



TEST REPORT

Reference No. : WTU20F08053685E
 Applicant : PhotonTek Horticultrual Lighting
 Address : Ewropa Business Centre, Level 3-701 Dun Karm Street, Birkirkara,
 BKR 9034, Malta
 Manufacturer : The same as above
 Address : The same as above
 Product Name : PhotonTek X465W Pro LED
 Model No. : X465W PRO
 Standards : ICES-005 Issue 4(Dec.,2015)
 Date of Receipt sample : 2020-07-09
 Date of Test : 2020-07-13 to 2020-07-21
 Date of Issue : 2020-08-12
 Test Report Form No..... : WEO-ICES005A-02A
 Test Result : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Foshan) Co., Ltd.

Address: No.13-19, 2/F., 2nd Building, Sunlink International Machinery City,
Chencun, Shunde District, Foshan, Guangdong, China

Tel:+86-757-23811398

Fax:+86-757-23811381

E-mail:info@waltek.com.cn

Compiled by:

Jace Zhi

Jace Zhi / Project Engineer

Approved by:



Danny Zhou

Danny Zhou / Manager



1 Test Summary

EMISSION				
Test Item	Test Standard	Class	Test Method	Test Result
Conducted Emission	ICES-005 Issue 4(Dec.,2015)	Class B	Section 4	Pass
Radiated Emission	ICES-005 Issue 4(Dec.,2015)	Class B	Section 4	Pass

Remark:

Pass

Test item meets the requirement

Fail

Test item does not meet the requirement

N/A

Test case does not apply to the test object



WALTEK



2 Contents

	Page
COVER PAGE	1
1 TEST SUMMARY	2
2 CONTENTS	3
3 GENERAL INFORMATION	4
3.1 GENERAL DESCRIPTION OF E.U.T.....	4
3.2 DETAILS OF E.U.T.....	4
3.3 DESCRIPTION OF SUPPORT UNITS.....	4
3.4 STANDARDS APPLICABLE FOR TESTING.....	4
3.5 TEST FACILITY.....	5
3.6 SUBCONTRACTED.....	5
3.7 ABNORMALITIES FROM STANDARD CONDITIONS.....	5
3.8 ABNORMALITIES FROM STANDARD CONDITIONS.....	5
4 EQUIPMENT USED DURING TEST	6
4.1 SOFTWARE LIST.....	6
4.2 MEASUREMENT UNCERTAINTY.....	7
4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT.....	7
4.4 DECISION RULE.....	7
5 EMISSION TEST RESULTS	8
5.1 CONDUCTED EMISSION.....	8
5.1.1 <i>E.U.T. Operation</i>	8
5.1.2 <i>Block Diagram of Test Setup</i>	8
5.1.3 <i>Measurement Data</i>	8
5.1.4 <i>Corrected Amplitude & Margin Calculation</i>	9
5.1.5 <i>Conducted Emission Test Data</i>	9
5.2 RADIATION EMISSION.....	13
5.2.1 <i>E.U.T. Operation</i>	13
5.2.2 <i>Block Diagram of Test Setup</i>	13
5.2.3 <i>Measurement Data</i>	13
5.2.4 <i>Corrected Amplitude & Margin Calculation</i>	14
5.2.5 <i>Radiated Emission Test Data</i>	14
6 PHOTOGRAPHS – TEST SETUP	18
6.1 PHOTOGRAPH – CONDUCTED EMISSION TEST SETUP.....	18
6.2 PHOTOGRAPH – RADIATED EMISSION TEST SETUP.....	18
7 PHOTOGRAPHS – CONSTRUCTIONAL DETAILS	19
7.1 EUT – EXTERNAL VIEW.....	19



3 General Information

3.1 General Description of E.U.T.

Product Name : PhotonTek X465W Pro LED

Model No. : X465W PRO

Remark..... : ---

3.2 Details of E.U.T.

Technical Data : AC 120-277V, 50/60Hz, 465W

3.3 Description of Support Units

The EUT has been tested as an independent unit. X465W PRO is the tested sample and both tests were performed in the condition of AC 120V/60Hz and AC 277V/50Hz input.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

ICES-005 Issue 4(Dec.,2015) Spectrum Management and Telecommunications Interference
Interference-Causing Equipment Standard
-Lighting Equipment

WALTEK



3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Services (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science and Economic Development Canada (ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number: 21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Services (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Services (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

3.6 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes No

If Yes, list the related test items and lab information:

Test items: DV

Lab information: WALTEK SERVICES(SuZhou)CO., LTD

3.7 Abnormalities from Standard Conditions

None.

3.8 Abnormalities from Standard Conditions

This report is based on report No. WTU20F07043114E for adding new applicant, manufacturer and a new customer model X465W PRO. The changes do not affect the EMC test items. Therefore the EUT is deemed to fulfill all the requirements and no further test has been performed.



