FCC Registration No. 293246 IC Registration No. 5612A-1 VCCI Registration No. R-2580
Site R	Screened Room (Conducted Immunity)
Site S	Safety Laboratory
Site T	Transient Laboratory