Product Service

EMC EMISSION - TEST REPORT

Report Number	: 708881503938-00-Part 1	Date of Issue:	November 03, 2015

Model	: BCW098 LED20/NW PSU L600, BCW098 LED20/CW PSU L600, BCW098 LED40/NW PSU L1200, BCW098 LED40/CW PSU L1200, BCW098 LED40/NW PSD L1200, BCW098 LED40/CW PSD L1200
Product Type	: LED Waterproof
Applicant	: Philips Lighting Luminaires (Shanghai) Co., Ltd
Manufacturer	: Philips Lighting Luminaires (Shanghai) Co., Ltd
License holder	: Philips Lighting Luminaires (Shanghai) Co., Ltd
Address	: 2F, Building 6, No.1805, Huyi Highway, Malu Town, Jiading District, 201801 Shanghai, P.R. China.

Test Result : ■ **Positive** ☐ **Negative**

Total pages including Appendices: 63

TÜV SÜD CERTIFICATION AND TESTING (CHINA) CO., LTD. SHANGHAI BRANCH reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. Jiangsu TÜV Product Service Ltd. Shanghai Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Jiangsu TÜV Product Service Ltd. Shanghai Branch issued reports.

DIRECTORY - EMISSIONS

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to the following regulations:

■ - EMC - Directive 2004/108/EC

☐ - EN 61000-6-3:2007+A1:2011
☐ - EN 61000-6-4:2007+A1:2011

☐ - EN 55011:2009+A1: 2010 ☐ - Group 1 ☐ - Group 2
☐ - Class A ☐ - Class B

☐ - EN 55012:2007+A1:2009

☐ - EN 55013:2001+A1:2003+A2:2006

☐ - EN 55014-1:2006+A1:2009+A2:2011 ☐ - Household appliances and similar
☐ - Electric tools
☐ - Others_____.

■ - EN 55015:2013

☐ - EN 55022:2010 ☐ - Class A ☐ - Class B

■ - EN 61000-3-2:2014
■ - EN 61000-3-3:2013
☐ - EN 61000-3-11:2000

Environmental Conditions In The Laboratory:

	Actual
Temperature:	: 24°C
Relative Humidity:	: 57%
Atmospheric Pressure:	: 1009mBar

Power Supply Utilized:

Power supply system : 220-240V~ / 50 or 60 Hz / 1ϕ

Statement of Measurement Uncertainty:

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Discipline	Frequency / Parameter	MU
Conducted Emission	0.15MHz to 30MHz	2.77 dB
Radiated Emission (Electric field)	30MHz to 200MHz	4.17 dB (Horizontal)
		4.02 dB (Vertical)
Radiated Emission (Electric field)	200MHz to 1GHz	3.38 dB (Horizontal)
		3.28 dB (Vertical)

Test site:

Audix Technology (shanghai) Co., Ltd.

Site Location:

3F 34Bldg 680 Guiping Rd, Caohejing Hi-Tech Park, Shanghai 200233, China

Symbol Definitions:

■ - Applicable
☐ - Not Applicable

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE*) measurements were performed at the following test location:

☐ - Test not applicable

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	ESCI	R&S	Test Receiver	100841
■-	ESH2-Z5	R&S	Artificial Mains Network (AMN)	843890/011
■ -	MP59B	Anritsu	50Ω Coaxial Switch	6200426389
■ -	E3	Audix	Software	SET002009804M592

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

☐ - Test not applicable

■ - Test Area – H

Testing was performed at a test distance of :

■ - 2 meters
☐ - 30 meters

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	ESCI	R&S	Test Receiver	100841
■ -	RF300	Laplace	Loop Antenna	5001
■ -	MP59B	Anritsu	50Ω Coaxial Switch	6200426389
■ -	E3	Audix	Software	SET002009804M592

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-300/1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

☐- Test not applicable

■ - Test Area – H

Testing was performed at a test distance of :

■ - 3 meters
☐- 10 meters

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	ESVS10	R&S	Test Receiver	844594/001
■ -	8447D	Agilent	Preamplifier	2944A10548
■ -	CBL6112D	TESEQ	Bi-log Antenna	23192
■ -	E7405A	Agilent	Spectrum	MY45106600
■ -	MP59B	Anritsu	50Ω Coaxial Switch	6200426390
■ -	E3	Audix	Software	SET002009912M295-2

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

■ - Test not applicable

☐ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
☐ -	MDS-21	Rohde & Schwarz	Absorbing Clamp	70-7/60-95-02
☐ -	ESVS 30	Rhode & Schwarz	EMI Test Receiver	70-7/63-95-02

Remarks: Test equipment used is calibrated on a regular basis.

Emissions Test Conditions: CONDUCTED EMISSIONS (Harmonics and Flicker)

The *Harmonic Current Emissions and Voltage Fluctuations and Flicker* measurements were performed at the following test location :

☐ - Test not applicable

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	PACS-1	CI	Power Analyzer	72626
■ -	5001IX	CI	AC Source	58478
■ -	CTS 3.0	CI	Software	Version 3.2.0.32

Remarks: Test equipment used is calibrated on a regular basis.

Equipment Under Test (EUT) Test Operation Mode - Emissions Tests:

The equipment under test was operated under the following conditions during emissions testing:

☐ - Standby

☐ - Test Program (H - Pattern)

☐ - Test Program (Color Bar)

☐ - Test Program (Customer Specified)

■ - Normal Operating Mode

■ - Light on, minimum light output, maximum light output.
Pre-tests are performed under 220-240V AC/50 or 60Hz, the worst test results are recorded.

Configuration of the equipment under test:

■ - See Constructional Data Form in Appendix B

■ - See Product Information Form(s) in Appendix B

The following peripheral devices and interface cables were connected during the testing:

■ -	Light Modulator (Philips)	Type :	BS0112350
☐ -		Type :	
☐ -		Type :	
☐ -		Type :	
☐ -		Type :	
☐ -		Type :	
☐ -		Type :	
☐ -		Type :	
☐ -		Type :	

■ - unshielded power cable

☐ - unshielded cables

☐ - shielded cables TUVPS.No.:

☐ - customer specific cables

☐ -

☐ -

Emissions Test Results:

Conducted Emissions, 9/150 kHz - 30 MHz

■ - PASS ☐ - FAIL ☐ - NOT APPLICABLE

Minimum limit margin >6 dB At 0.009-30 MHz

Maximum limit exceeding _____ dB At _____ MHz

Remarks: _____

Radiated Emissions (Magnetic Field), 9 kHz - 30 MHz

■ - PASS ☐ - FAIL ☐ - NOT APPLICABLE

Minimum limit margin >6 dB At 0.009-30 MHz

Maximum limit exceeding _____ dB At _____ MHz

Remarks: _____

Interference Power at the Mains and Interface Cables, 30 MHz - 300 MHz

☐ - PASS ☐ - FAIL ■ - NOT APPLICABLE

Minimum limit margin _____ dB At _____ MHz

Maximum limit exceeding -- dB At -- MHz

Comply with the limits reduces by Table 2b of EN 55014-1? ☐ - YES ☐ - NO ☐ - N/A

Remarks: _____

Radiated Emissions (Electric Field), ■ - 30 MHz - 300 MHz, ☐ - 300MHz – 1000MHz

■ - PASS ☐ - FAIL ☐ - NOT APPLICABLE

Minimum limit margin 3.95 dB At 167.74 MHz

Maximum limit exceeding _____ dB At _____ MHz

Remarks: _____

Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ - PASS ☐ - FAIL ☐ - NOT APPLICABLE

Harmonic measurement exceeding limit _____ Above At _____ Harmonic

Flicker measurement exceeding limit _____ Above The _____ Requirement

Remarks: _____

GENERAL REMARKS:

According to the client's declaration, Model BCW098 LED20/NW PSU L600 and BCW098 LED20/CW PSU L600 are identical except the model name;
Model BCW098 LED40/NW PSU L1200 and BCW098 LED40/CW PSU L1200 are identical except the model name;
Model BCW098 LED40/NW PSD L1200 and BCW098 LED40/CW PSD L1200 are identical except the model name.
So model BCW098 LED20/NW PSU L600, BCW098 LED40/CW PSU L1200 and BCW098 LED40/NW PSD L1200 were chosen to perform all the tests.

SUMMARY:

All tests according to the regulations cited on page 3 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements cited on page 3.

☐ - **Does not** fulfill the general approval requirements cited on page 3.

Testing Start Date: September 26, 2015

Testing End Date: October 09, 2015

- TÜV SÜD CERTIFICATION AND TESTING (CHINA) CO., LTD. SHANGHAI BRANCH-

Reviewed by: Prepared by:

Liping XUE
Review Engineer

Wenwen CHENG
Project Engineer

Photograph of Test Setup:
Conducted Emissions : 9/150/450 kHz - 30 MHz

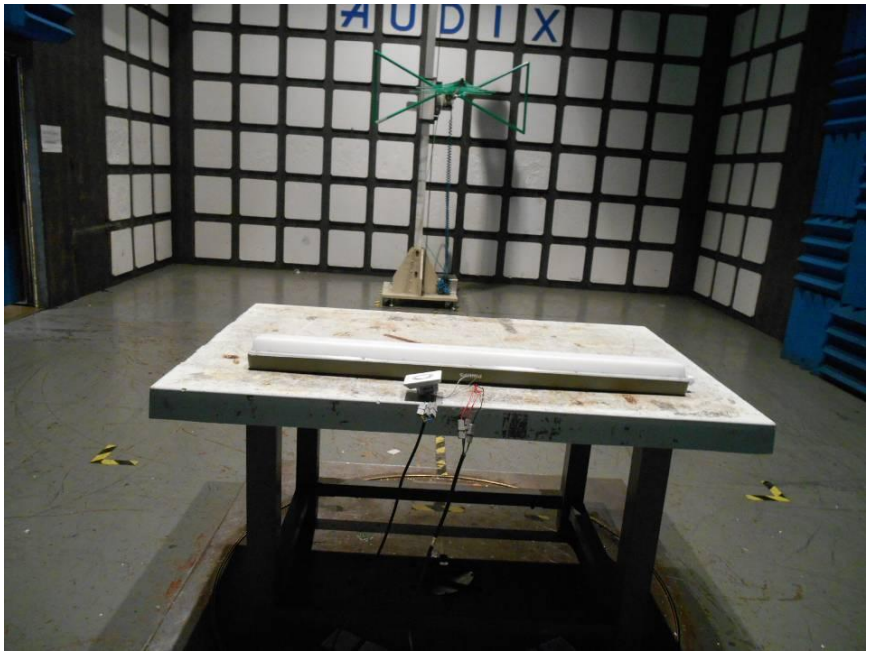
☐ **- Test not applicable**

Photograph of Test Setup:
Inteference Power 30 MHz - 300 MHz

■ - Test not applicable

Photograph of Test Setup:
Radiated Emissions 0.009-30MHz & 30 MHz - 300 MHz

☐ **- Test not applicable**



Photograph of Test Setup:
Harmonic Current/Voltage Fluctuations and Flicker

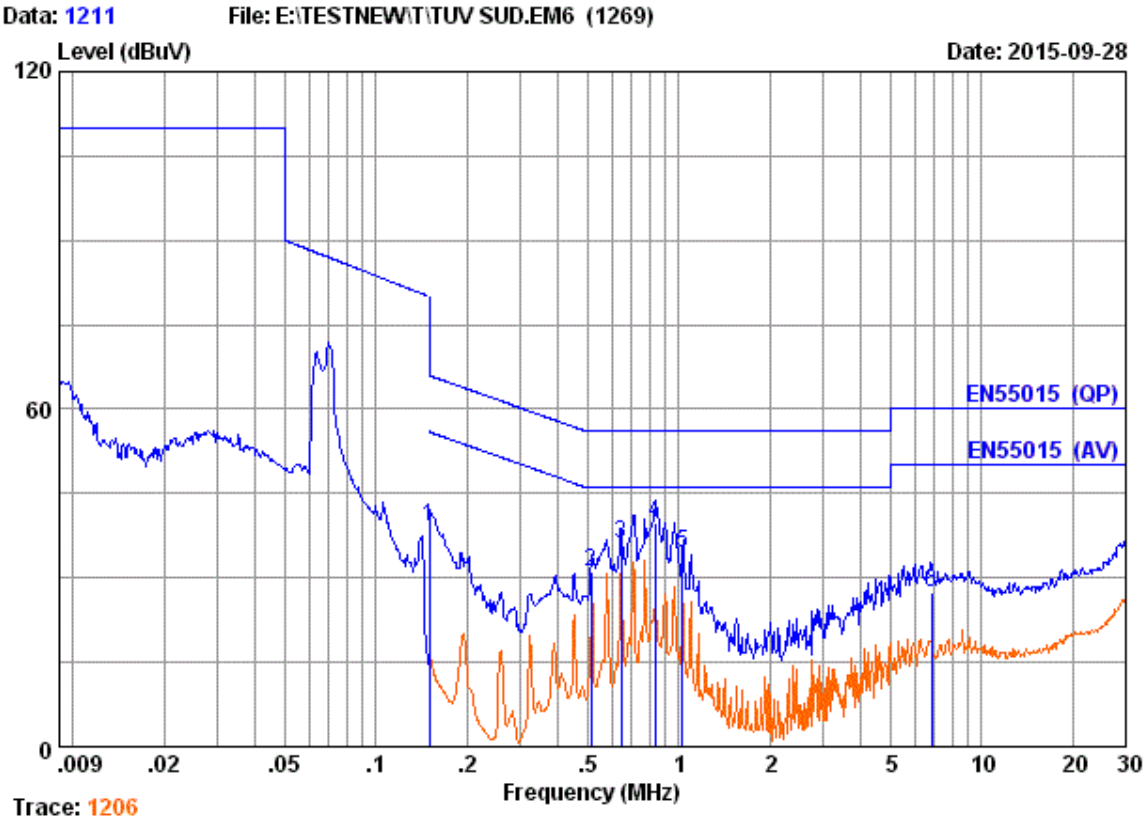
☐ - **Test not applicable**

Appendix A

Test Data Sheets

Conducted Emissions

BCW098 LED20/NW PSU L600



Trace: 1206

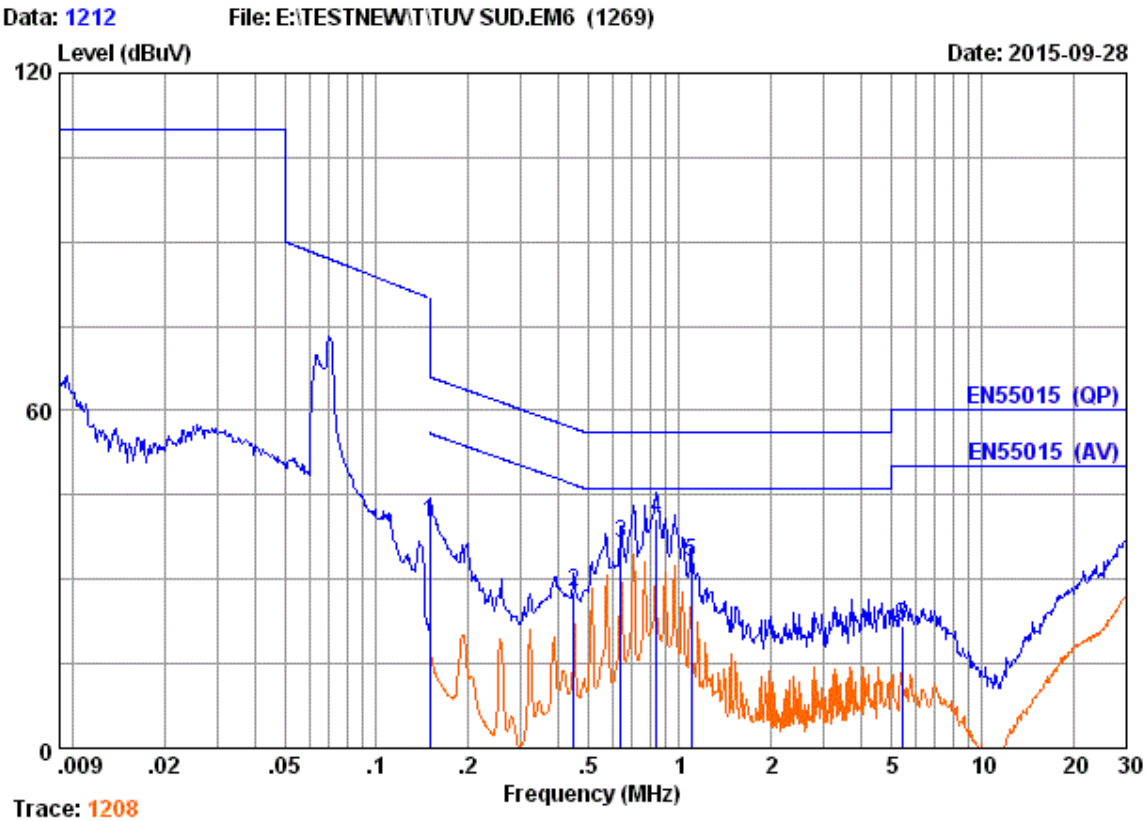
Site no : Audix(Shanghai) Shielded1 Data no :1211
AMN : ESH2-Z5-2015 AMN Phase :LINE
Limit : EN55015 (QP)
Env/Ins : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED20/NW PSU L 600
S/N : E1509986-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.11	0.05	39.00	39.16	66.00	26.84	QP
2	0.516	0.13	0.08	30.80	31.01	56.00	24.99	QP
3	0.645	0.13	0.08	35.80	36.01	56.00	19.99	QP
4	0.838	0.14	0.09	39.50	39.73	56.00	16.27	QP
5	1.032	0.15	0.09	34.30	34.54	56.00	21.46	QP
6	6.847	0.24	0.18	26.90	27.32	60.00	32.68	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Conducted Emissions

BCW098 LED20/NW PSU L600



Trace: 1208

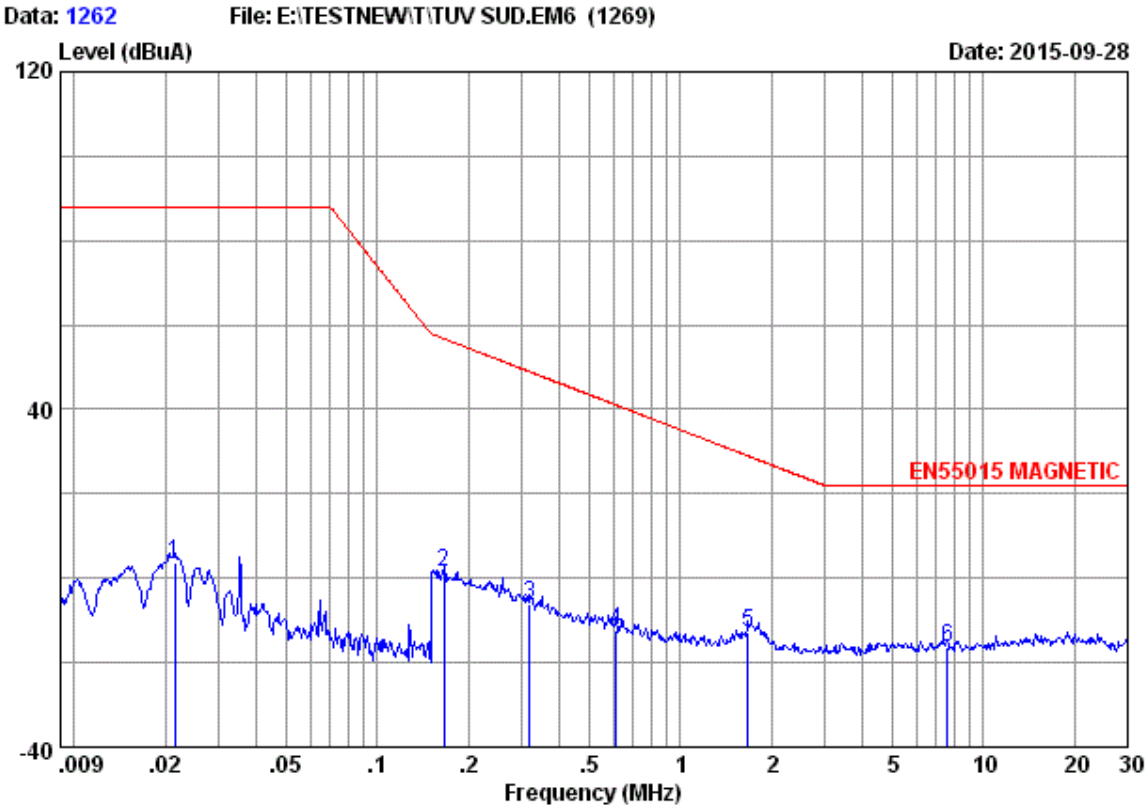
Site no	: Audix(Shanghai) Shielded1	Data no	:1212
AMN	: ESH2-Z5-2015	AMN Phase	:NEUTRAL
Limit	: EN55015 (QP)		
Env/Ins	: 22'C 48%RH / ESCI	Engineer	:Eric
EUT	: LED Waterproof		
M/N	: BCW098 LED20/NW PSU L 600		
S/N	: E1509986-01/01		
Power Rating	: 230V/50Hz		
Test Mode	: Lighting		