4 Equipment Used during Test

Mains Terminal Disturbance Voltage 1#(Conducted Emission)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR3	102423	Valid
2.	LISN	R&S	ENV216	101343	Valid
3.	Cable	HUBER+SUHNER	CBL2-NN-6M	223NN624	Valid
4.	Switch	CD	RSU-A4 18G	RSUA4008	Valid
Mains Terminal Disturbance Voltage 2#(Conducted Emission)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2.	LISN	R&S	ENV216	101215	Valid
3.	Cable	HUBER+SUHNER	CBL2-NN-6M	6102701	Valid
4.	Switch	ESE	RSU/M2	---	Valid
Radiated Emission					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR7	101566	Valid
2.	Active Loop Antenna	SCHWARZBECK	FMZB1519B	00004	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9162	9162-117	Valid
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	01561	Valid
5.	Preamplifier	Lunar E M	LNA1G18-40	20160501002	Valid

4.1 Software List

Description	Manufacturer	Model	Version
EMI Test Software (Conducted Emission1#)	FARATRONIC	EZ-EMC	EMEC-3A1
EMI Test Software (Conducted Emission2#)	FARATRONIC	EZ-EMC	CON-03A1
EMI Test Software (Radiated Emission)	FARATRONIC	EZ-EMC	RA-03A1-1



4.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.7dB	(1)
Radiated Emission	30MHz~1GHz	±4.1dB	(1)
Radiated Emission	1GHz~6GHz	±5.0dB	(1)
Radiated Emission	6GHz~18GHz	±5.0dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

4.3 Special Accessories and Auxiliary Equipment

Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	/	/	/	/	/

4.4 Decision Rule

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If U_{LAB} is less than or equal to U_{CISPR} , then

-Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

-Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{LAB} is greater than U_{CISPR} , then

-Compliance is deemed to occur if no measured disturbance level, increased by $(U_{LAB} - U_{CISPR})$, exceeds the disturbance limit;

-Non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{LAB} - U_{CISPR})$, exceeds the disturbance limit.

WALTEK



5 Emission Test Results

5.1 Conducted Emission

Test Requirement : ICES-005
Test Method : ICES-005, Section 5
Test Result : Pass
Test Limit..... : ICES-005, Section 4.5.1 Class B
Frequency Range : 0.15MHz to 30MHz
Class..... : Class B

5.1.1 E.U.T. Operation

Operating Environment:

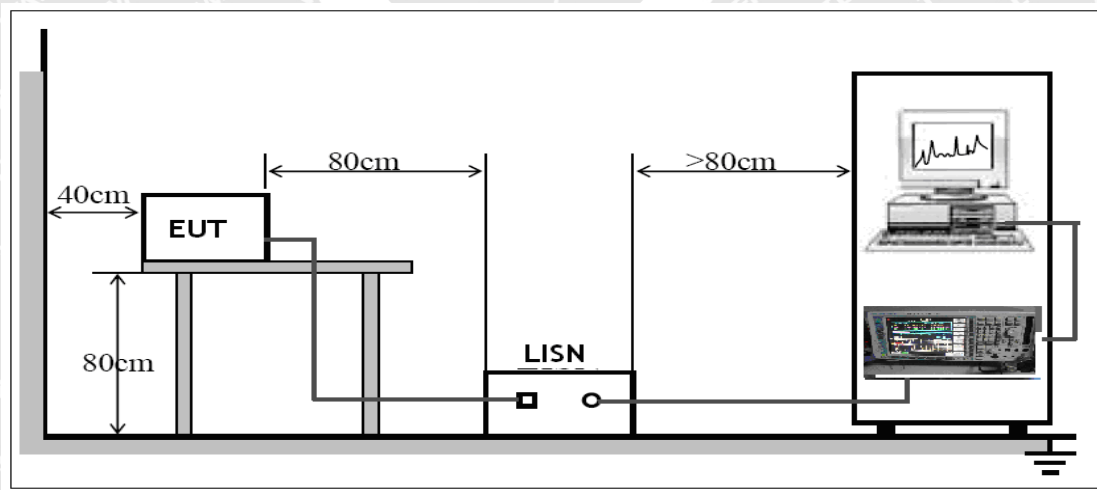
Temperature..... : 23°C
Humidity : 60%RH
Atmospheric Pressure : 101.2kPa

EUT Operation:

Input Voltage..... : AC 120V/60Hz; AC 277V/50Hz
Operating Mode : Lighting mode

5.1.2 Block Diagram of Test Setup

The Conducted Emission tests were performed in accordance with the ICES-005:2015.



5.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.



5.1.4 Corrected Amplitude & Margin Calculation

The Corrected factor is calculated by adding LISN VDF(Voltage Division Facotr), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Measurement} = \text{Reading Level} + \text{Correct Factor}$$

$$\text{Correct Facotor} = \text{LISN VDF} + \text{Cable Loss}$$

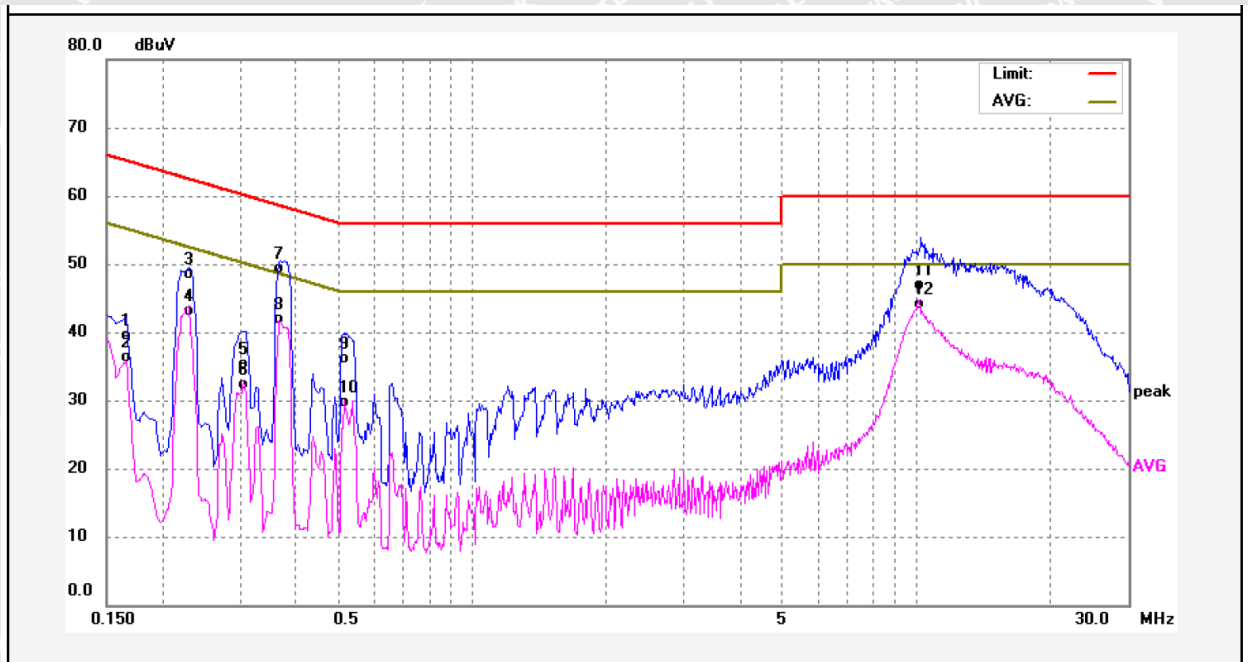
The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Measurement}$$

5.1.5 Conducted Emission Test Data

AC 120V/60Hz input

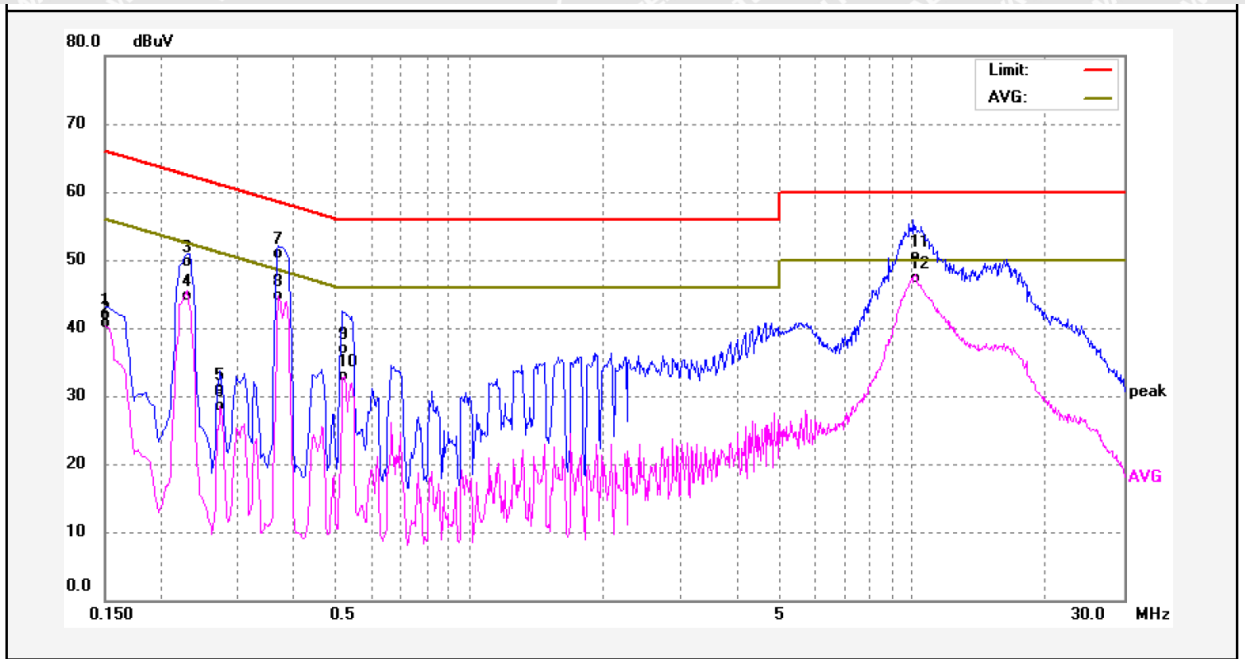
Live Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1660	29.87	9.64	39.51	65.15	-25.64	QP	
2	0.1660	26.65	9.64	36.29	55.15	-18.86	AVG	
3	0.2300	38.92	9.66	48.58	62.45	-13.87	QP	
4	0.2300	33.45	9.66	43.11	52.45	-9.34	AVG	
5	0.3059	25.63	9.65	35.28	60.08	-24.80	QP	
6	0.3059	22.70	9.65	32.35	50.08	-17.73	AVG	
7	0.3700	39.57	9.64	49.21	58.50	-9.29	QP	
8	0.3700	32.21	9.64	41.85	48.50	-6.65	AVG	
9	0.5180	26.55	9.61	36.16	56.00	-19.84	QP	
10	0.5180	20.03	9.61	29.64	46.00	-16.36	AVG	
11	10.2860	37.10	9.87	46.97	60.00	-13.03	QP	
12	10.2860	34.20	9.87	44.07	50.00	-5.93	AVG	