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.11	0.05	40.00	40.16	66.00	25.84	QP
2	0.449	0.13	0.08	27.50	27.71	56.89	29.18	QP
3	0.640	0.14	0.08	36.20	36.42	56.00	19.58	QP
4	0.839	0.15	0.09	40.49	40.73	56.00	15.27	QP
5	1.096	0.15	0.10	33.00	33.25	56.00	22.75	QP
6	5.455	0.27	0.16	21.20	21.63	60.00	38.37	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Radiated Emissions (Magnetic Field)

BCW098 LED20/NW PSU L600



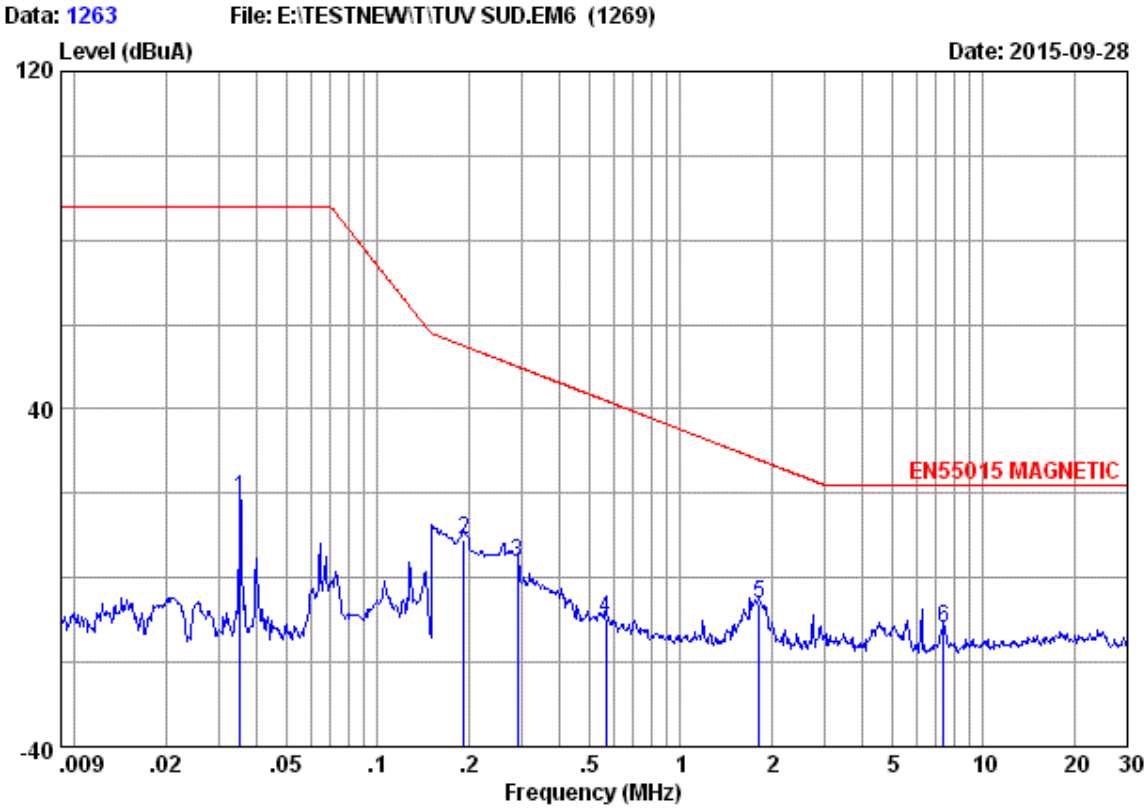
Site no : Audix(Shanghai) Shielded1 Data no. :1262
Antenna. : RF 300 2015 Antenna Phase:A
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED20/NW PSU L 600
S/N : E1509986-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.021	-5.93	0.05	9.72	3.84	88.00	84.16
2	0.166	-5.77	0.05	7.12	1.40	56.81	55.41
3	0.319	-10.59	0.07	4.45	-6.07	48.92	54.99
4	0.616	-18.19	0.08	5.74	-12.37	41.02	53.39
5	1.671	-21.64	0.12	8.55	-12.97	29.03	42.00
6	7.616	-21.78	0.19	5.08	-16.51	22.00	38.51

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Magnetic Field)

BCW098 LED20/NW PSU L600



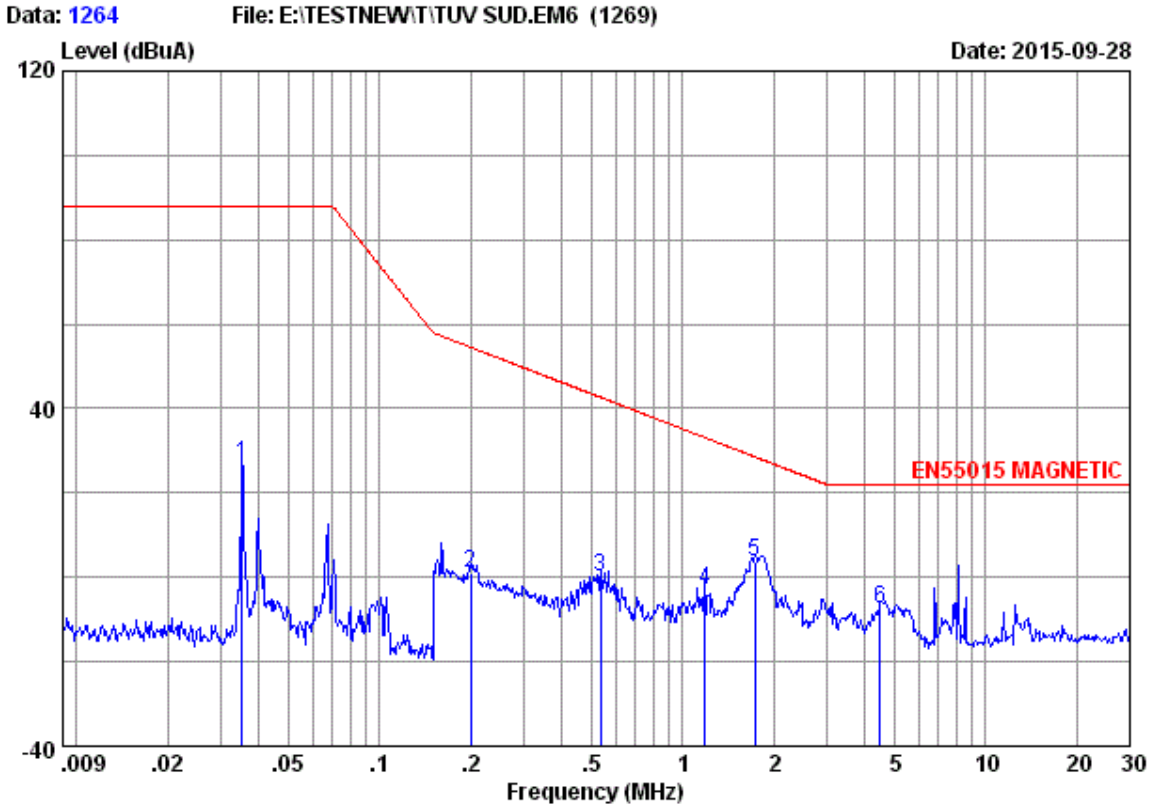
Site no : Audix(Shanghai) Shielded1 Data no. :1263
Antenna. : RF 300 2015 Antenna Phase:B
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED20/NW PSU L 600
S/N : E1509986-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.035	-5.26	0.05	23.83	18.62	88.00	69.38
2	0.193	-6.72	0.06	15.80	9.14	54.96	45.82
3	0.290	-9.61	0.07	13.24	3.70	50.09	46.39
4	0.568	-17.96	0.08	8.37	-9.51	42.00	51.51
5	1.827	-21.82	0.13	15.34	-6.35	27.96	34.31
6	7.433	-21.87	0.19	9.71	-11.97	22.00	33.97

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Magnetic Field)

BCW098 LED20/NW PSU L600



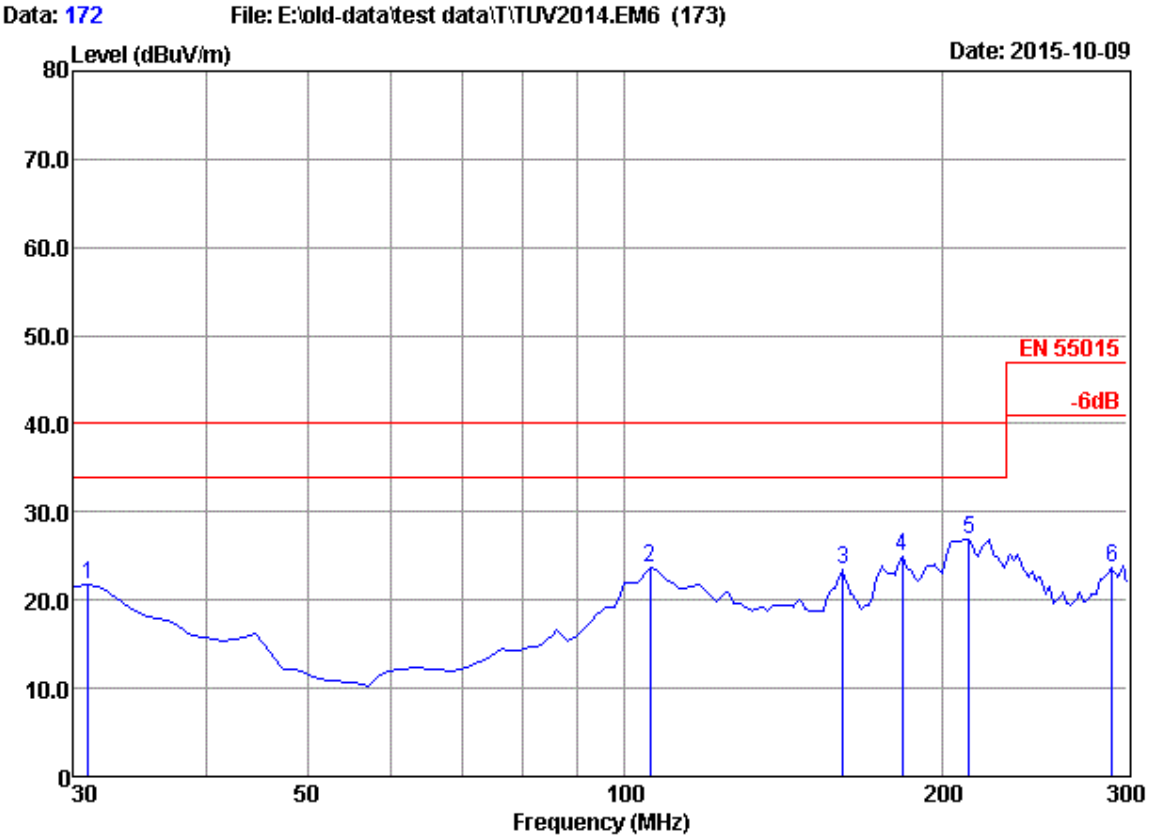
Site no : Audix(Shanghai) Shielded1 Data no. :1264
Antenna. : RF 300 2015 Antenna Phase:C
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED20/NW PSU L 600
S/N : E1509986-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.035	-5.26	0.05	31.89	26.68	88.00	61.32
2	0.200	-6.72	0.06	7.80	1.14	54.57	53.43
3	0.537	-17.73	0.08	17.60	-0.05	42.68	42.73
4	1.189	-21.18	0.10	18.11	-2.97	33.13	36.10
5	1.740	-21.73	0.13	25.08	3.48	28.55	25.07
6	4.495	-22.65	0.15	14.84	-7.66	22.00	29.66

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Electric Field)

BCW098 LED20/NW PSU L600



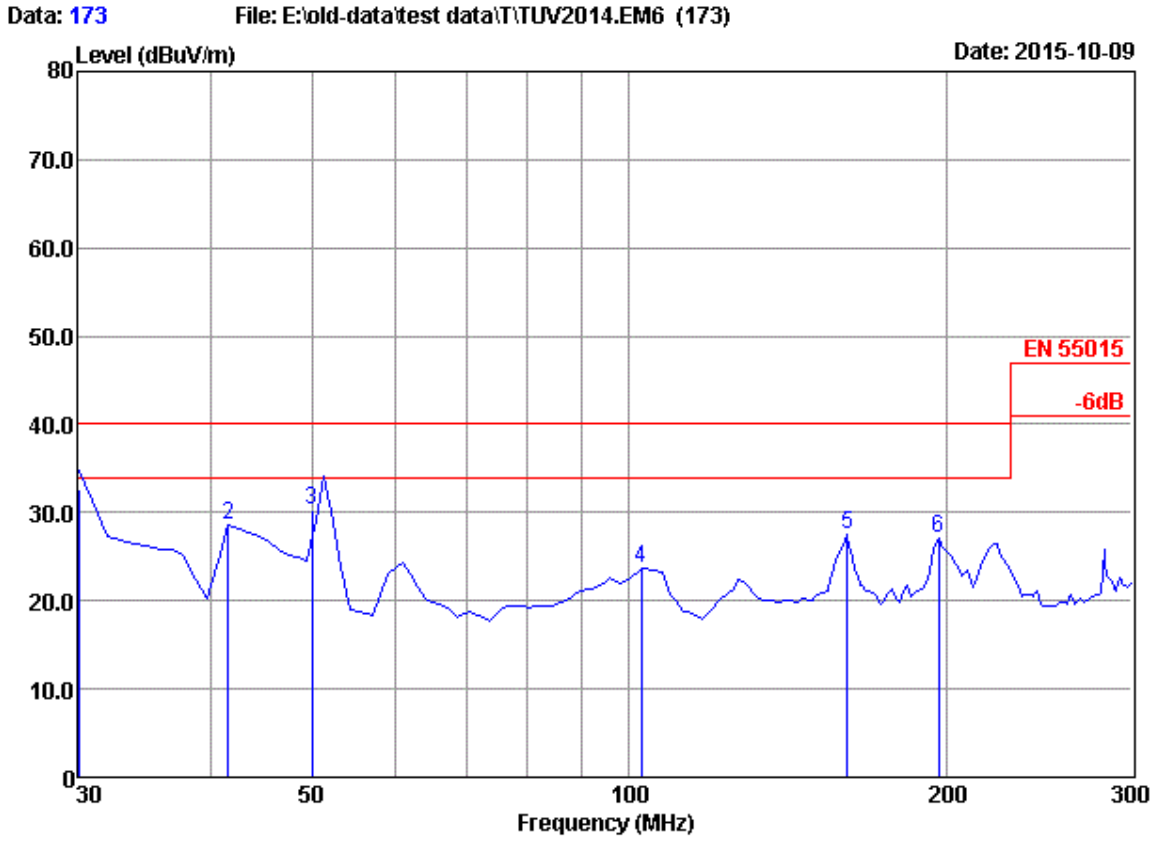
Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015 Data no. :172
Limit :EN 55015 Ant. pol. :HORIZONTAL
Env. / Ins. :22'C 60%RH/ESCI Engineer :Henry
EUT :LED Waterproof
M/N :BCW098 LED20/NW PSU L 600
S/N :E1509986-01-01
Power Rating:230V/50Hz
Test Mode :Lighting

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.97	18.15	0.64	2.99	21.78	40.00	18.22
2	105.66	12.52	1.36	9.81	23.69	40.00	16.31
3	160.95	11.13	1.72	10.70	23.55	40.00	16.45
4	183.26	10.50	1.87	12.65	25.02	40.00	14.98
5	212.36	10.10	2.02	14.72	26.84	40.00	13.16
6	289.96	13.60	2.49	7.52	23.61	47.00	23.39

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Radiated Emissions (Electric Field)

BCW098 LED20/NW PSU L600



Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015 Data no. :173
Limit :EN 55015 Ant. pol. :VERTICAL
Env. / Ins. :22'C 60%RH/ESCI Engineer :Henry
EUT :LED Waterproof
M/N :BCW098 LED20/NW PSU L 600
S/N :E1509986-01-01
Power Rating:230V/50Hz
Test Mode :Lighting

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.00	18.90	0.63	13.18	32.71	40.00	7.29
2	41.64	12.41	0.75	15.49	28.65	40.00	11.35
3	50.04	7.60	0.81	21.80	30.21	40.00	9.79
4	102.75	12.41	1.34	10.01	23.76	40.00	16.24
5	160.95	11.13	1.72	14.67	27.52	40.00	12.48
6	196.84	9.97	1.95	15.11	27.03	40.00	12.97

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Harmonic Current Emissions

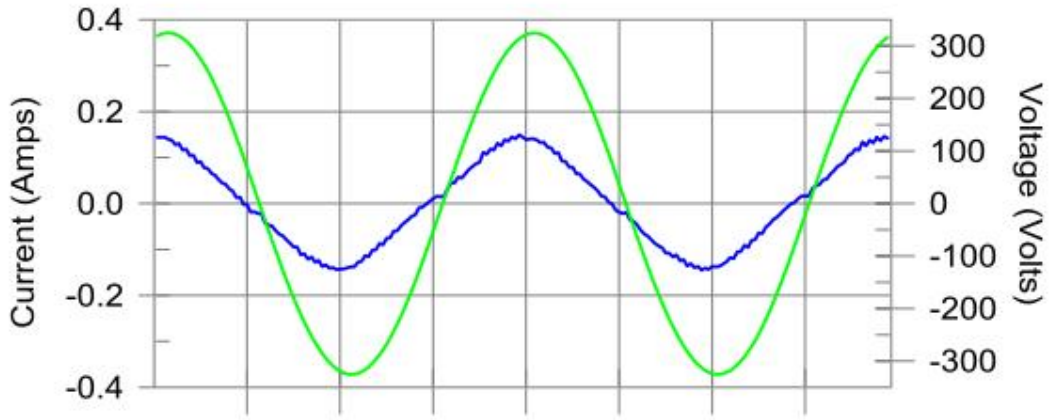
BCW098 LED20/NW PSU L600

Harmonics – Class-C (< 25W) per Ed. 4.0 (2014)(Run time)

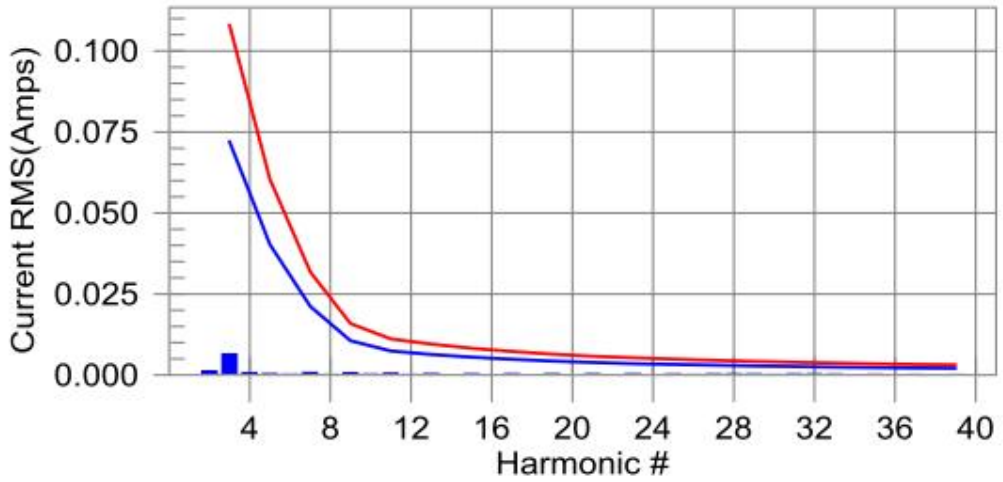
EUT: LED Waterproof — Tested by: Tency
Test category: Class-C per Ed. 4.0 (2014) (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 16:42:18 — End time: 16:45:09
Test duration (min): 2.5 — Data file name: H-000313.cts_data
Comment: BCW098 LED20/NW PSU L 600 — S/N: E1509986-01/01
Customer: TUV SUD

Test Result: Pass — Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line (Table-3 Class-D) — **European Limits**



Test result: Pass

Harmonic Current Emissions

BCW098 LED20/NW PSU L600

Current Test Result Summary (Run time)

EUT: LED Waterproof — Tested by: Tency
Test category: Class-C per Ed. 4.0 (2014) (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 16:42:18 — End time: 16:45:09
Test duration (min): 2.5 — Data file name: H-000313.cts_data
Comment: BCW098 LED20/NW PSU L 600 — S/N: E1509986-01/01
Customer: TUV SUD