Neutral Line

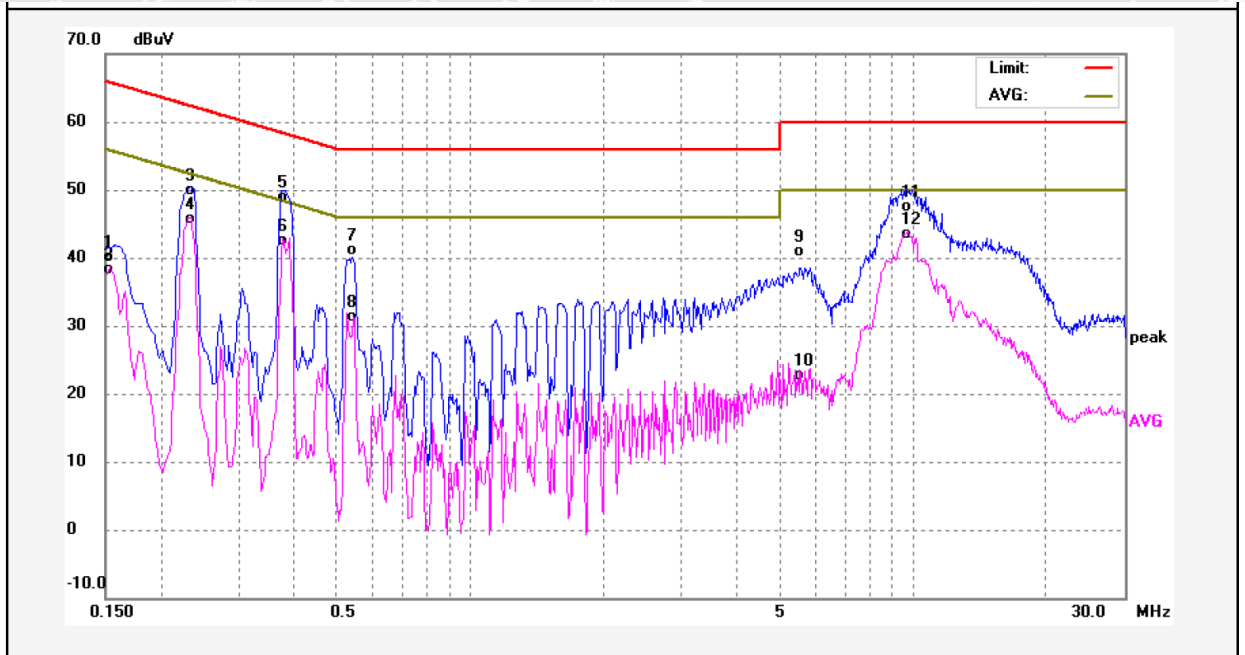


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1499	32.27	9.63	41.90	66.00	-24.10	QP	
2	0.1499	31.06	9.63	40.69	56.00	-15.31	AVG	
3	0.2300	40.14	9.66	49.80	62.45	-12.65	QP	
4	0.2300	35.14	9.66	44.80	52.45	-7.65	AVG	
5	0.2740	21.29	9.65	30.94	60.99	-30.05	QP	
6	0.2740	18.90	9.65	28.55	50.99	-22.44	AVG	
7	0.3700	41.23	9.64	50.87	58.50	-7.63	QP	
8	0.3700	35.11	9.64	44.75	48.50	-3.75	AVG	
9	0.5181	27.34	9.61	36.95	56.00	-19.05	QP	
10	0.5181	23.30	9.61	32.91	46.00	-13.09	AVG	
11	10.0340	40.74	9.86	50.60	60.00	-9.40	QP	
12	10.0340	37.43	9.86	47.29	50.00	-2.71	AVG	



AC 277V/50Hz input

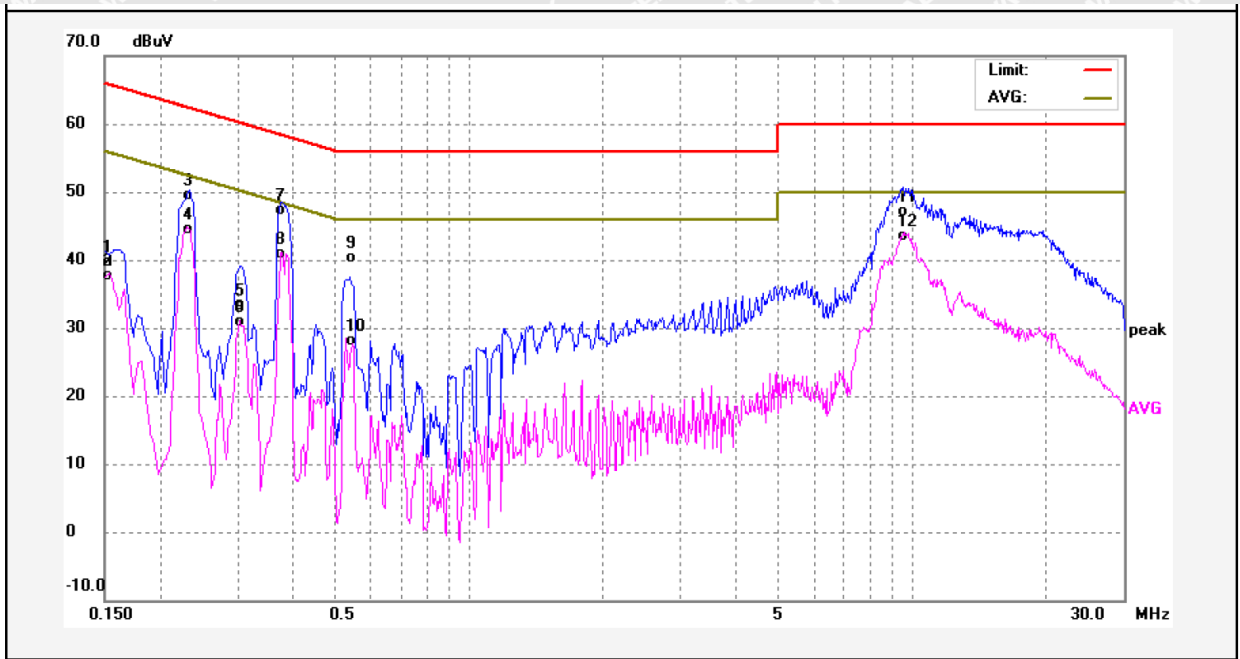
Live Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	40.16	-0.02	40.14	65.78	-25.64	QP	
2	0.1539	38.38	-0.02	38.36	55.78	-17.42	AVG	
3	0.2340	49.83	-0.01	49.82	62.30	-12.48	QP	
4	0.2340	45.70	-0.01	45.69	52.30	-6.61	AVG	
5	0.3780	49.01	-0.02	48.99	58.32	-9.33	QP	
6	0.3780	42.60	-0.02	42.58	48.32	-5.74	AVG	
7	0.5420	41.13	-0.03	41.10	56.00	-14.90	QP	
8	0.5420	31.34	-0.03	31.31	46.00	-14.69	AVG	
9	5.5698	40.92	-0.05	40.87	60.00	-19.13	QP	
10	5.5698	22.79	-0.05	22.74	50.00	-27.26	AVG	
11	9.6859	47.51	-0.07	47.44	60.00	-12.56	QP	
12	9.6859	43.53	-0.07	43.46	50.00	-6.54	AVG	



Neutral Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	30.13	9.63	39.76	65.78	-26.02	QP	
2	0.1539	28.03	9.63	37.66	55.78	-18.12	AVG	
3	0.2340	39.94	9.66	49.60	62.30	-12.70	QP	
4	0.2340	34.77	9.66	44.43	52.30	-7.87	AVG	
5	0.3059	23.61	9.65	33.26	60.08	-26.82	QP	
6	0.3059	21.22	9.65	30.87	50.08	-19.21	AVG	
7	0.3780	37.69	9.63	47.32	58.32	-11.00	QP	
8	0.3780	31.22	9.63	40.85	48.32	-7.47	AVG	
9	0.5380	30.72	9.62	40.34	56.00	-15.66	QP	
10	0.5380	18.55	9.62	28.17	46.00	-17.83	AVG	
11	9.5340	37.30	9.84	47.14	60.00	-12.86	QP	
12	9.5340	33.76	9.84	43.60	50.00	-6.40	AVG	



5.2 Radiation Emission

Test Requirement	: ICES-005
Test Method	: ICES-005, Section 5
Test Limit.....	: ICES-005, Section 4.5.2 Class B
Test Result	: Pass
Frequency Range	: 30MHz to 1000MHz
Class	: Class B

5.2.1 E.U.T. Operation

Operating Environment:

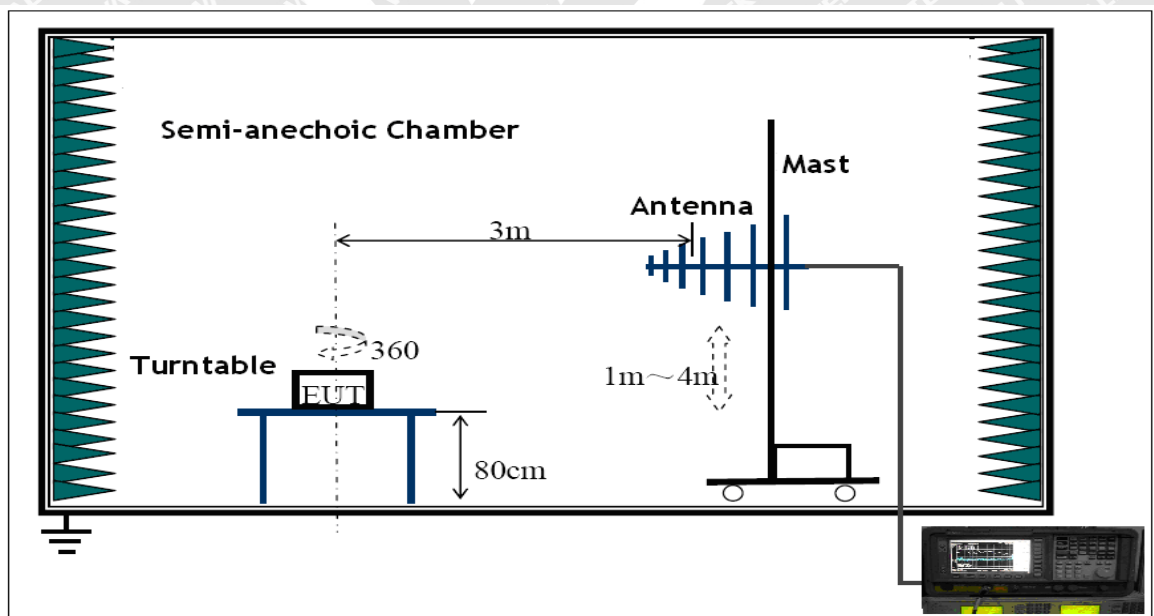
Temperature.....	: 25.5°C
Humidity	: 48.5%RH
Atmospheric Pressure	: 101.2kPa

EUT Operation:

Input Voltage.....	: AC 120V/60Hz; AC 277V/50Hz
Operating Mode	: Lighting mode

5.2.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ICES-005:2015



5.2.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for EUT 0°-360°. Quasi-peak measurements were performed if peak emissions were within 6dB of the limit line.