Test Result: Pass — Source qualification: Normal
THC(A): 0.000 — I-THD(%): 0.0 — POHC(A): 0.000 — POHC Limit(A): 0.000
Highest parameter values during test:

V_RMS (Volts):	229.97	Frequency(Hz):	50.00
I_Peak (Amps):	0.158	I_RMS (Amps):	0.095
I_Fund (Amps):	0.095	Crest Factor:	1.668
Power (Watts):	21.2	Power Factor:	0.971

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.000	N/A	0.001	0.000	N/A	Pass
3	0.006	0.072	9.0	0.007	0.108	6.8	Pass
4	0.001	0.000	N/A	0.001	0.000	N/A	Pass
5	0.000	0.040	N/A	0.001	0.060	N/A	Pass
6	0.000	0.000	N/A	0.000	0.000	N/A	Pass
7	0.001	0.021	N/A	0.001	0.032	N/A	Pass
8	0.000	0.000	N/A	0.000	0.000	N/A	Pass
9	0.001	0.011	N/A	0.001	0.016	N/A	Pass
10	0.000	0.000	N/A	0.000	0.000	N/A	Pass
11	0.000	0.007	N/A	0.001	0.011	N/A	Pass
12	0.000	0.000	N/A	0.000	0.000	N/A	Pass
13	0.000	0.006	N/A	0.001	0.010	N/A	Pass
14	0.000	0.000	N/A	0.000	0.000	N/A	Pass
15	0.000	0.006	N/A	0.000	0.008	N/A	Pass
16	0.000	0.000	N/A	0.000	0.000	N/A	Pass
17	0.000	0.005	N/A	0.000	0.007	N/A	Pass
18	0.000	0.000	N/A	0.000	0.000	N/A	Pass
19	0.000	0.004	N/A	0.000	0.006	N/A	Pass
20	0.000	0.000	N/A	0.000	0.000	N/A	Pass
21	0.000	0.004	N/A	0.000	0.006	N/A	Pass
22	0.000	0.000	N/A	0.000	0.000	N/A	Pass
23	0.000	0.004	N/A	0.000	0.005	N/A	Pass
24	0.000	0.000	N/A	0.000	0.000	N/A	Pass
25	0.000	0.003	N/A	0.000	0.005	N/A	Pass
26	0.000	0.000	N/A	0.000	0.000	N/A	Pass
27	0.000	0.003	N/A	0.000	0.005	N/A	Pass
28	0.000	0.000	N/A	0.000	0.000	N/A	Pass
29	0.000	0.003	N/A	0.000	0.004	N/A	Pass
30	0.000	0.000	N/A	0.000	0.000	N/A	Pass
31	0.000	0.003	N/A	0.000	0.004	N/A	Pass
32	0.000	0.000	N/A	0.000	0.000	N/A	Pass
33	0.000	0.002	N/A	0.000	0.004	N/A	Pass
34	0.000	0.000	N/A	0.000	0.000	N/A	Pass
35	0.000	0.002	N/A	0.000	0.003	N/A	Pass
36	0.000	0.000	N/A	0.000	0.000	N/A	Pass
37	0.000	0.002	N/A	0.000	0.003	N/A	Pass
38	0.000	0.000	N/A	0.000	0.000	N/A	Pass
39	0.000	0.002	N/A	0.000	0.003	N/A	Pass
40	0.000	0.000	N/A	0.000	0.000	N/A	Pass

Note: Dynamic limits were applied for this test (Class C < 25 Watts).

Voltage Fluctuations and Flicker

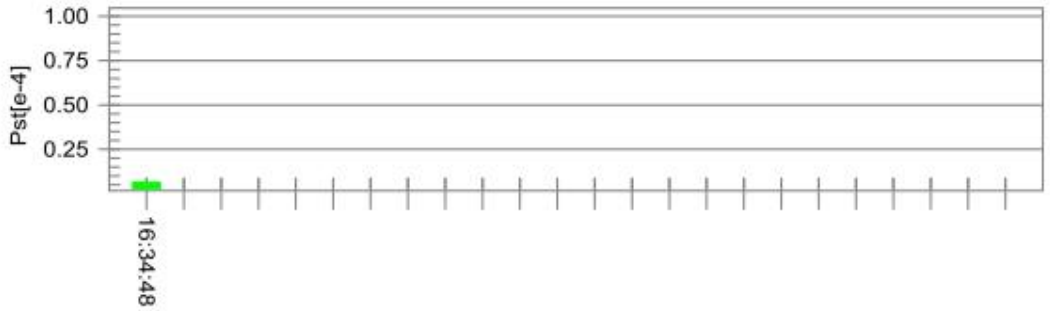
BCW098 LED20/NW PSU L600

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

EUT: LED Waterproof — Tested by: Tency
Test category: dt,dmax,dc and Pst (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 16:24:18 — End time: 16:34:49
Test duration (min): 10 — Data file name: F-000312.cts_data
Comment: BCW098 LED20/NW PSU L 600 — S/N: E1509986-01/01
Customer: TUV SUD

Test Result: Pass — Status: Test Completed

Pst and limit line — European Limits

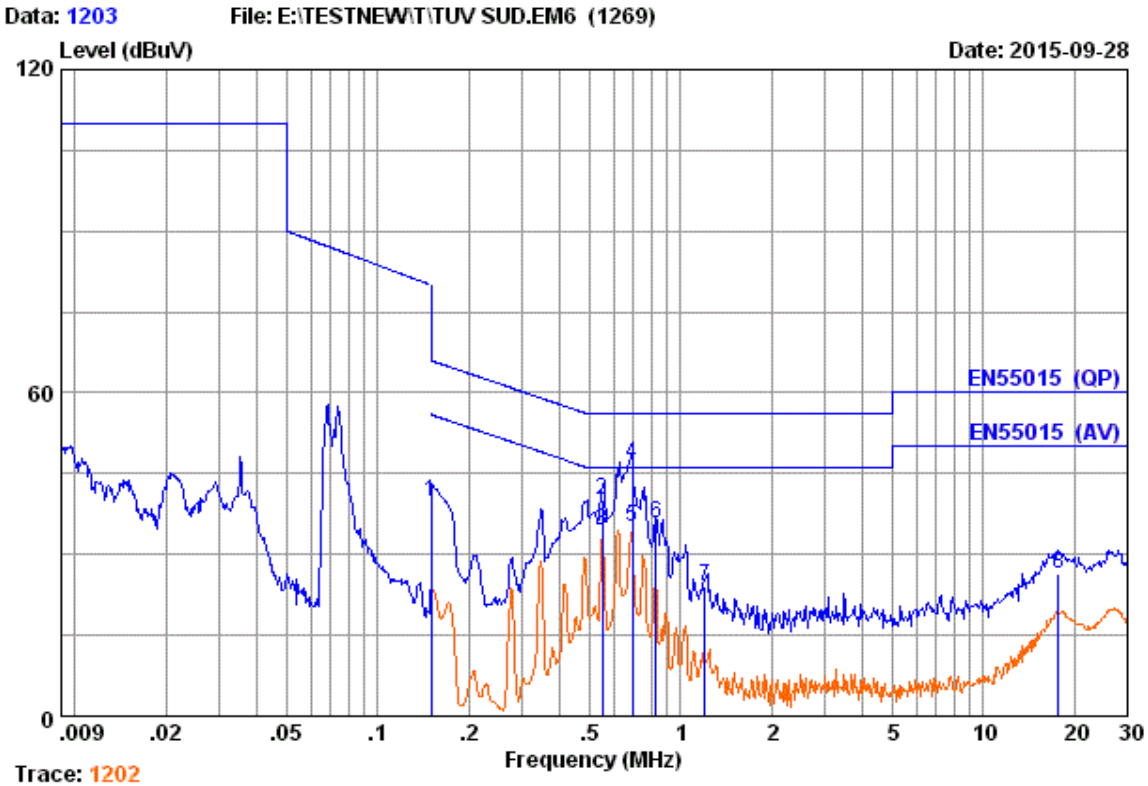


Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.81			
Highest dt (%):	0.00	Test limit (%):	N/A	N/A
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.04	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass

Conducted Emissions

BCW098 LED40/CW PSU L1200



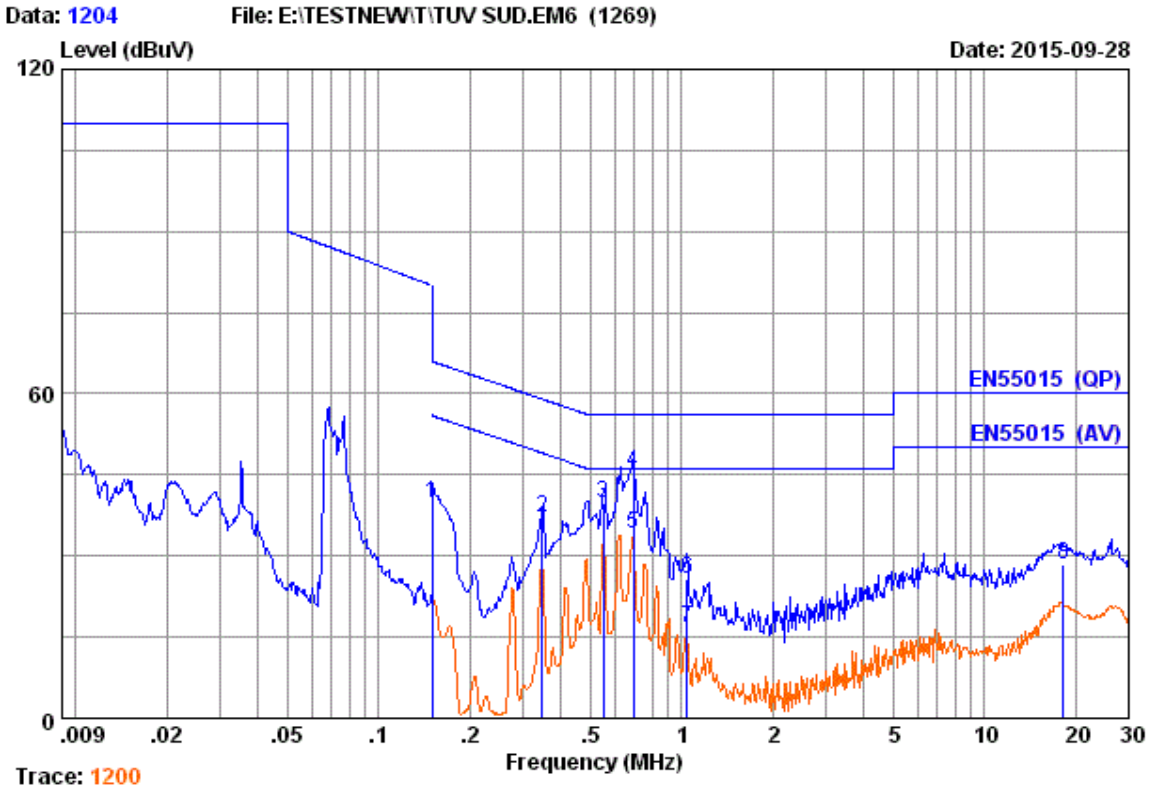
Site no : Audix(Shanghai) Shielded1 Data no :1203
AMN : ESH2-Z5-2015 AMN Phase :LINE
Limit : EN55015 (QP)
Env/Ins : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/CW PSU L 1200
S/N : E1509988-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.11	0.05	39.60	39.76	66.00	26.24	QP
2	0.552	0.13	0.08	40.00	40.21	56.00	15.79	QP
3	0.552	0.13	0.08	34.20	34.41	46.00	11.59	Average
4	0.696	0.13	0.08	46.50	46.71	56.00	9.29	QP
5	0.696	0.13	0.08	34.80	35.01	46.00	10.99	Average
6	0.833	0.14	0.09	35.50	35.73	56.00	20.27	QP
7	1.203	0.16	0.10	23.90	24.16	56.00	31.84	QP
8	17.730	0.34	0.28	25.80	26.42	60.00	33.58	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Conducted Emissions

BCW098 LED40/CW PSU L1200



Trace: 1200

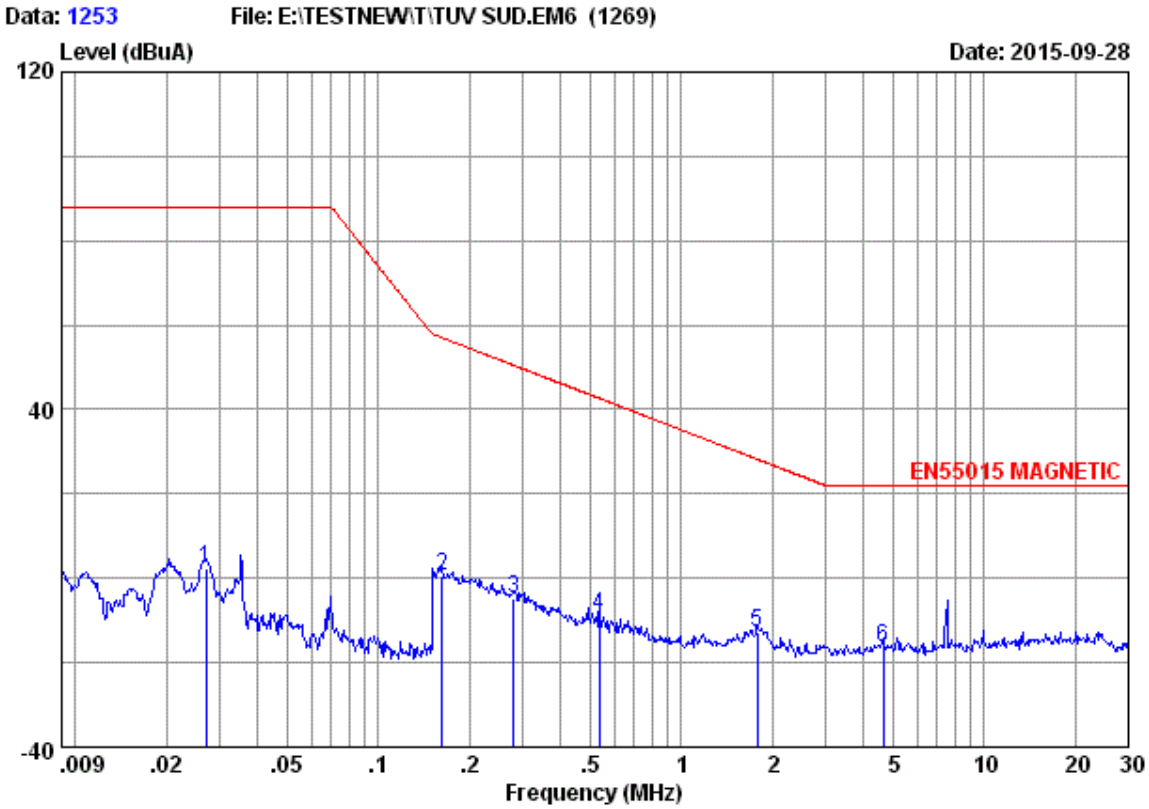
Site no	: Audix(Shanghai) Shielded1	Data no	:1204
AMN	: ESH2-Z5-2015	AMN Phase	:NEUTRAL
Limit	: EN55015 (QP)		
Env/Ins	: 22'C 48%RH / ESCI	Engineer	:Eric
EUT	: LED Waterproof		
M/N	: BCW098 LED40/CW PSU L 1200		
S/N	: E1509988-01/01		
Power Rating	: 230V/50Hz		
Test Mode	: Lighting		

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.11	0.05	39.50	39.66	66.00	26.34	QP
2	0.348	0.12	0.07	37.01	37.20	59.01	21.81	QP
3	0.554	0.13	0.08	39.60	39.81	56.00	16.19	QP
4	0.694	0.14	0.08	45.10	45.32	56.00	10.68	QP
5	0.694	0.14	0.08	33.80	34.02	46.00	11.98	Average
6	1.043	0.15	0.09	25.50	25.74	56.00	30.26	QP
7	1.043	0.15	0.09	16.60	16.84	46.00	29.16	Average
8	18.190	0.65	0.28	27.50	28.43	60.00	31.57	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Radiated Emissions (Magnetic Field)

BCW098 LED40/CW PSU L1200



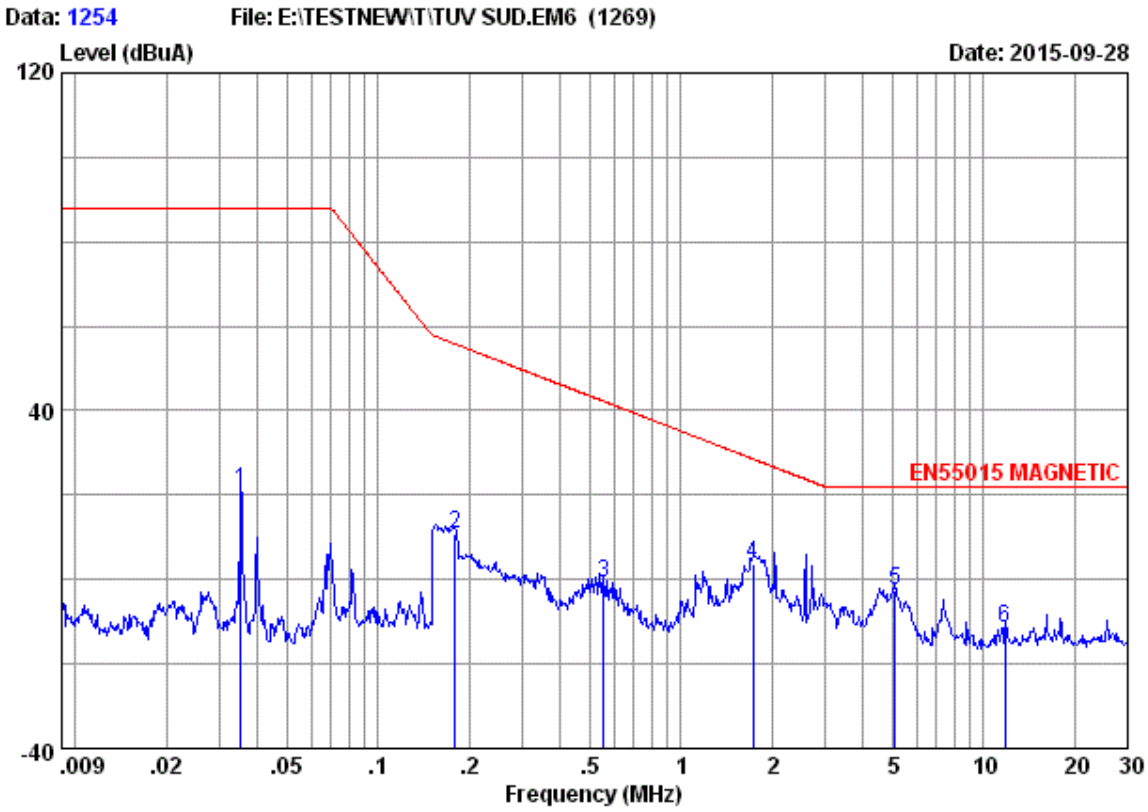
Site no : Audix(Shanghai) Shielded1 Data no. :1253
Antenna. : RF 300 2015 Antenna Phase:A
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/CW PSU L 1200
S/N : E1509988-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.027	-5.26	0.05	7.56	2.35	88.00	85.65
2	0.163	-5.77	0.05	6.35	0.63	57.01	56.38
3	0.281	-9.61	0.07	4.72	-4.82	50.48	55.30
4	0.537	-17.73	0.08	8.86	-8.79	42.68	51.47
5	1.783	-21.76	0.13	8.69	-12.94	28.25	41.19
6	4.644	-22.66	0.15	6.20	-16.31	22.00	38.31

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Magnetic Field)

BCW098 LED40/CW PSU L1200



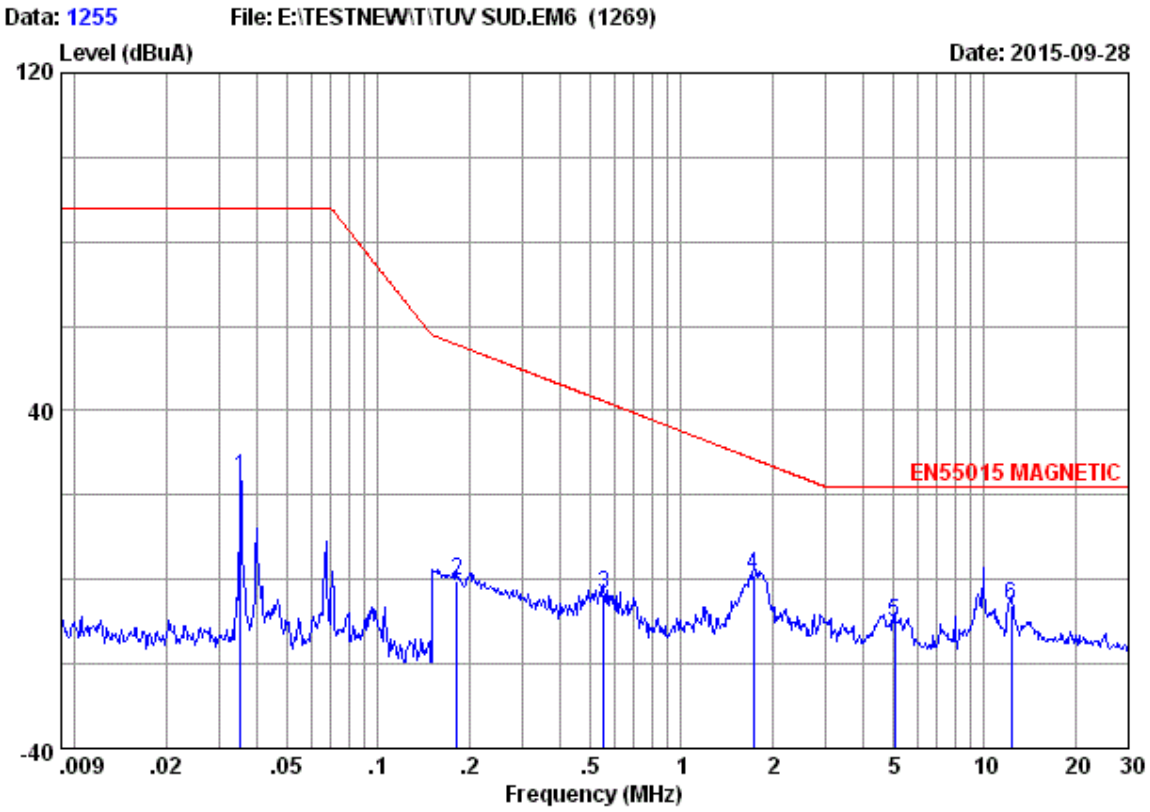
Site no : Audix(Shanghai) Shielded1 Data no. :1254
Antenna. : RF 300 2015 Antenna Phase:B
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/CW PSU L 1200
S/N : E1509988-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.035	-5.26	0.05	26.08	20.87	88.00	67.13
2	0.180	-6.72	0.06	17.25	10.59	55.84	45.25
3	0.554	-17.73	0.08	16.75	-0.90	42.29	43.19
4	1.740	-21.73	0.13	25.21	3.61	28.55	24.94
5	5.118	-22.66	0.15	19.95	-2.56	22.00	24.56
6	11.803	-19.78	0.24	8.01	-11.53	22.00	33.53

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Magnetic Field)

BCW098 LED40/CW PSU L1200



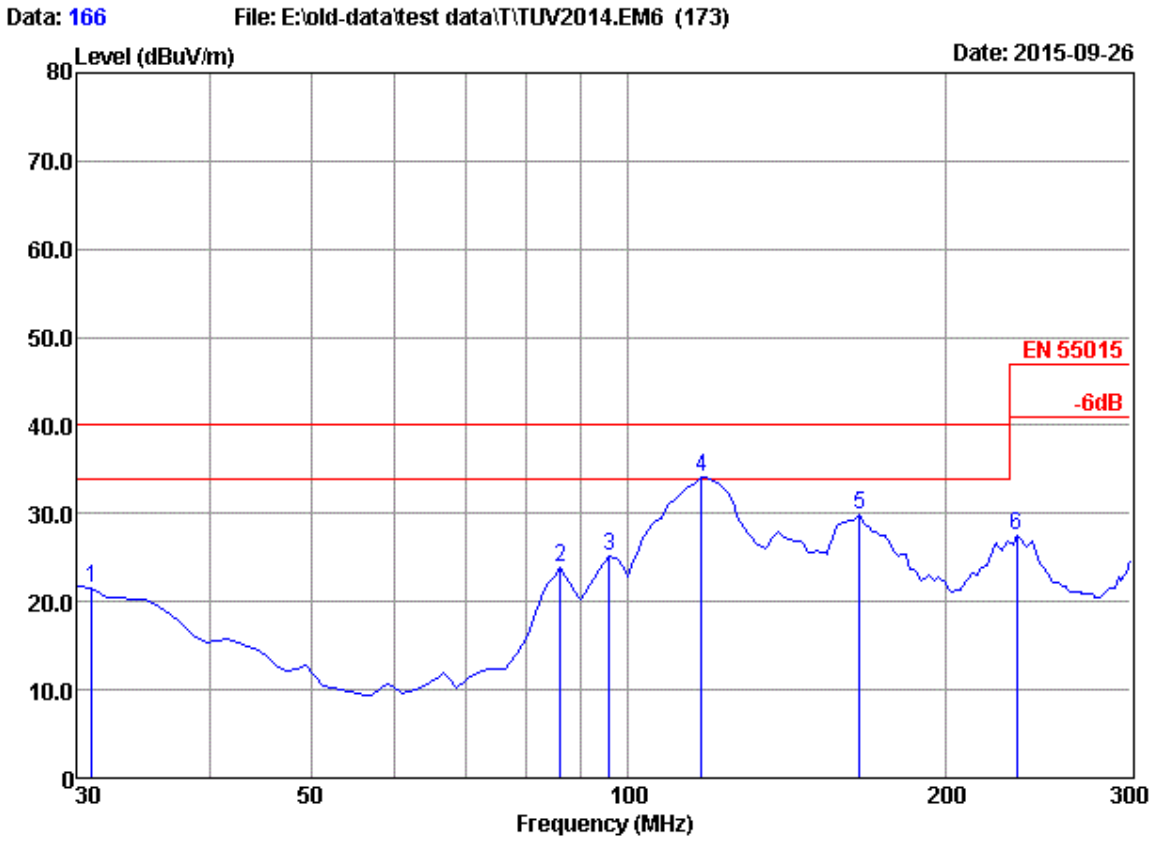
Site no : Audix(Shanghai) Shielded1 Data no. :1255
Antenna. : RF 300 2015 Antenna Phase:C
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/CW PSU L 1200
S/N : E1509988-01/01
Power Rating : 230V/50Hz
Test Mode : Lighting

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.035	-5.26	0.05	29.18	23.97	88.00	64.03
2	0.182	-6.72	0.06	6.35	-0.31	55.64	55.95
3	0.554	-17.73	0.08	14.32	-3.33	42.29	45.62
4	1.740	-21.73	0.13	22.66	1.06	28.55	27.49
5	5.077	-22.67	0.15	12.54	-9.98	22.00	31.98
6	12.291	-19.68	0.24	13.42	-6.02	22.00	28.02

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Electric Field)

BCW098 LED40/CW PSU L1200



Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015
Limit :EN 55015
Env. / Ins. :22'C 60%RH/ESCI
EUT :LED Waterproof
M/N :BCW098 LED40/CW PSU L 1200
S/N :E1509988-01/01
Power Rating:230V/50Hz
Test Mode :Lighting

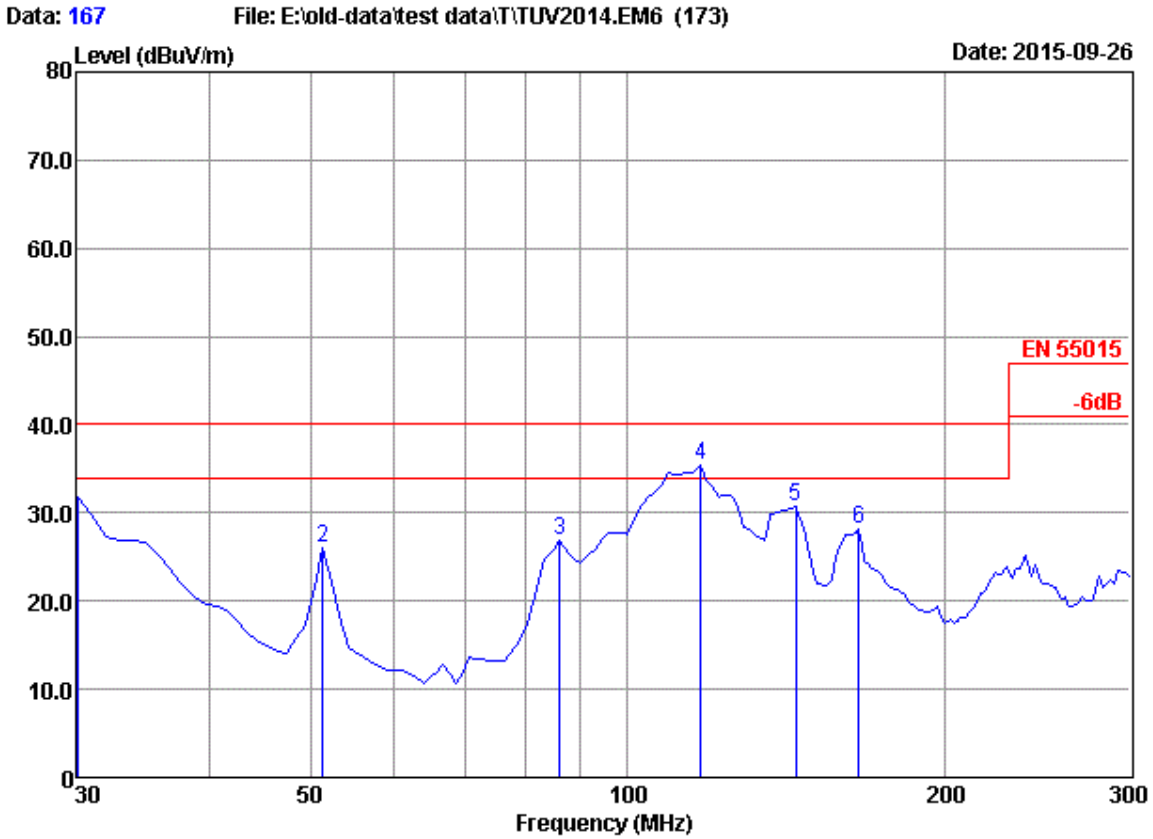
Data no. :166
Ant. pol. :HORIZONTAL
Engineer :Henry

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.97	18.15	0.64	2.67	21.46	40.00	18.54
2	86.26	9.95	1.16	12.70	23.81	40.00	16.19
3	95.96	11.84	1.27	12.09	25.20	40.00	14.80
4	117.30	12.75	1.44	20.00	34.19	40.00	5.81
5	165.80	11.24	1.75	16.82	29.81	40.00	10.19
6	233.70	11.36	2.10	14.01	27.47	47.00	19.53

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Radiated Emissions (Electric Field)

BCW098 LED40/CW PSU L1200



Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015 Data no. :167
Limit :EN 55015 Ant. pol. :VERTICAL
Env. / Ins. :22'C 60%RH/ESCI Engineer :Henry
EUT :LED Waterproof
M/N :BCW098 LED40/CW PSU L 1200
S/N :E1509988-01/01
Power Rating:230V/50Hz
Test Mode :Lighting

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.00	18.90	0.63	12.15	31.68	40.00	8.32
2	51.34	7.27	0.82	17.93	26.02	40.00	13.98
3	86.26	9.95	1.16	15.70	26.81	40.00	13.19
4	117.30	12.75	1.44	21.16	35.35	40.00	4.65
5	144.46	12.15	1.60	16.91	30.66	40.00	9.34
6	165.80	11.24	1.75	15.09	28.08	40.00	11.92

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Harmonic Current Emissions

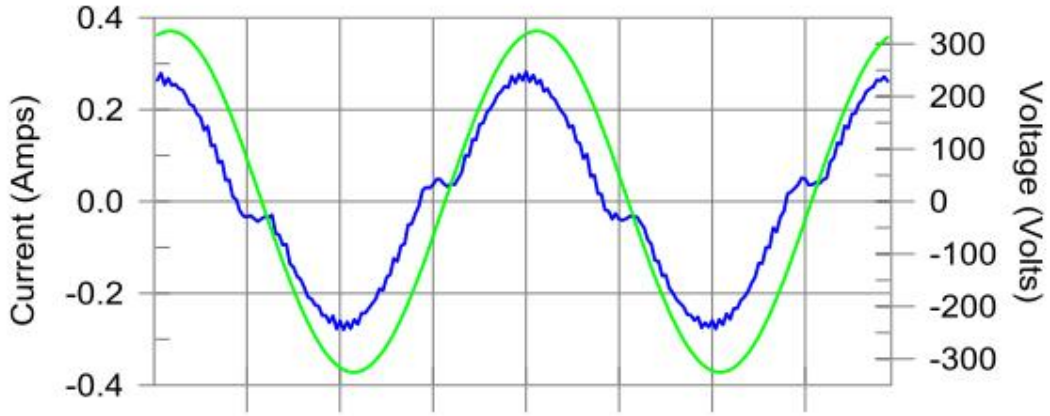
BCW098 LED40/CW PSU L1200

Harmonics – Class-C per Ed. 4.0 (2014)(Run time)

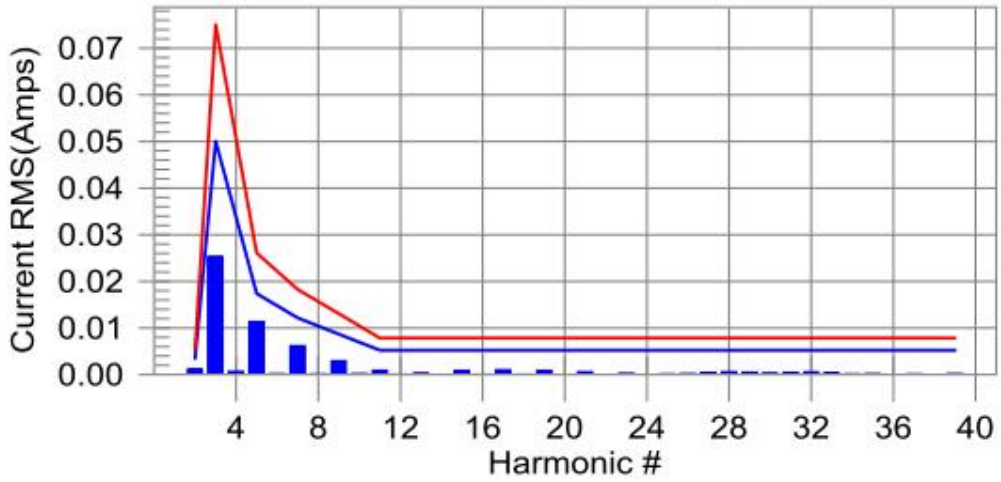
EUT: LED Waterproof — Tested by: Tency
Test category: Class-C per Ed. 4.0 (2014) (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 15:32:39 — End time: 15:35:30
Test duration (min): 2.5 — Data file name: H-000307.cts_data
Comment: BCW098 LED40/NW PSD L 1200 — S/N: E1509987-01/01
Customer: TUV SUD

Test Result: Pass — Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line **European Limits**



Test result: Pass Worst harmonics H5-65.6% of 100% limit, H5-44.5% of 150% limit.

Harmonic Current Emissions

BCW098 LED40/CW PSU L1200

Current Test Result Summary (Run time)

EUT: LED Waterproof — Tested by: Tency
Test category: Class-C per Ed. 4.0 (2014) (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 15:32:39 — End time: 15:35:30
Test duration (min): 2.5 — Data file name: H-000307.cts_data
Comment: BCW098 LED40/NW PSD L 1200 — S/N:E1509987-01/01
Customer: TUV SUD

Test Result: Pass — Source qualification: Normal
THC(A): 0.029 — I-THD(%): 16.6 — POHC(A): 0.000 — POHC Limit(A): 0.016
Highest parameter values during test:

V_RMS (Volts):	229.96	Frequency(Hz):	50.00
I_Peak (Amps):	0.292	I_RMS (Amps):	0.176
I_Fund (Amps):	0.174	Crest Factor:	1.661
Power (Watts):	38.8	Power Factor:	0.960

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.003	N/A	0.001	0.005	N/A	Pass
3	0.025	0.050	50.6	0.026	0.075	35.2	Pass
4	0.001	0.000	N/A	0.001	0.000	N/A	Pass
5	0.011	0.017	65.6	0.012	0.026	44.5	Pass
6	0.000	0.000	N/A	0.000	0.000	N/A	Pass
7	0.006	0.012	51.0	0.007	0.018	35.9	Pass
8	0.000	0.000	N/A	0.000	0.000	N/A	Pass
9	0.003	0.009	N/A	0.003	0.013	N/A	Pass
10	0.000	0.000	N/A	0.000	0.000	N/A	Pass
11	0.001	0.005	N/A	0.001	0.008	N/A	Pass
12	0.000	0.000	N/A	0.000	0.000	N/A	Pass
13	0.000	0.005	N/A	0.000	0.008	N/A	Pass
14	0.000	0.000	N/A	0.000	0.000	N/A	Pass
15	0.001	0.005	N/A	0.001	0.008	N/A	Pass
16	0.000	0.000	N/A	0.000	0.000	N/A	Pass
17	0.001	0.005	N/A	0.001	0.008	N/A	Pass
18	0.000	0.000	N/A	0.000	0.000	N/A	Pass
19	0.001	0.005	N/A	0.001	0.008	N/A	Pass
20	0.000	0.000	N/A	0.000	0.000	N/A	Pass
21	0.001	0.005	N/A	0.001	0.008	N/A	Pass
22	0.000	0.000	N/A	0.000	0.000	N/A	Pass
23	0.000	0.005	N/A	0.000	0.008	N/A	Pass
24	0.000	0.000	N/A	0.000	0.000	N/A	Pass
25	0.000	0.005	N/A	0.000	0.008	N/A	Pass
26	0.000	0.000	N/A	0.000	0.000	N/A	Pass
27	0.000	0.005	N/A	0.001	0.008	N/A	Pass
28	0.001	0.000	N/A	0.001	0.000	N/A	Pass
29	0.001	0.005	N/A	0.001	0.008	N/A	Pass
30	0.000	0.000	N/A	0.000	0.000	N/A	Pass
31	0.000	0.005	N/A	0.001	0.008	N/A	Pass
32	0.001	0.000	N/A	0.001	0.000	N/A	Pass
33	0.000	0.005	N/A	0.000	0.008	N/A	Pass
34	0.000	0.000	N/A	0.000	0.000	N/A	Pass
35	0.000	0.005	N/A	0.000	0.008	N/A	Pass
36	0.000	0.000	N/A	0.000	0.000	N/A	Pass
37	0.000	0.005	N/A	0.000	0.008	N/A	Pass
38	0.000	0.000	N/A	0.000	0.000	N/A	Pass
39	0.000	0.005	N/A	0.000	0.008	N/A	Pass
40	0.000	0.000	N/A	0.000	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

Voltage Fluctuations and Flicker

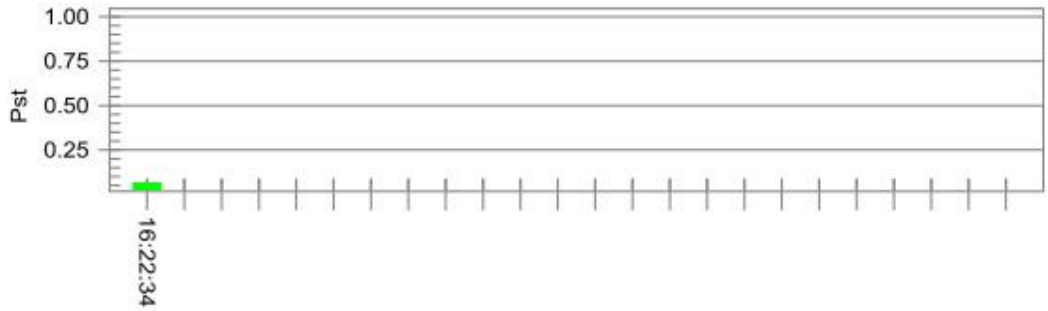
BCW098 LED40/CW PSU L1200

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

EUT: LED Waterproof — Tested by: Tency
Test category: dt,dmax,dc and Pst (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 16:12:03 — End time: 16:22:35
Test duration (min): 10 — Data file name: F-000311.cts_data
Comment: BCW098 LED40/NW PSD L 1200 — S/N: E1509987-01/01
Customer: TUV SUD