5.2.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Corr. Factor}$$

$$\text{Corr. Factor} = \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit.

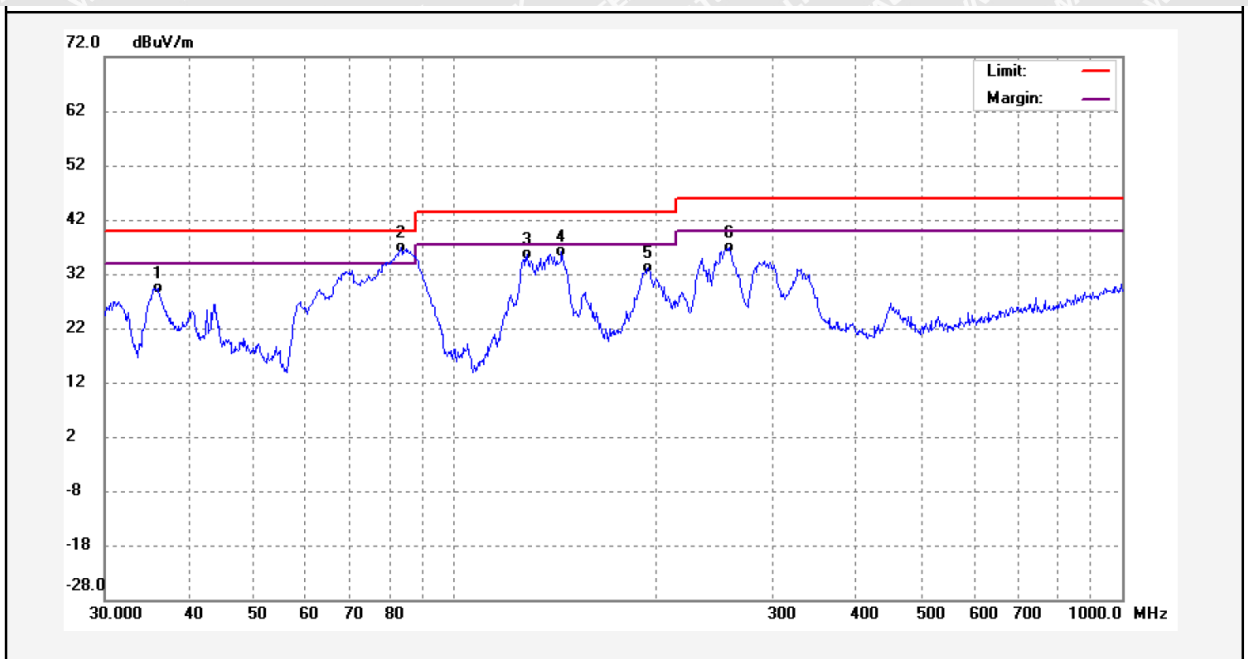
The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

5.2.5 Radiated Emission Test Data

AC 120V/60Hz input

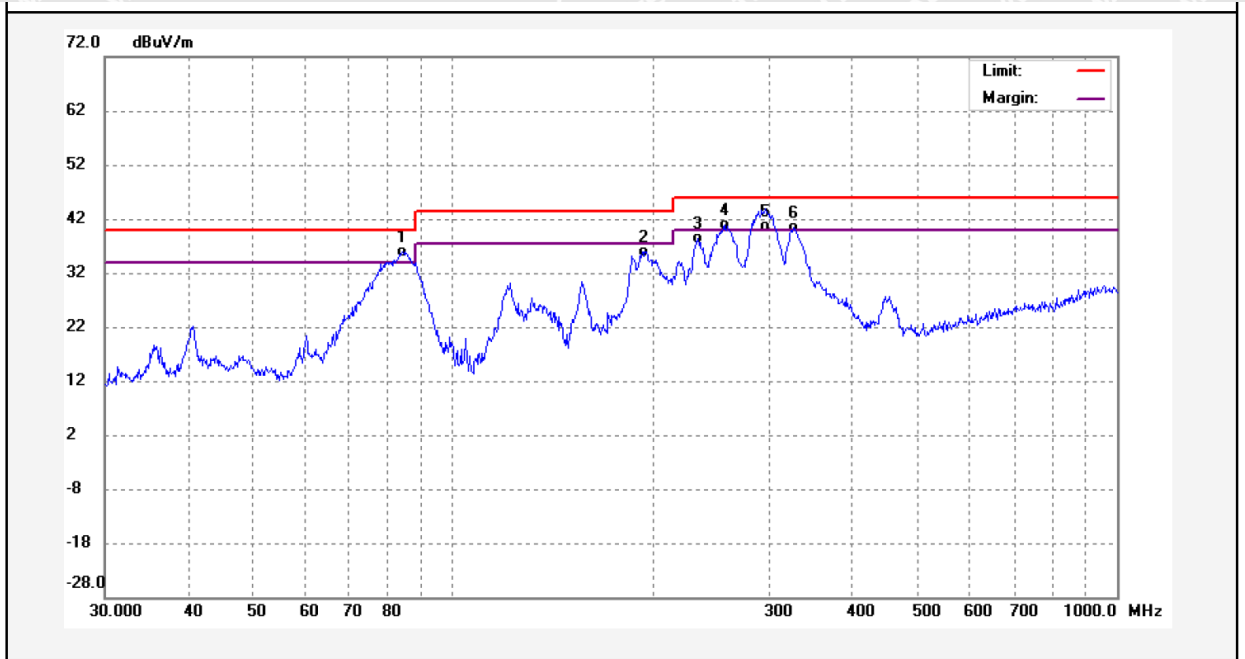
Vertical Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	36.0133	16.22	13.25	29.47	40.00	-10.53	QP	
2	83.3759	26.37	10.44	36.81	40.00	-3.19	QP	
3	128.7434	25.15	10.41	35.56	43.50	-7.94	QP	
4	145.0451	26.31	9.90	36.21	43.50	-7.29	QP	
5	195.1365	20.35	12.88	33.23	43.50	-10.27	QP	
6	259.1429	21.14	15.67	36.81	46.00	-9.19	QP	