Test Result: Pass — Status: Test Completed

Pst_i and limit line — European Limits

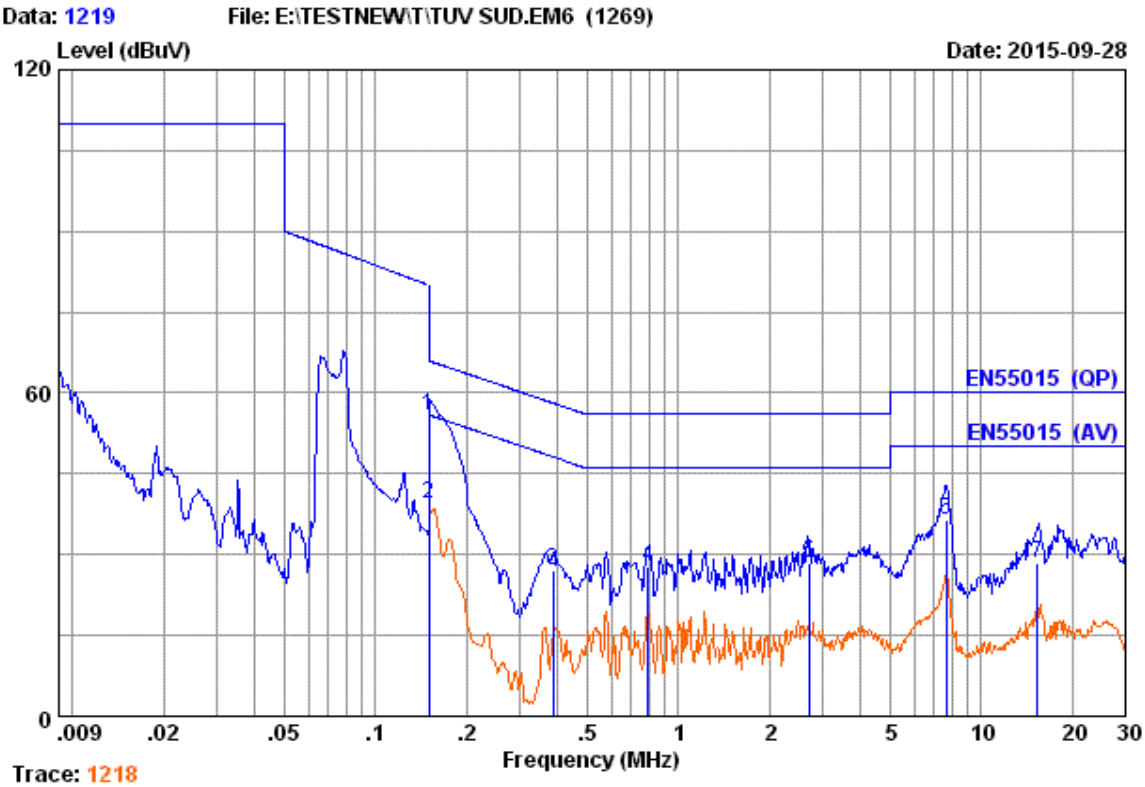


Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.82			
Highest dt (%):	0.00	Test limit (%):	N/A	N/A
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.14	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass

Conducted Emissions

BCW098 LED40/NW PSD L1200



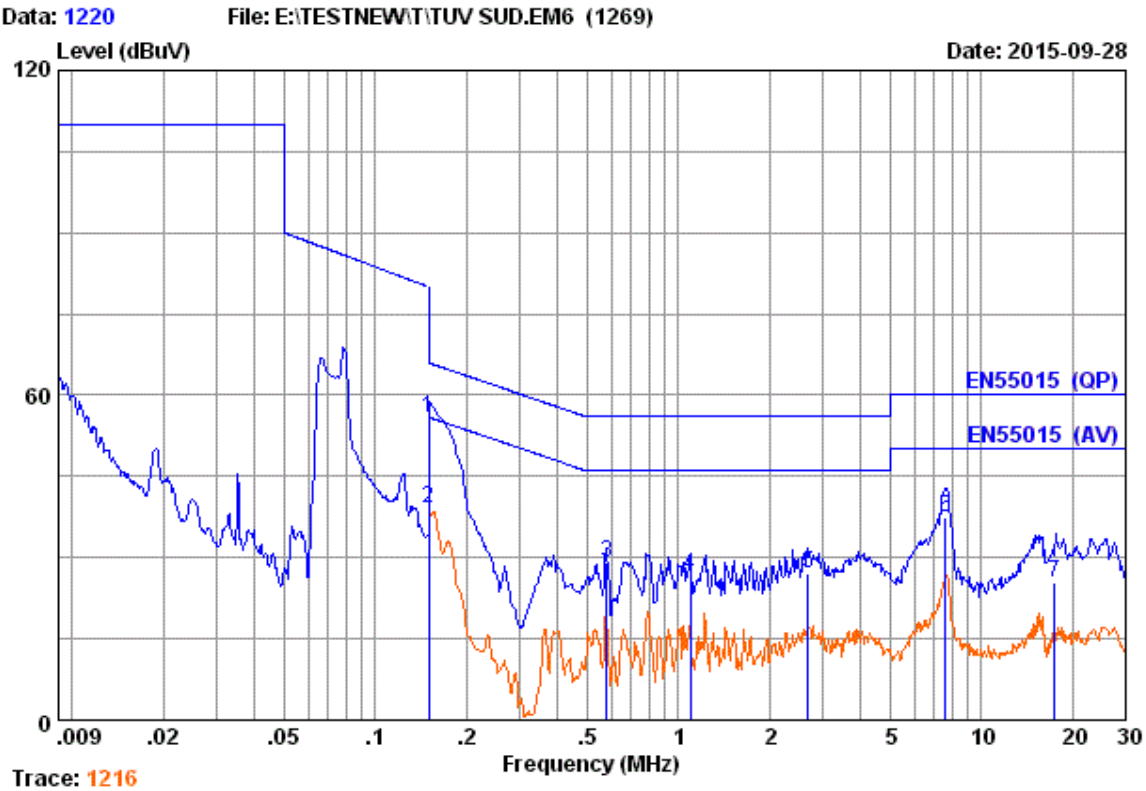
Site no : Audix(Shanghai) Shielded1 Data no :1219
AMN : ESH2-Z5-2015 AMN Phase :LINE
Limit : EN55015 (QP)
Env/Ins : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Maximum(Lighting)

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.11	0.05	55.80	55.96	66.00	10.04	QP
2	0.150	0.11	0.05	39.30	39.46	56.00	16.54	Average
3	0.386	0.12	0.07	26.81	27.00	58.15	31.15	QP
4	0.798	0.14	0.09	27.49	27.72	56.00	28.28	QP
5	2.699	0.18	0.13	28.21	28.52	56.00	27.48	QP
6	7.673	0.23	0.19	35.91	36.33	60.00	23.67	QP
7	15.370	0.32	0.26	28.00	28.58	60.00	31.42	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Conducted Emissions

BCW098 LED40/NW PSD L1200



Trace: 1216

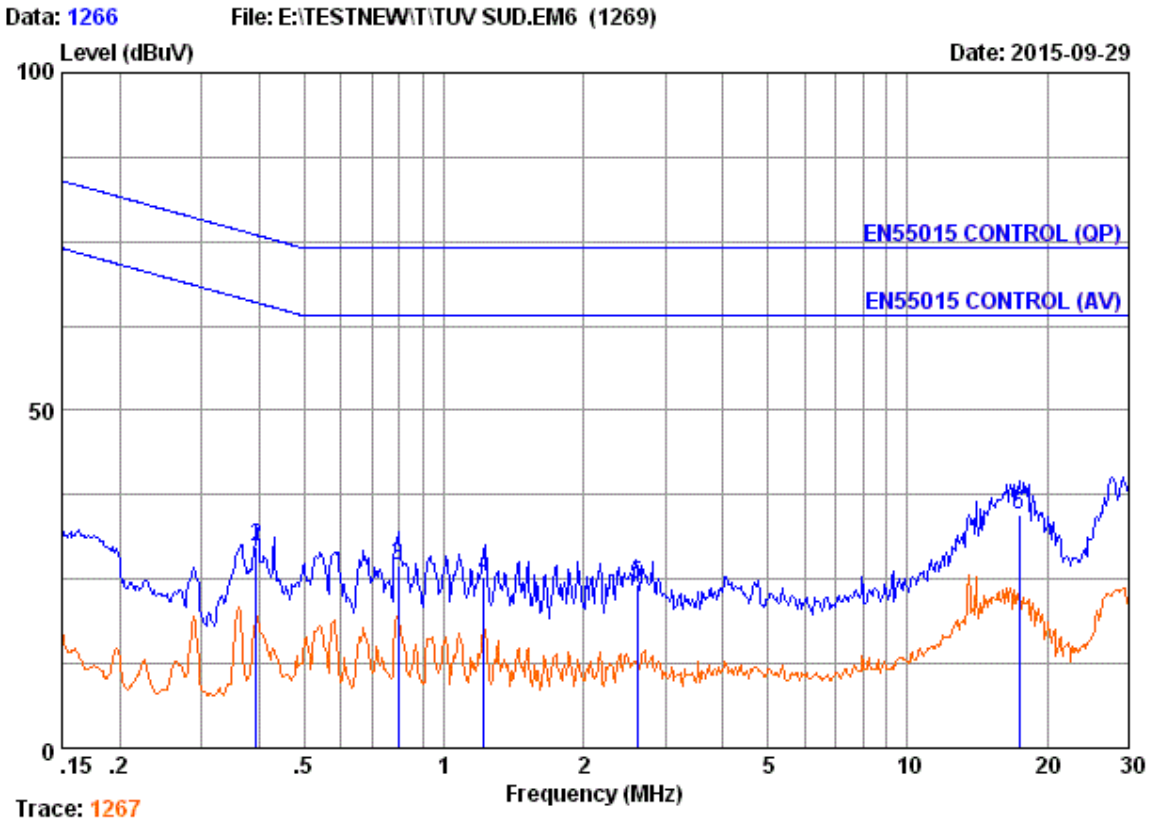
Site no : Audix(Shanghai) Shielded1 Data no :1220
AMN : ESH2-Z5-2015 AMN Phase :NEUTRAL
Limit : EN55015 (QP)
Env/Ins : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Maximum(Lighting)

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.11	0.05	55.60	55.76	66.00	10.24	QP
2	0.150	0.11	0.05	39.10	39.26	56.00	16.74	Average
3	0.579	0.13	0.08	28.81	29.02	56.00	26.98	QP
4	1.094	0.15	0.10	26.50	26.75	56.00	29.25	QP
5	2.684	0.20	0.13	26.80	27.13	56.00	28.87	QP
6	7.644	0.32	0.19	36.90	37.41	60.00	22.59	QP
7	17.480	0.62	0.28	24.49	25.39	60.00	34.61	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Conducted Emissions

BCW098 LED40/NW PSD L1200



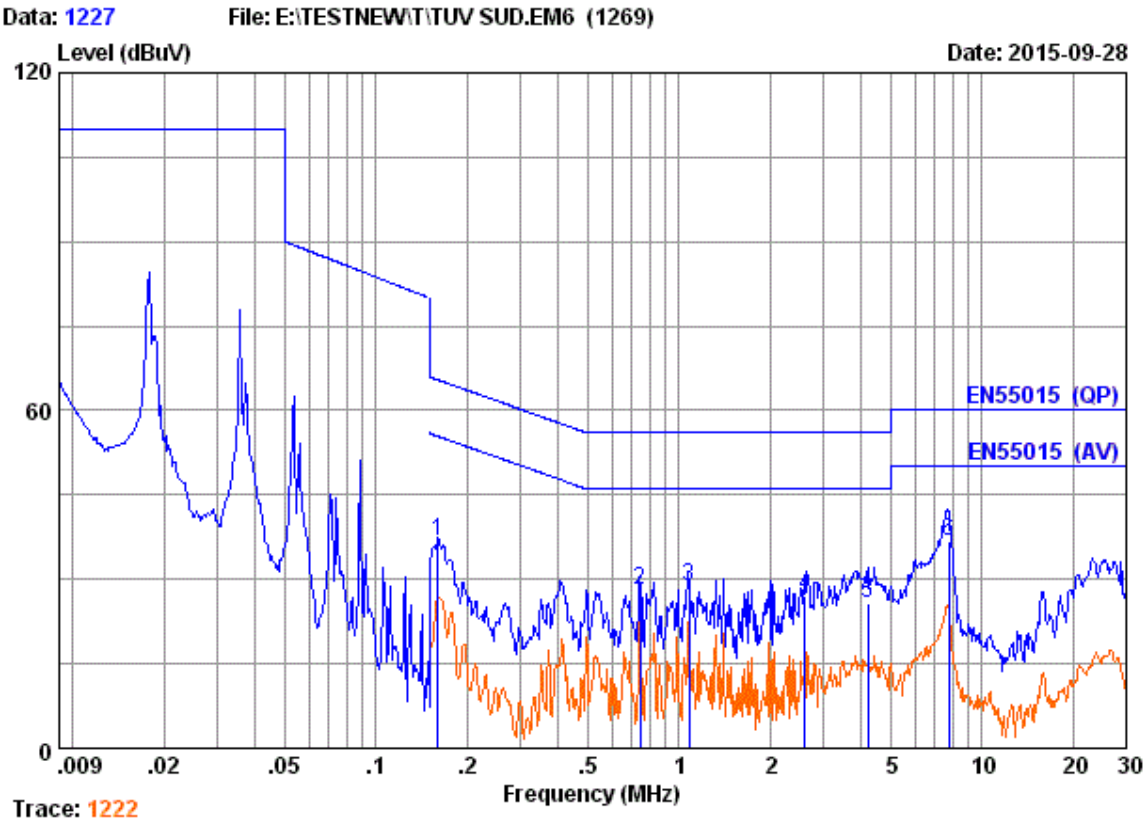
Site no : Audix(Shanghai) Shielded1 Data no. :1266
ISN. : ENY22-353/005-2015 Test Line :Control line
Limit : EN55015 CONTROL (QP)
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Maximum(Lighting)

	Freq (MHz)	ISN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	10.48	0.05	16.60	27.13	84.00	56.87	QP
2	0.393	10.40	0.08	19.29	29.77	75.99	46.22	QP
3	0.796	10.33	0.09	16.50	26.92	74.00	47.08	QP
4	1.218	10.29	0.10	15.01	25.40	74.00	48.60	QP
5	2.613	10.26	0.13	13.80	24.19	74.00	49.81	QP
6	17.383	10.37	0.28	23.89	34.54	74.00	39.46	QP

Remarks:1.Emission Level= ISN Factor + Cable Loss + Reading
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Conducted Emissions

BCW098 LED40/NW PSD L1200



Trace: 1222

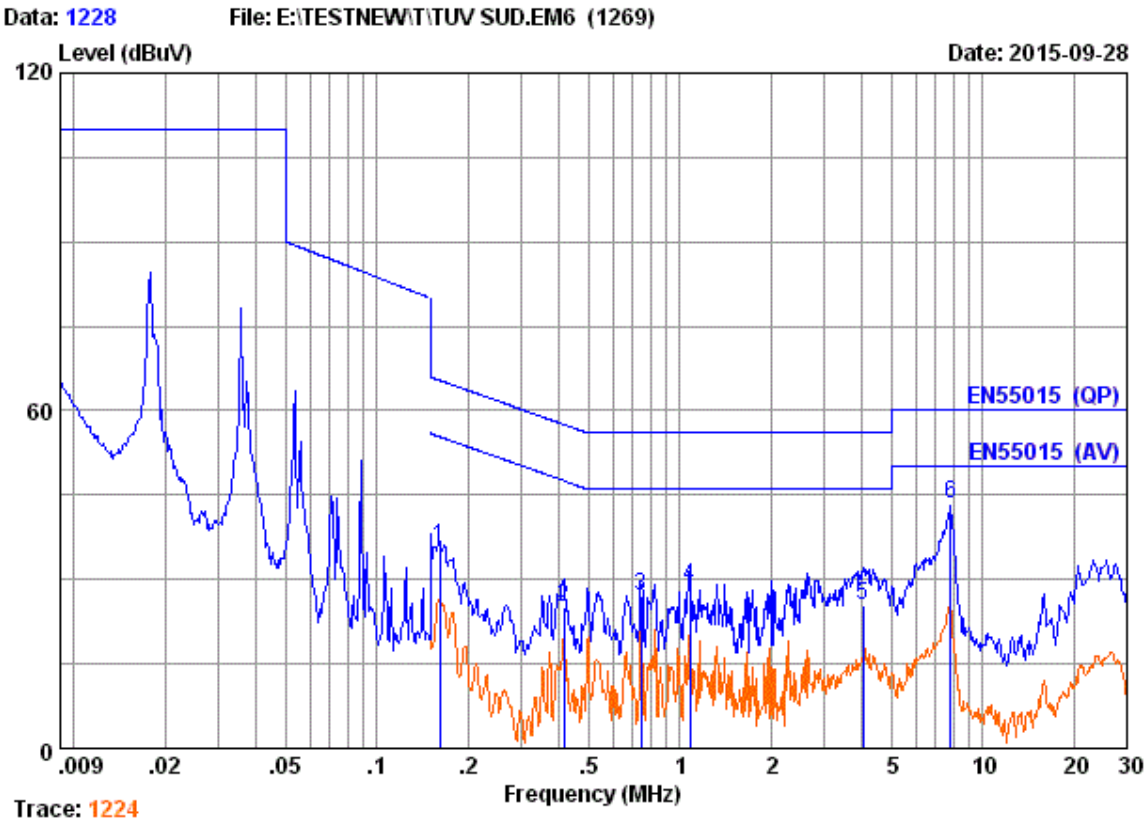
Site no	: Audix(Shanghai) Shielded1	Data no	:1227
AMN	: ESH2-Z5-2015	AMN Phase	:LINE
Limit	: EN55015 (QP)		
Env/Ins	: 22'C 48%RH / ESCI	Engineer	:Eric
EUT	: LED Waterproof		
M/N	: BCW098 LED40/NW PSD L 1200		
S/N	: E1509987-01/01		
Power Rating	: 230V/50Hz		
Test Mode	: Minimum(Lighting)		

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.161	0.11	0.05	36.50	36.66	65.43	28.77	QP
2	0.748	0.13	0.09	27.80	28.02	56.00	27.98	QP
3	1.082	0.15	0.10	28.50	28.75	56.00	27.25	QP
4	2.601	0.18	0.13	26.90	27.21	56.00	28.79	QP
5	4.220	0.20	0.15	25.50	25.85	56.00	30.15	QP
6	7.766	0.23	0.20	36.50	36.93	60.00	23.07	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Conducted Emissions

BCW098 LED40/NW PSD L1200



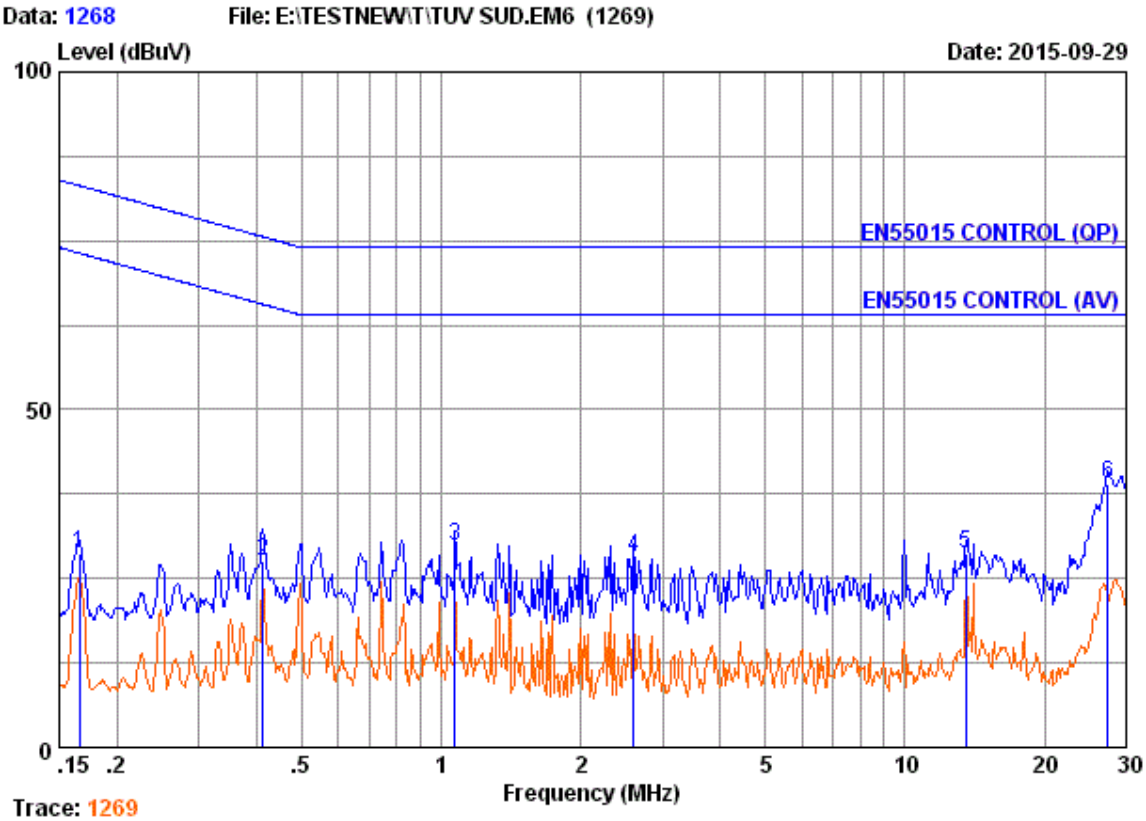
Site no : Audix(Shanghai) Shielded1 Data no :1228
AMN : ESH2-Z5-2015 AMN Phase :NEUTRAL
Limit : EN55015 (QP)
Env/Ins : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Minimum(Lighting)

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.161	0.11	0.05	35.50	35.66	65.39	29.73	QP
2	0.414	0.13	0.08	24.99	25.20	57.57	32.37	QP
3	0.748	0.14	0.09	26.80	27.03	56.00	28.97	QP
4	1.084	0.15	0.10	28.60	28.85	56.00	27.15	QP
5	4.034	0.23	0.14	24.91	25.28	56.00	30.72	QP
6	7.835	0.32	0.20	43.10	43.62	60.00	16.38	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Conducted Emissions

BCW098 LED40/NW PSD L1200



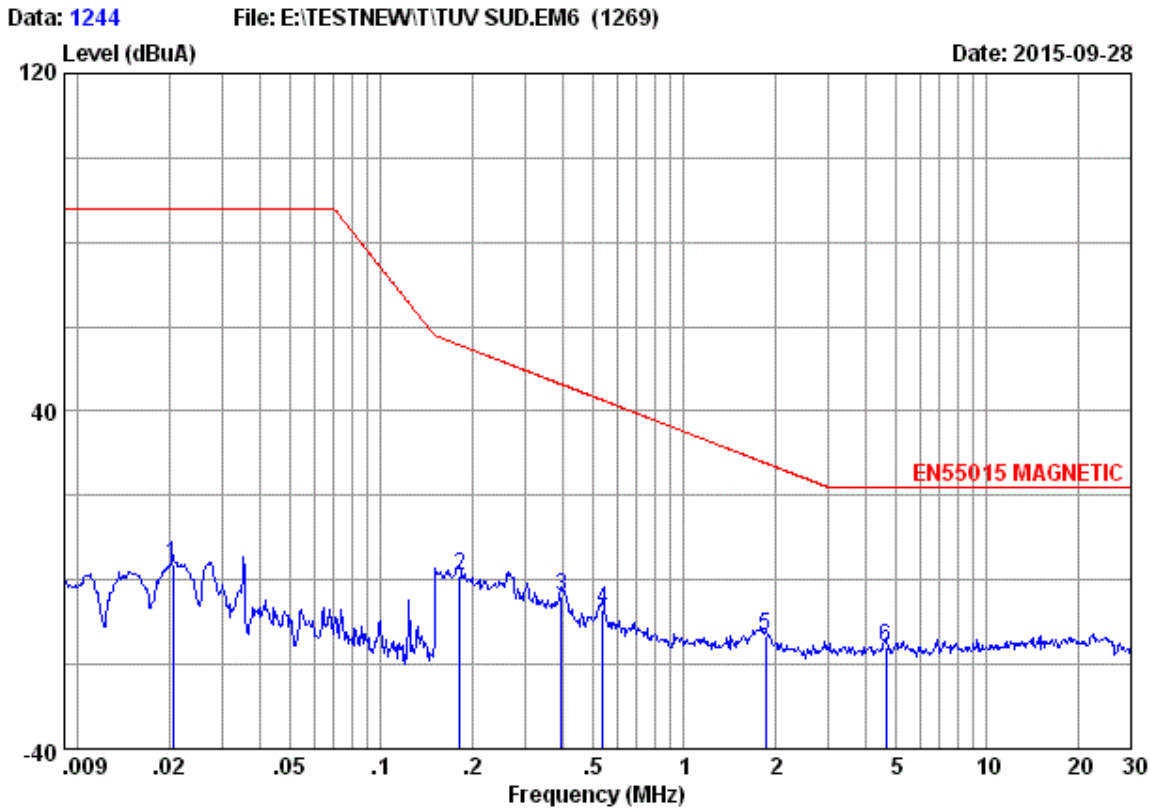
Site no : Audix(Shanghai) Shielded1 Data no. :1268
ISN. : ENY22-353/005-2015 Test Line :Control line
Limit : EN55015 CONTROL (QP)
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Minimum(Lighting)

	Freq (MHz)	ISN. Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.166	10.47	0.05	18.05	28.57	83.16	54.59	QP
2	0.413	10.39	0.08	17.20	27.67	75.59	47.92	QP
3	1.071	10.30	0.10	19.31	29.71	74.00	44.29	QP
4	2.594	10.26	0.13	17.75	28.14	74.00	45.86	QP
5	13.551	10.33	0.25	18.06	28.64	74.00	45.36	QP
6	27.416	10.47	0.36	28.24	39.07	74.00	34.93	QP

Remarks:1.Emission Level= ISN Factor + Cable Loss + Reading
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

Radiated Emissions (Magnetic Field)

BCW098 LED40/NW PSD L1200



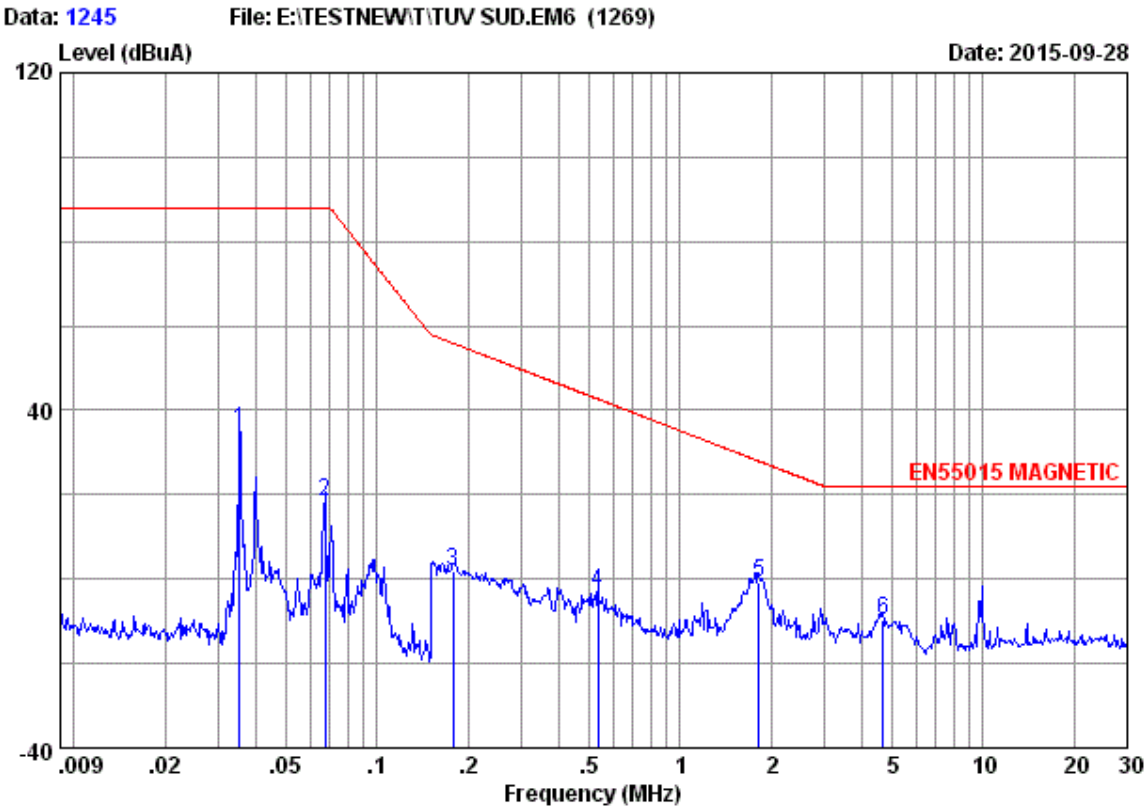
Site no : Audix(Shanghai) Shielded1 Data no. :1244
Antenna. : RF 300 2015 Antenna Phase:A
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Maximum(Lighting)

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.021	-5.93	0.05	9.72	3.84	88.00	84.16
2	0.182	-6.72	0.06	7.76	1.10	55.64	54.54
3	0.394	-13.98	0.08	10.02	-3.88	46.38	50.26
4	0.541	-17.73	0.08	10.75	-6.90	42.58	49.48
5	1.857	-21.85	0.13	8.44	-13.28	27.77	41.05
6	4.644	-22.66	0.15	6.76	-15.75	22.00	37.75

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Magnetic Field)

BCW098 LED40/NW PSD L1200



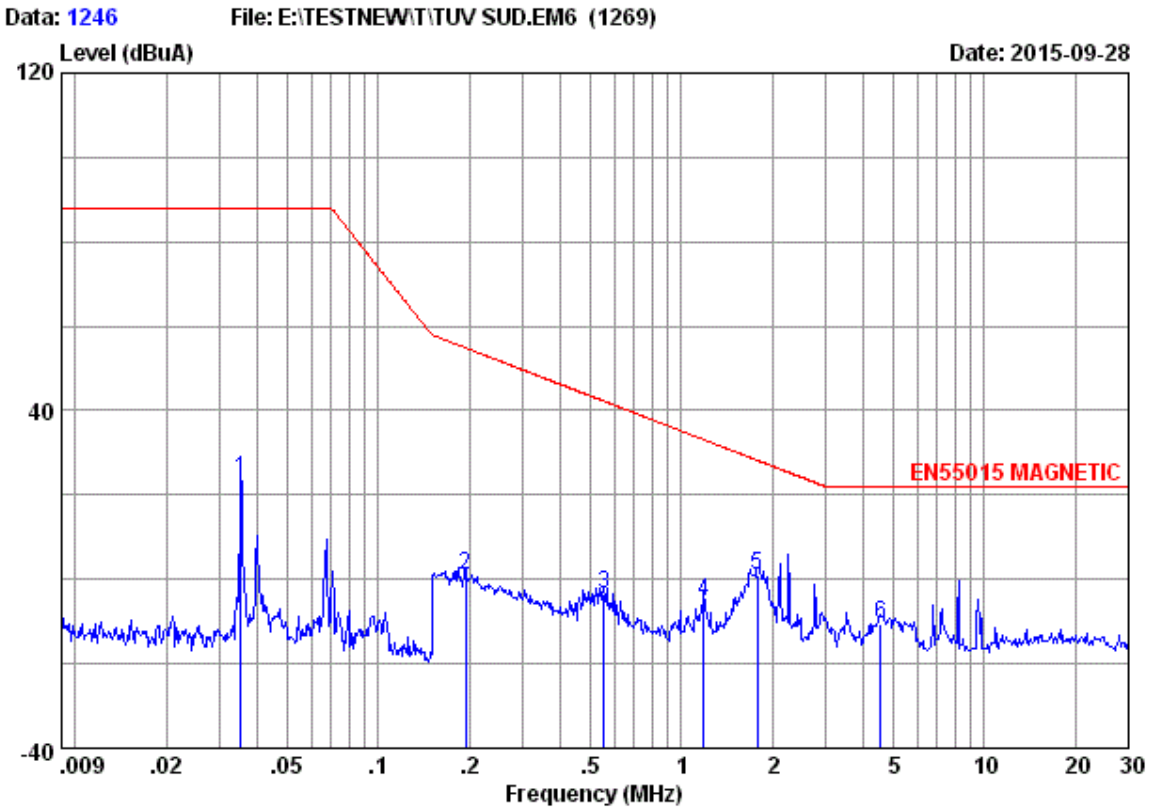
Site no : Audix(Shanghai) Shielded1 Data no. :1245
Antenna. : RF 300 2015 Antenna Phase:B
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Maximum(Lighting)

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.035	-5.26	0.05	40.33	35.12	88.00	52.88
2	0.067	-4.58	0.05	23.09	18.56	88.00	69.44
3	0.178	-6.72	0.06	8.55	1.89	55.94	54.05
4	0.537	-17.73	0.08	14.42	-3.23	42.68	45.91
5	1.827	-21.82	0.13	21.12	-0.57	27.96	28.53
6	4.681	-22.66	0.15	12.77	-9.74	22.00	31.74

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Magnetic Field)

BCW098 LED40/NW PSD L1200



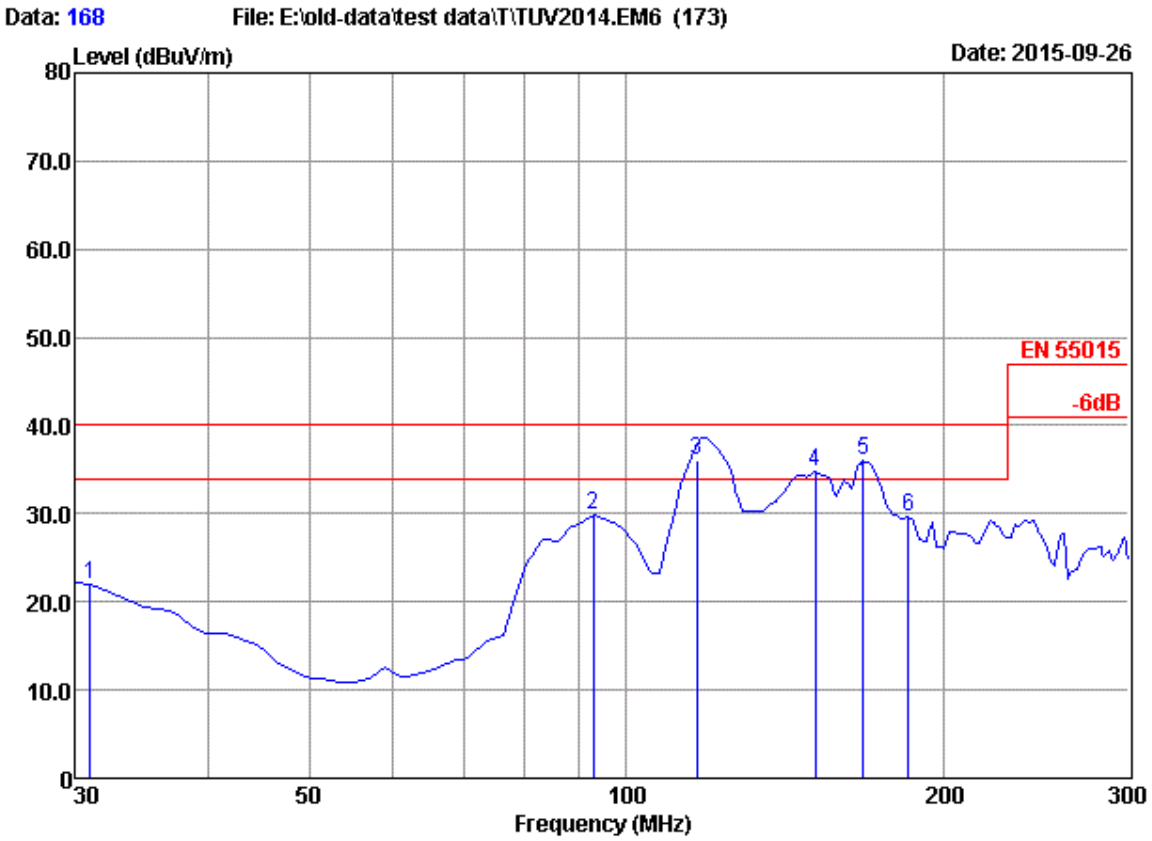
Site no : Audix(Shanghai) Shielded1 Data no. :1246
Antenna. : RF 300 2015 Antenna Phase:C
Limit : EN55015 MAGNETIC
Env. / Ins. : 22'C 48%RH / ESCI Engineer :Eric
EUT : LED Waterproof
M/N : BCW098 LED40/NW PSD L 1200
S/N : E1509987-01/01
Power Rating : 230V/50Hz
Test Mode : Maximum(Lighting)

	Freq (MHz)	Antenna. Factor (dB)	Cable Loss (dB)	Reading (dBµA)	Emission Level (dBµA)	Limits (dBµA)	Margin (dB)
1	0.035	-5.26	0.05	28.76	23.55	88.00	64.45
2	0.195	-6.72	0.06	7.46	0.80	54.86	54.06
3	0.554	-17.73	0.08	14.09	-3.56	42.29	45.85
4	1.189	-21.18	0.10	16.02	-5.06	33.13	38.19
5	1.783	-21.76	0.13	22.47	0.84	28.25	27.41
6	4.569	-22.65	0.15	12.08	-10.42	22.00	32.42

Remarks: Emission Level= Antenna Factor + Cable Loss + Reading

Radiated Emissions (Electric Field)

BCW098 LED40/NW PSD L1200



Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015
Limit :EN 55015
Env. / Ins. :22'C 60%RH/ESCI
EUT :LED Waterproof
M/N :BCW098 LED40/NW PSD L 1200
S/N :E1509987-01/01
Power Rating:230V/50Hz
Test Mode :Maximum(Lighting)

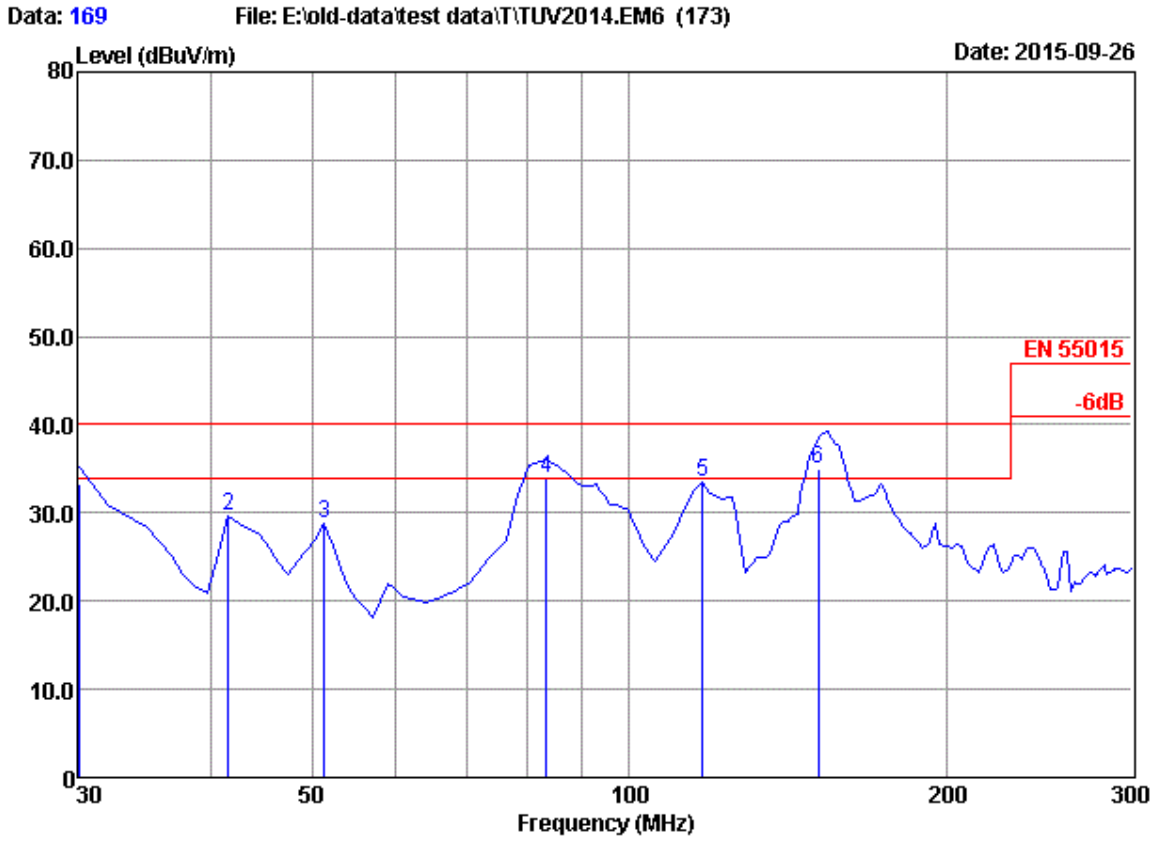
Data no. :168
Ant. pol. :HORIZONTAL
Engineer :Henry

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.97	18.15	0.64	3.29	22.08	40.00	17.92
2	93.05	11.30	1.24	17.24	29.78	40.00	10.22
3	116.64	12.73	1.44	21.80	35.97	40.00	4.03
4	151.25	11.43	1.65	21.62	34.70	40.00	5.30
5	167.74	11.07	1.77	23.21	36.05	40.00	3.95
6	185.20	10.50	1.88	17.33	29.71	40.00	10.29