Horizontal Polarization



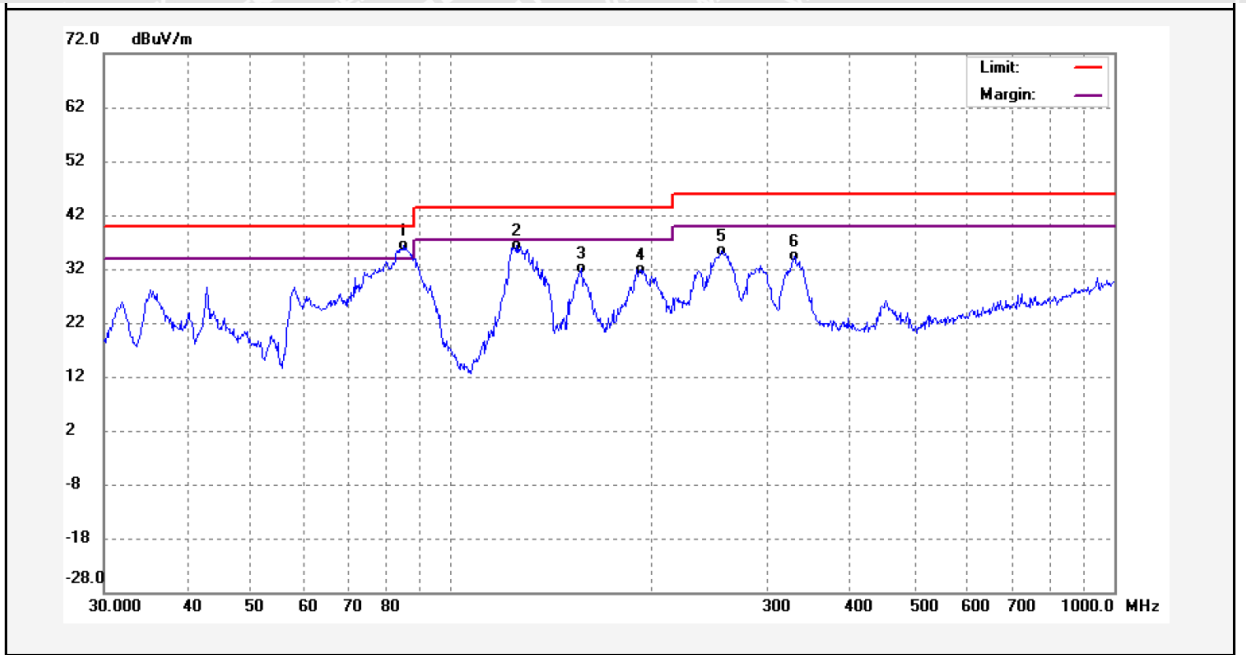
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	84.1395	25.30	10.55	35.85	40.00	-4.15	QP	
2	194.9997	23.12	12.87	35.99	43.50	-7.51	QP	
3	234.7438	23.93	14.44	38.37	46.00	-7.63	QP	
4	256.8811	25.15	15.70	40.85	46.00	-5.15	QP	
5	296.9115	24.33	16.35	40.68	46.00	-5.32	QP	
6	326.7395	23.91	16.49	40.40	46.00	-5.60	QP	





AC 277V/50Hz input

Vertical Polarization

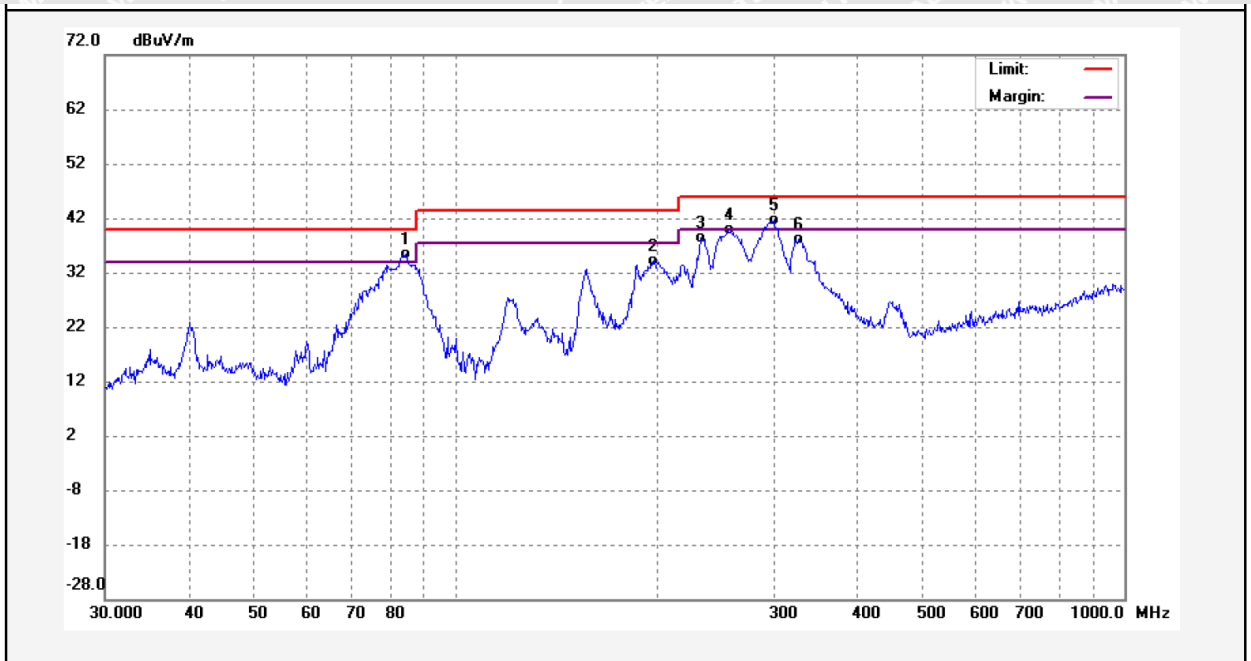


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	85.0889	25.73	10.66	36.39	40.00	-3.61	QP	
2	126.2400	25.76	10.59	36.35	43.50	-7.15	QP	
3	157.5588	21.91	10.32	32.23	43.50	-11.27	QP	
4	193.5012	19.21	12.74	31.95	43.50	-11.55	QP	
5	255.8922	19.68	15.71	35.39	46.00	-10.61	QP	
6	330.0791	17.84	16.53	34.37	46.00	-11.63	QP	





Horizontal Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	84.6129	24.79	10.60	35.39	40.00	-4.61	QP	
2	198.2400	21.16	13.02	34.18	43.50	-9.32	QP	
3	233.1851	23.94	14.37	38.31	46.00	-7.69	QP	
4	256.2514	24.07	15.71	39.78	46.00	-6.22	QP	
5	299.4208	25.33	16.41	41.74	46.00	-4.26	QP	
6	326.1671	21.70	16.48	38.18	46.00	-7.82	QP	



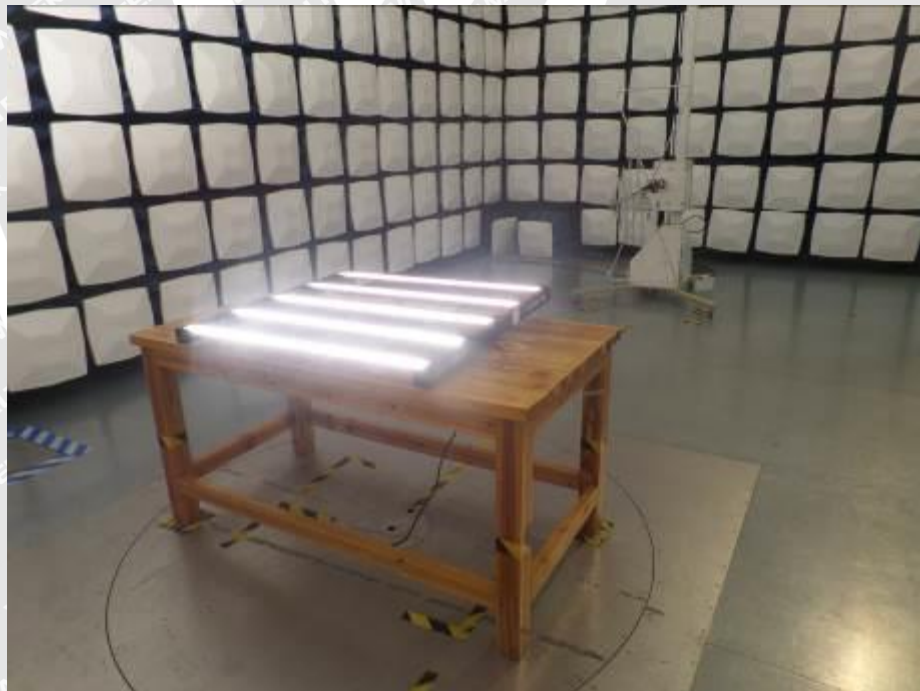


6 Photographs – Test Setup

6.1 Photograph – Conducted Emission Test Setup



6.2 Photograph – Radiated Emission Test Setup





7 Photographs – Constructional Details

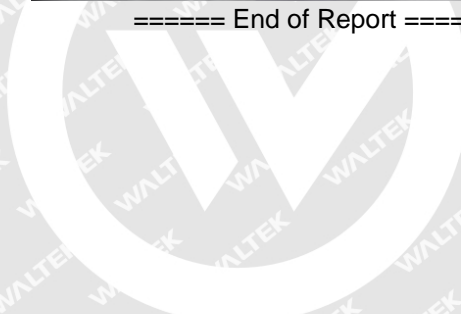
7.1 EUT – External View







==== End of Report =====



WALTEK