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Radiated Emissions (Electric Field)

BCW098 LED40/NW PSD L1200



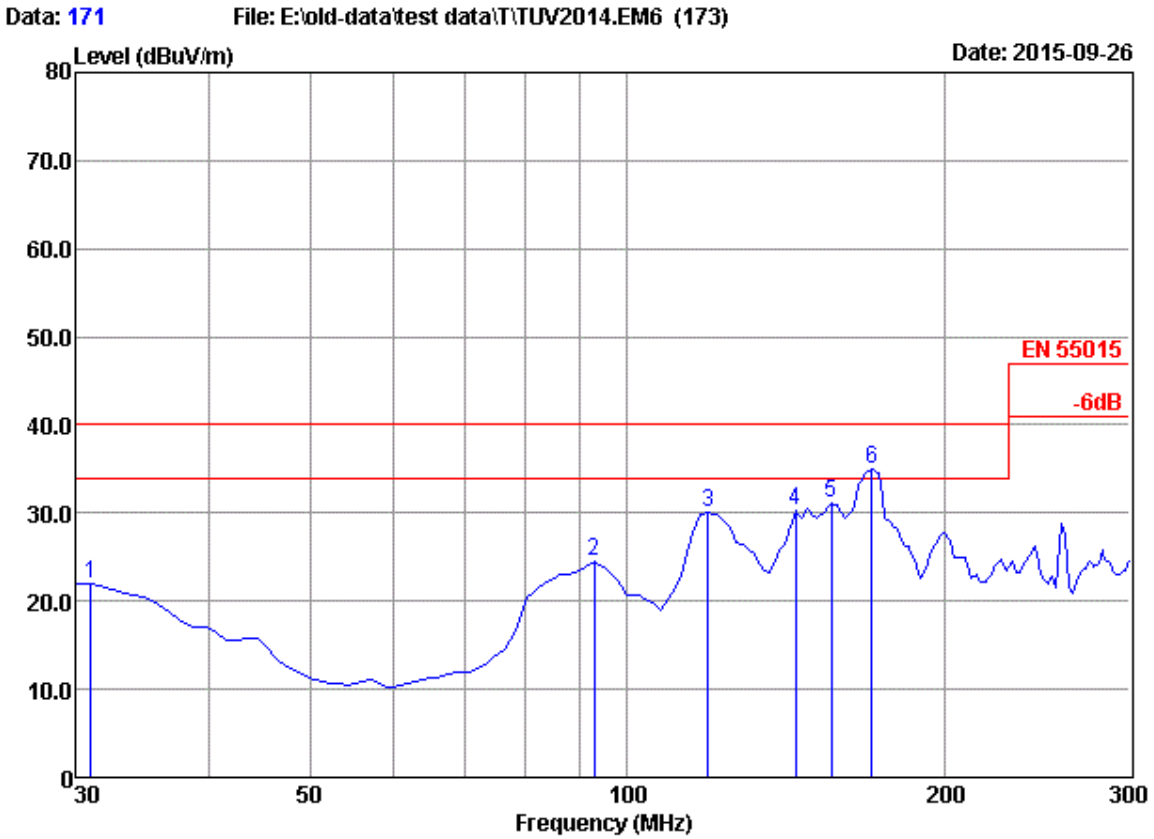
Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015 Data no. :169
Limit :EN 55015 Ant. pol. :VERTICAL
Env. / Ins. :22'C 60%RH/ESCI Engineer :Henry
EUT :LED Waterproof
M/N :BCW098 LED40/NW PSD L 1200
S/N :E1509987-01/01
Power Rating:230V/50Hz
Test Mode :Maximum(Lighting)

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.00	18.90	0.63	13.65	33.18	40.00	6.82
2	41.64	12.41	0.75	16.49	29.65	40.00	10.35
3	51.34	7.27	0.82	20.74	28.83	40.00	11.17
4	83.35	9.66	1.13	23.22	34.01	40.00	5.99
5	117.30	12.75	1.44	19.23	33.42	40.00	6.58
6	151.12	11.43	1.65	21.89	34.97	40.00	5.03

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Radiated Emissions (Electric Field)

BCW098 LED40/NW PSD L1200



Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015
Limit :EN 55015
Env. / Ins. :22'C 60%RH/ESCI
EUT :LED Waterproof
M/N :BCW098 LED40/NW PSD L 1200
S/N :E1509987-01/01
Power Rating:230V/50Hz
Test Mode :Minimum(Lighting)

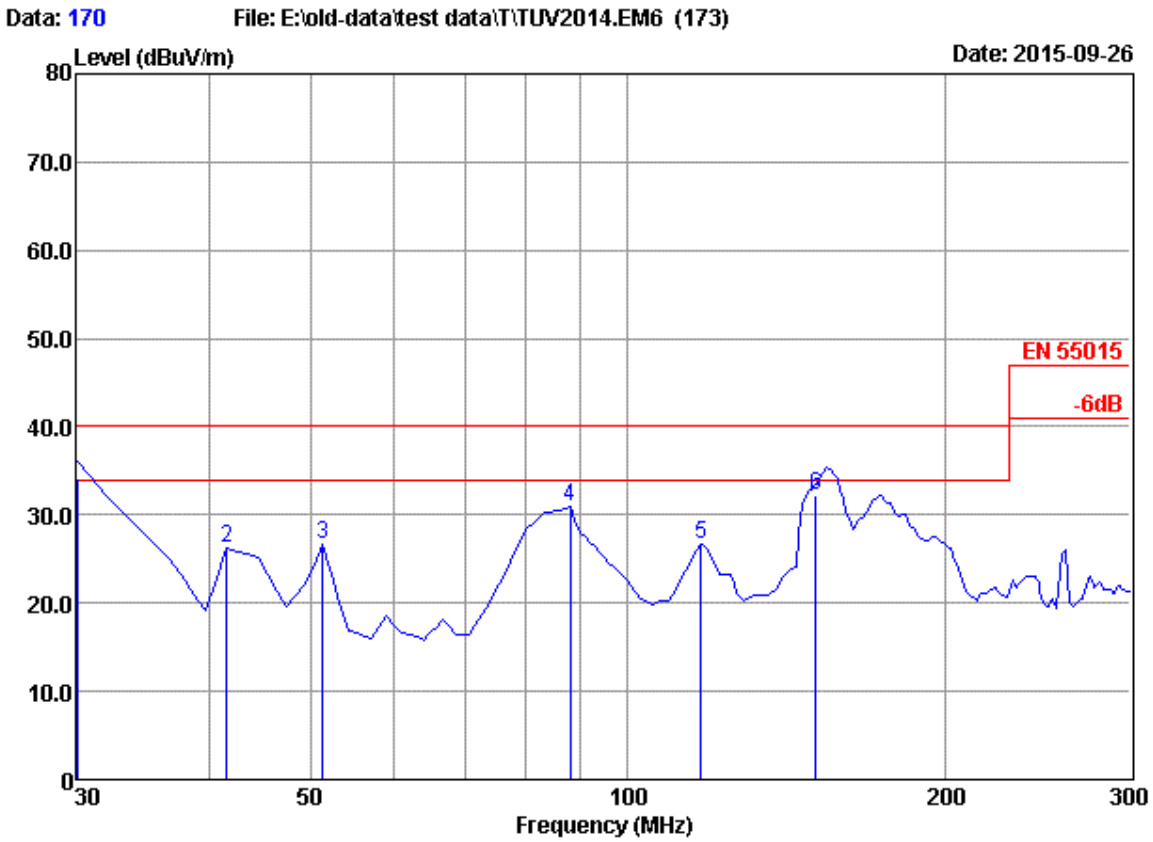
Data no. :171
Ant. pol. :HORIZONTAL
Engineer :Henry

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.97	18.15	0.64	3.26	22.05	40.00	17.95
2	93.05	11.30	1.24	11.98	24.52	40.00	15.48
3	119.24	12.79	1.45	15.76	30.00	40.00	10.00
4	144.46	12.15	1.60	16.48	30.23	40.00	9.77
5	156.10	11.18	1.68	18.31	31.17	40.00	8.83
6	170.65	10.87	1.78	22.34	34.99	40.00	5.01

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Radiated Emissions (Electric Field)

BCW098 LED40/NW PSD L1200



Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL6112D-2015 Data no. :170
Limit :EN 55015 Ant. pol. :VERTICAL
Env. / Ins. :22'C 60%RH/ESCI Engineer :Henry
EUT :LED Waterproof
M/N :BCW098 LED40/NW PSD L 1200
S/N :E1509987-01/01
Power Rating:230V/50Hz
Test Mode :Minimum(Lighting)

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
1	30.00	18.90	0.63	14.51	34.04	40.00	5.96
2	41.64	12.41	0.75	13.11	26.27	40.00	13.73
3	51.34	7.27	0.82	18.59	26.68	40.00	13.32
4	88.20	10.25	1.18	19.50	30.93	40.00	9.07
5	117.30	12.75	1.44	12.53	26.72	40.00	13.28
6	150.88	11.43	1.63	19.20	32.26	40.00	7.74

Remarks:1.Emission Level= Antenna Factor + Cable Loss+ Reading.
2.The emission levels that are 20dB below the offical limits are not reported.

Harmonic Current Emissions

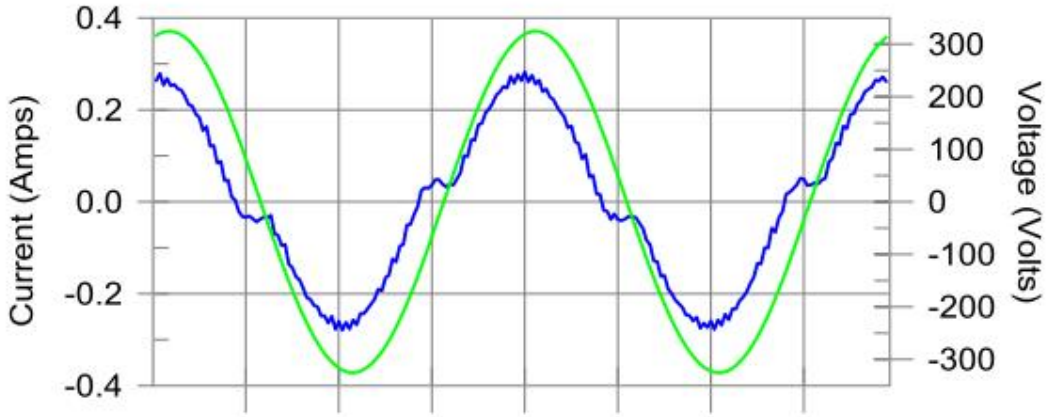
BCW098 LED40/NW PSD L1200

Harmonics – Class-C per Ed. 4.0 (2014)(Run time)

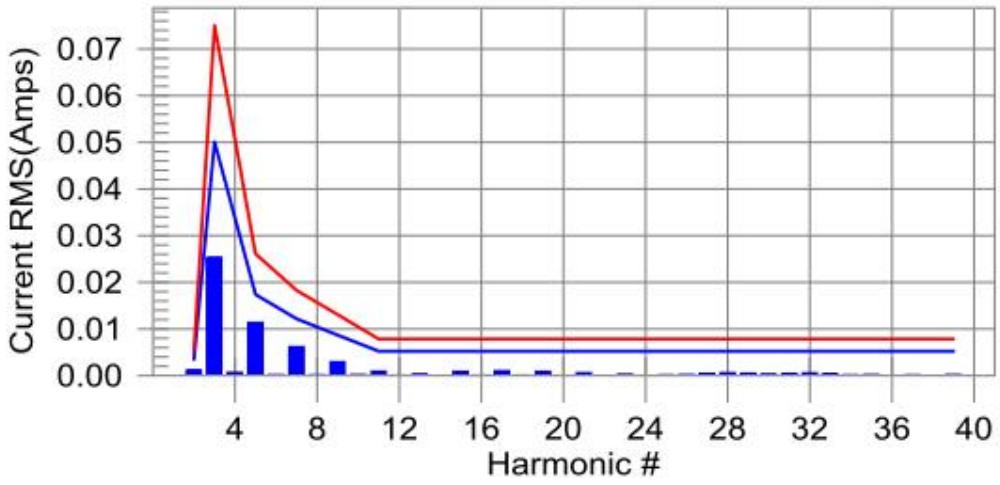
EUT: LED Waterproof **Tested by: Tency**
Test category: Class-C per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2015-9-30 **Start time: 15:32:39** **End time: 15:35:30**
Test duration (min): 2.5 **Data file name: H-000307.cts_data**
Comment: BCW098 LED40/NW PSD L 1200 **S/N: E1509987-01/01**
Customer: TUV SUD

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class C limit line **European Limits**



Test result: Pass **Worst harmonics H5-65.6% of 100% limit, H5-44.5% of 150% limit.**

Harmonic Current Emissions

BCW098 LED40/NW PSD L1200

Current Test Result Summary (Run time)

EUT: LED Waterproof — Tested by: Tency
Test category: Class-C per Ed. 4.0 (2014) (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 15:32:39 — End time: 15:35:30
Test duration (min): 2.5 — Data file name: H-000307.cts_data
Comment: BCW098 LED40/NW PSD L 1200 — S/N:E1509987-01/01
Customer: TUV SUD

Test Result: Pass — Source qualification: Normal
THC(A): 0.029 — I-THD(%): 16.6 — POHC(A): 0.000 — POHC Limit(A): 0.016
Highest parameter values during test:

V_RMS (Volts):	229.96	Frequency(Hz):	50.00
I_Peak (Amps):	0.292	I_RMS (Amps):	0.176
I_Fund (Amps):	0.174	Crest Factor:	1.661
Power (Watts):	38.8	Power Factor:	0.960

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.003	N/A	0.001	0.005	N/A	Pass
3	0.025	0.050	50.6	0.026	0.075	35.2	Pass
4	0.001	0.000	N/A	0.001	0.000	N/A	Pass
5	0.011	0.017	65.6	0.012	0.026	44.5	Pass
6	0.000	0.000	N/A	0.000	0.000	N/A	Pass
7	0.006	0.012	51.0	0.007	0.018	35.9	Pass
8	0.000	0.000	N/A	0.000	0.000	N/A	Pass
9	0.003	0.009	N/A	0.003	0.013	N/A	Pass
10	0.000	0.000	N/A	0.000	0.000	N/A	Pass
11	0.001	0.005	N/A	0.001	0.008	N/A	Pass
12	0.000	0.000	N/A	0.000	0.000	N/A	Pass
13	0.000	0.005	N/A	0.000	0.008	N/A	Pass
14	0.000	0.000	N/A	0.000	0.000	N/A	Pass
15	0.001	0.005	N/A	0.001	0.008	N/A	Pass
16	0.000	0.000	N/A	0.000	0.000	N/A	Pass
17	0.001	0.005	N/A	0.001	0.008	N/A	Pass
18	0.000	0.000	N/A	0.000	0.000	N/A	Pass
19	0.001	0.005	N/A	0.001	0.008	N/A	Pass
20	0.000	0.000	N/A	0.000	0.000	N/A	Pass
21	0.001	0.005	N/A	0.001	0.008	N/A	Pass
22	0.000	0.000	N/A	0.000	0.000	N/A	Pass
23	0.000	0.005	N/A	0.000	0.008	N/A	Pass
24	0.000	0.000	N/A	0.000	0.000	N/A	Pass
25	0.000	0.005	N/A	0.000	0.008	N/A	Pass
26	0.000	0.000	N/A	0.000	0.000	N/A	Pass
27	0.000	0.005	N/A	0.001	0.008	N/A	Pass
28	0.001	0.000	N/A	0.001	0.000	N/A	Pass
29	0.001	0.005	N/A	0.001	0.008	N/A	Pass
30	0.000	0.000	N/A	0.000	0.000	N/A	Pass
31	0.000	0.005	N/A	0.001	0.008	N/A	Pass
32	0.001	0.000	N/A	0.001	0.000	N/A	Pass
33	0.000	0.005	N/A	0.000	0.008	N/A	Pass
34	0.000	0.000	N/A	0.000	0.000	N/A	Pass
35	0.000	0.005	N/A	0.000	0.008	N/A	Pass
36	0.000	0.000	N/A	0.000	0.000	N/A	Pass
37	0.000	0.005	N/A	0.000	0.008	N/A	Pass
38	0.000	0.000	N/A	0.000	0.000	N/A	Pass
39	0.000	0.005	N/A	0.000	0.008	N/A	Pass
40	0.000	0.000	N/A	0.000	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

Voltage Fluctuations and Flicker

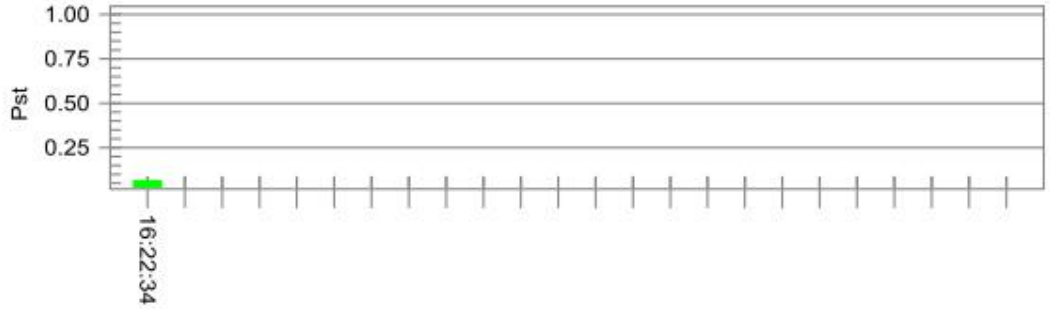
BCW098 LED40/NW PSD L1200

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

EUT: LED Waterproof — Tested by: Tency
Test category: dt,dmax,dc and Pst (European limits) — Test Margin: 100
Test date: 2015-9-30 — Start time: 16:12:03 — End time: 16:22:35
Test duration (min): 10 — Data file name: F-000311.cts_data
Comment: BCW098 LED40/NW PSD L 1200 — S/N: E1509987-01/01
Customer: TUV SUD

Test Result: Pass — Status: Test Completed

Pst_i and limit line — European Limits



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.82			
Highest dt (%):	0.00	Test limit (%):	N/A	N/A
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.14	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass

Appendix B

Data form for electrical equipment and machinery

Applicant	:	Philips Lighting Luminaires (Shanghai) Co.,Ltd.			
Address	:	2F, Building 6, No.1805, Huyi Highway, Malu Town, Jiading District, Shanghai, P.R. China.			
Factory	:	NingBo Violet Lighting Electric Co.,Ltd			
Address	:	No.885 Jinhai Rd,Cidong Industrial Park,Cixi 315331 Zhejiang People's Republic of China			
Type	:	LED Waterproof			
Model	:	BCW098 LED20/NW PSU L600, BCW098 LED20/CW PSU L600, BCW098 LED40/NW PSU L1200, BCW098 LED40/CW PSU L1200, BCW098 LED40/NW PSD L1200, BCW098 LED40/CW PSD L1200			
Rated input power	:	BCW098 LED20/NW PSU L600, BCW098 LED20/CW PSU L600: 19W BCW098 LED40/NW PSU L1200, BCW098 LED40/CW PSU L1200, BCW098 LED40/NW PSD L1200, BCW098 LED40/CW PSD L1200: 38W			
Rated voltage/ frequency	:	220-240V~/50 or 60Hz	Protection class	:	I

Configuration of equipment:

Driver

Internal wire

Short description of the EUT (Purpose of system, area of use, Function of the system):

Fixed general purpose luminaires

Sources of Interference:

Driver

Internal frequencies:

Noise suppression components:

Capacitor

Measures for electromagnetic shielding:

Component list

Object / part No.	Manufacturer/ trademark	Type / model	Technical data
Terminal	Yuyao Yunhuan Ruixin Electronics Co., Ltd.	AS02	AC450V, 0,5…1,5mm², 3 poles, T85, 100A
Alternative	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	TB-7020B/3	AC450V, 0,75…2,5mm², 3 poles, T110, 16A
Alternative	Yuyao Yunhuan Ruixin Electronics Co., Ltd.	AS02-5	AC450V, 0,5…1,5mm², 5 poles, T85, 100A
Alternative	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	TB-7020B/5	AC450V, 0,75…2,5mm², 5 poles, T110, 16A
Internal wire (input of LED driver)	Ningbo A-Line Cable and Wire Co., Ltd.	H05V-U, H05V-K	1x0,5…1,0mm²
Alternative	Cixi Hongyu Electric Appliance Co., Ltd.	H05V-U, H05V-K	1x0,5…1,0mm²
Alternative	Cixi Hongxin Wire and Cable Factory	H05V-U, H05V-K	1x0,5…1,0mm²
Alternative	Tongxiang Xintianhong Wire and Cable Factory	H05V-U, H05V-K	1x0,5…1,0mm²
LED driver	Philips	Xitanium 36W 0.12-0.4A 115V 230V	220-240V, 50…60Hz, Uout: 55…115Vdc, 36W, Iout: 0.12…0.4A
LED driver	Philips	Xitanium 75W 0.12-0.4A 220V 230V	220-240V, 50…60Hz, Uout: 100…220Vdc, 75W, Iout: 0.12…0.4A
LED driver	Philips	Xitanium 75W 0.12-0.40A 215V TD 230V	220-240V, 50…60Hz, Uout: 100-215Vdc, 75W, Iout: 0.12…0.4A
Internal wire (output of LED driver)	MOLEX INCORPORATED	29014031	24AWG
Alternative	JAPAN SOLDERLESS TERMINAL MFG CO LTD	THB	24AWG
LED module	Lejin Electronics products(HuiZhou) CO., Ltd	Fortimo LED line	Imax: 560mA, Umax: 38V
LED module	Lejin Electronics products(HuiZhou) CO., Ltd	Fortimo LED line	Imax: 400mA, Umax: 70V
Earth wire	Ningbo A-Line Cable and Wire Co., Ltd.	H05V-K H05V-U	1x0,5…1,0mm²
Alternative	Cixi Hongyu Electric Appliance Co., Ltd.	H05V-U, H05V-K	1x0,5…1,0mm²
Alternative	Cixi Hongxin Wire and Cable Factory	H05V-U, H05V-K	1x0,5…1,0mm²
Heat shrinkable sleeve	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	RSFR-H	600V, 125ºC

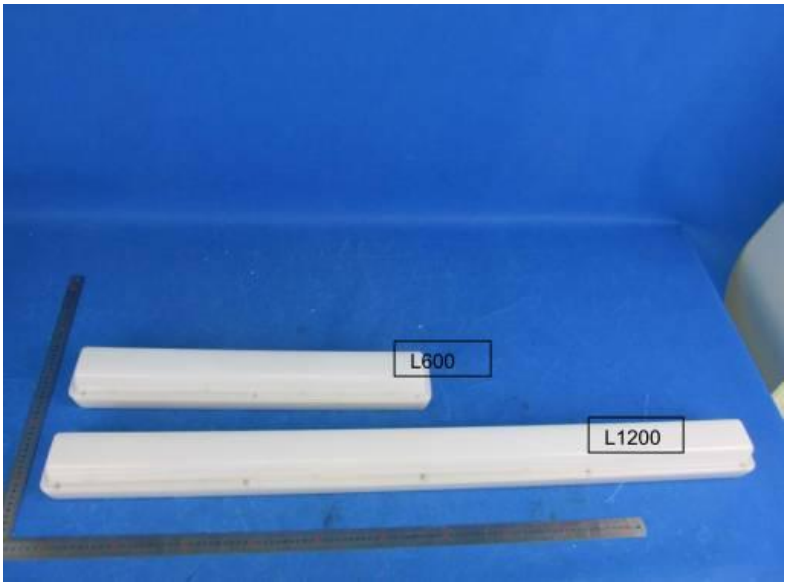
Model list

Model	Power	Lamp	LED driver	LxWxH (CM)
BCW098 LED20/NW PSU L600	19W	19W/44x0,4W LED	Xitanium 36W 0.12-0.4A 115V 230V	63,7x10x8,4
BCW098 LED20/CW PSU L600	19W	19W/44x0,4W LED	Xitanium 36W 0.12-0.4A 115V 230V	63,7x10x8,4
BCW098 LED40/NW PSU L1200	38W	38W/88x0,4W LED	Xitanium 75W 0.12-0.4A 220V 230V	118,9X10X8,4
BCW098 LED40/CW PSU L1200	38W	38W/88x0,4W LED	Xitanium 75W 0.12-0.4A 220V 230V	118,9X10X8,4
BCW098 LED40/NW PSD L1200	38W	38W/88x0,4W LED	Xitanium 75W 0.12-0.40A 215V TD 230V	118,9X10X8,4
BCW098 LED40/CW PSD L1200	38W	38W/88x0,4W LED	Xitanium 75W 0.12-0.40A 215V TD 230V	118,9X10X8,4

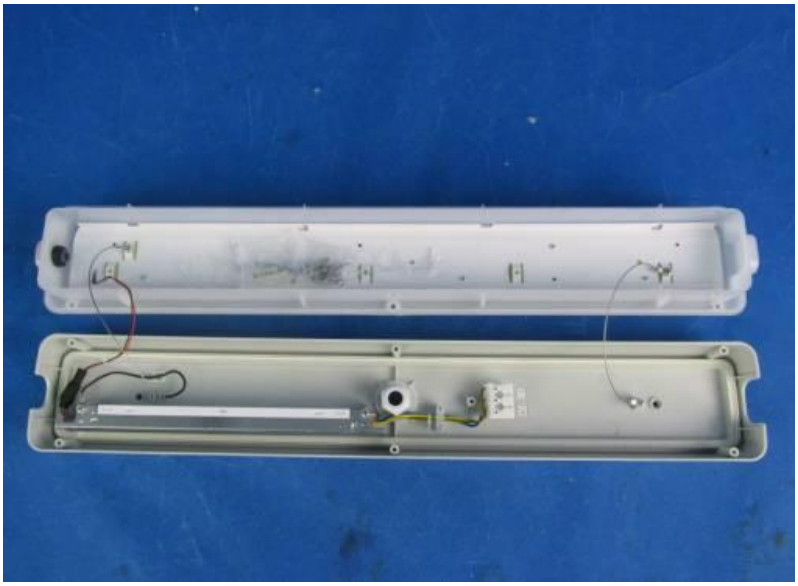
Appendix C

Constructional Photographs

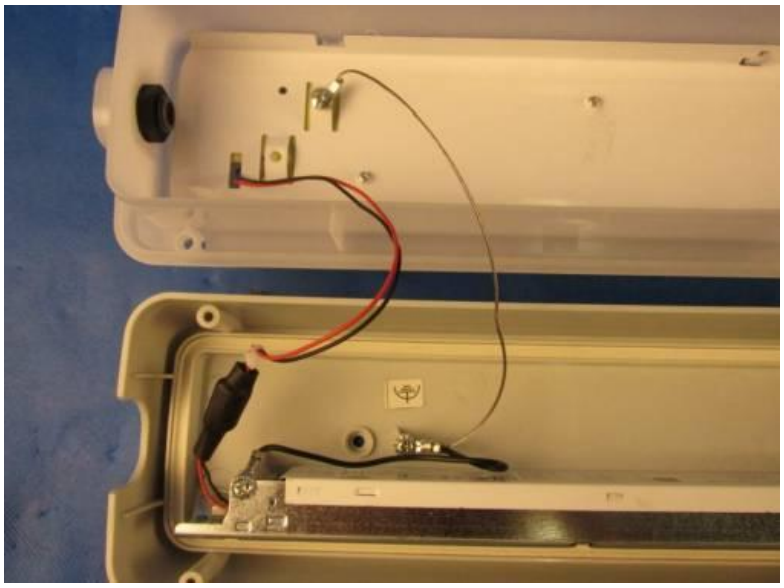
Over view

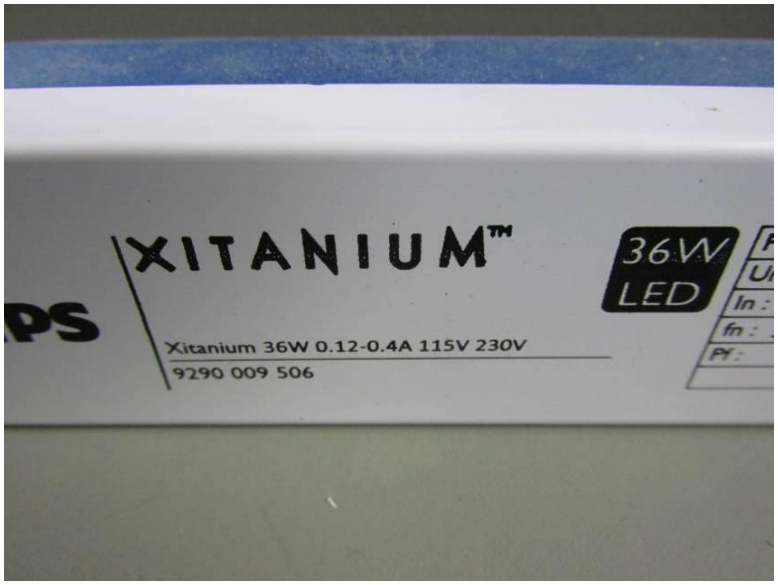


BCW098 LED20/NW PSU L600

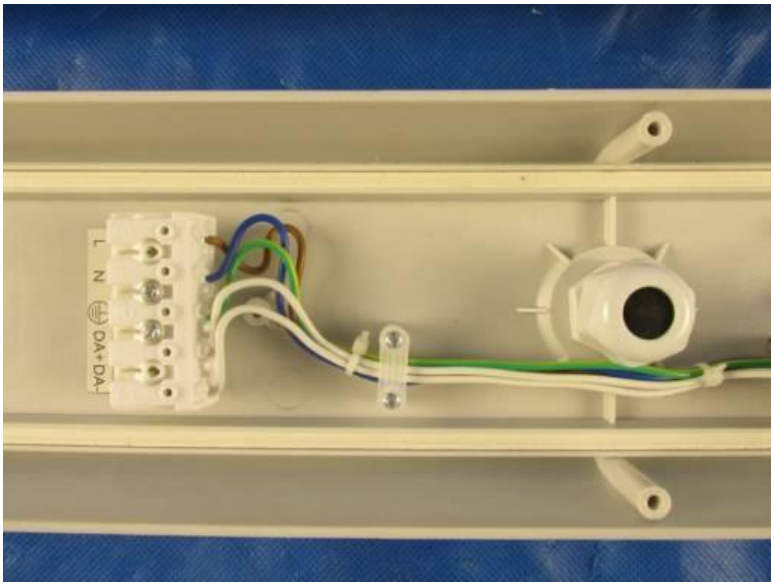



L
N




XITANIUM™
36W
LED
Xitanium 36W 0.12-0.4A 115V 230V
9290 009 506

BCW098 LED40/CW PSU L1200




IN
TP+
TP-
NI
Made in China
CLF


XITANIUM™
75W LED
Xitanium 75W 0.12-0.4A 220V 230V
9290 009 507
Pn : 80W
Un : 220...240V
In : 0.37A
fn : 50...60Hz; DC
Pf : 0.9C
Pout : 75W
Uout : 100...220Vdc
Iout : 0.12...0.4A
tc : 75°C
ta : -20...+50°C
Output not mains isolated
MADE IN POLAND
EL

BCW098 LED40/NW PSD L1200


IN
TP+
TP-
NI
Made in China
CE
CLF


XITANIUM™
LED控制装置
Xitanium 75W 0.12-0.40A 215V TD 230V
9290 008 521
75W LED
Pn : 80W
Pout : 75W
Un : 220-240V
Uout : 100-215V
In : 0.37A
Iout : 0.12-0.40A
fn : 50/60Hz; DC
tc : 75°C
Pf : 0.9C
ta : -20...+50°C
Touchdim / Dali / Corridor
Output not mains isolated
MADE IN POLAND PLE

Product Service

EMC IMMUNITY TEST REPORT

Report Number	:	708881503938-00-Part 2	Date of Issue:	November 03, 2015

Model / Serial No.	:	BCW098 LED20/NW PSU L600, BCW098 LED20/CW PSU L600, BCW098 LED40/NW PSU L1200, BCW098 LED40/CW PSU L1200, BCW098 LED40/NW PSD L1200, BCW098 LED40/CW PSD L1200
Product Type	:	LED Waterproof
Applicant	:	Philips Lighting Luminaires (Shanghai) Co., Ltd
Manufacturer	:	Philips Lighting Luminaires (Shanghai) Co., Ltd
License holder	:	Philips Lighting Luminaires (Shanghai) Co., Ltd
Address	:	2F, Building 6, No.1805, Huyi Highway, Malu Town, Jiading District, 201801 Shanghai, P.R. China.

Test Result : ■ **Positive** ☐ **Negative**

Total pages including Appendices 24

TÜV SÜD CERTIFICATION AND TESTING (CHINA) CO., LTD. SHANGHAI BRANCH reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. Jiangsu TÜV Product Service Ltd. Shanghai Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Jiangsu TÜV Product Service Ltd. Shanghai Branch issued reports.

DIRECTORY - IMMUNITY

IMMUNITY TEST REGULATIONS :

The immunity tests were performed according to the following regulations :

■ - EMC - Directive 2004/108/EC

☐ - EN 61000-6-1:2007
☐ - EN 61000-6-2:2005
☐ - EN 55014-2:1997+A1:2001+A2:2008
☐ - EN 55020:2007
☐ - EN 55024:2010
■ - EN 61547:2009

■ - IEC 61000-4-2:2008
■ - IEC 61000-4-3:2006+A1:2007
■ - IEC 61000-4-4:2004
■ - IEC 61000-4-5:2005
■ - IEC 61000-4-6:2008
☐ - IEC 61000-4-8:2003
■ - IEC 61000-4-11:2004

Symbol Definitions:

■ - Applicable
☐ - Not Applicable

Note: For undated references, the latest edition of the publication at the time of testing (including amendments) was applied.

Environmental Conditions In The Laboratory:

	Actual
Temperature:	: 24 °C
Relative Humidity:	: 57 %
Atmospheric Pressure:	: 1009 mBar

Power Supply Utilized:

Power supply system : 220-240V~ / 50 or 60 Hz / 1ϕ

Symbol Definitions:

■ - Applicable
☐ - Not Applicable

Immunity Test Conditions: ELECTROSTATIC DISCHARGE (ESD)

The immunity against *ELECTROSTATIC DISCHARGE (ESD)* events was performed in the following location:

☐ **- Test not applicable**

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	SUG61002BG	Prima	ESD Generator	PR15062929
■ -	---	---	Horizontal Coupling Plane	---
■ -	---	---	Vertical Coupling Plane	---

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Discharge Voltage (Air):
☐ - 2 kV ■ - 8 kV ☐ - 6 kV
☐ - 4 kV ☐ - 15 kV ☐ - _ kV

Discharge Voltage (Contact):
☐ - 2 kV ☐ - 6 kV ☐ - _ kV
■ - 4 kV ☐ - 8 kV

Discharge Impedance:
■ - 330 Ω / 150 pF ☐ - 150 Ω / 150 pF

Discharge Repetition Rate:
■ - ≥ 1 sec.

Number of Discharges:
■ - ≥ 10 at all locations

Kind of Discharges:
■ - Air discharge ■ - Conducted discharge (relay)
■ - Direct ■ - Indirect

Polarity:
■ - Positive ■ - Negative

Location of Discharge:
☐ - See Data Record(s) in Appendix A
■ - Each location on the surface touchable by hand
☐ - See drawing in Appendix A
■ - HCP, VCP

Result :

■ - No degradation of function - Met Criterion A
☐ - Distortion of function - Met Criterion B
☐ - Error of function - Met Criterion C
☐ - Loss of function - Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: RADIATED ELECTROMAGNETIC FIELDS

The immunity against *RADIATED ELECTROMAGNETIC FIELDS* exposure was performed in the following location:

☐ **- Test not applicable**

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■-	E4421B	Agilent	Signal Generator	MY43350935
■-	KAW 2180	A&R	Power Amplifier	10088-2
■-	438A	HP	Power Meter	2517A02731
■-	8481D	HP	Power Sensor	3318A13765
■-	AT1080	A&R	Antenna	19300
■-	FM2000	A&R	Field Monitor	19221
■-	FP2036	A&R	Field Probe	308920
■-	DC6180	A&R	DDC	19326
☐-	DC7144A	A&R	DDC	310049

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Frequency Range:	☐ - 27 MHz - 500 MHz	☐ - 26 MHz - 1000 MHz	
	☐ - 9 kHz - 27 MHz	■ - 80 MHz - 1000 MHz	
Field Strength:	☐ - 1 V/m	■ - 3 V/m	
	☐ - 10 V/m	☐ - _ V/m	
Distance Antenna - EUT:	☐ - 1 m	■ - 3 m	
Modulation:	■ - AM :	80 %	1 kHz
	☐ - FM :	__ kHz dev.	__ kHz
	■ - sine wave:		
	☐ - unmodulated		
	☐ - Pulse	ON/OFF	Duty Cycle: __ %
Step:	☐ -≤ 0.0015 decades / sec		■ - 1%
Polarization of Antenna:	■ - Horizontal	■ - Vertical	

Result :

■ - No degradation of function	- Met Criterion A
☐ - Distortion of function	- Met Criterion B
☐ - Error of function	- Met Criterion C
☐ - Loss of function	- Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: FAST TRANSIENTS (BURST)

The immunity against *FAST TRANSIENTS (BURST)* events was performed in the following test location:

☐ **- Test not applicable**

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	EFT61004A	Prima	EFT Generator	PR11034301

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Pulse Amplitude - AC Power Port:	■ - 1,0 kV	☐ - 2,0 kV	
	☐ - 4,0 kV	☐ - ___ kV	
Pulse Amplitude - DC Power Port:	☐ - 1,0 kV	☐ - 2,0 kV	
	☐ - 4,0 kV	☐ - ___ kV	
Pulse Amplitude - Signal/Data	☐ - 0,5 kV	☐ - 1,0 kV	
Non control Port:	☐ - 2,0 kV	☐ - ___ kV	
Pulse Amplitude - Process:	☐ - 0,5 kV	☐ - 1,0 kV	
Measurement & Control Port	☐ - 2,0 kV	☐ - ___ kV	
Burst Frequency:	☐ - 2,5 kHz	■ - 5,0 kHz	☐ - ___ kHz
Time of Coupling:	☐ - 60 seconds	■ - 120 seconds	
Coupling Method:	■ - Coupling/decoupling network		☐ - Coupling clamp
Polarity:	■ - Positive	■ - Negative	

Immunity Test Conditions: FAST TRANSIENTS (BURST), continued

Location of Coupling:

name of lines:	Input A.C. power line	
type of lines:	☐ - shielded	■ - unshielded
status of lines:	☐ - passive	■ - active
kind of transmission:	■ - analog	☐ - digital
length of lines:	0.5m	
name of lines:		
type of lines:	☐ - shielded	☐ - unshielded
status of lines:	☐ - passive	☐ - active
kind of transmission:	☐ - analog	☐ - digital
length of lines:		
name of lines:		
type of lines:	☐ - shielded	☐ - unshielded
status of lines:	☐ - passive	☐ - active
kind of transmission:	☐ - analog	☐ - digital
length of lines:		

Result :

■ - No degradation of function	- Met Criterion A
☐ - Distortion of function	- Met Criterion B
☐ - Error of function	- Met Criterion C
☐ - Loss of function	- Unrecoverable Failure

Remarks:

Immunity Test Conditions: SURGE TRANSIENTS

The immunity against *SURGE TRANSIENTS* events was performed in the following test location:

☐ **- Test not applicable**

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	SUG61005BG	Prima	Surge Generator	PR13015542

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Pulse Amplitude - AC Power Port:	■ - 1,0 kV (phase and phase) (phase and neutral)	■ - 2,0 kV (phase and protective earth) (neutral and protective earth)
	For BCW098 LED40/CW PSU L1200 and BCW098 LED40/NW PSD L1200	
	■ - 0,5 kV (phase and phase) (phase and neutral)	■ - 1,0 kV (phase and protective earth) (neutral and protective earth)
	For BCW098 LED20/NW PSU L600	
Pulse Amplitude - DC Power Port:	☐ - 1,0 kV ☐ - 4,0 kV	☐ - 2,0 kV ☐ - ___ kV
Pulse Amplitude - Signal/Data Non control Port:	☐ - 0,5 kV ☐ - 2,0 kV	☐ - 1,0 kV ☐ - ___ kV
Pulse Amplitude - Process: Measurement & Control Port	☐ - 0,5 kV ☐ - 2,0 kV	☐ - 1,0 kV ☐ - ___ kV
Source Impedance:	■ - 2 Ω + 18 µF (phase and phase) (phase and neutral)	■ - 12 Ω + 9 µF (phase and protective earth) (neutral and protective earth)
	☐ - 42 Ω + 0,1 µF	☐ - 42 Ω + 0,5 µF
Number of Surges:	☐ - 10 surges/angle	■ - 5 surges /angle
Angle:	☐ - 0 ° ■ - 270 °	■ - 90 °
Repetition Rate:	■ - 60 sec.	☐ - ___ sec.
Polarity:	■ - Positive	■ - Negative

Immunity Test Conditions: **SURGE TRANSIENTS**, continued

Location of Coupling:

name of lines:	Input A.C. power line	
type of lines:	☐ - shielded	■ - unshielded
status of lines:	☐ - passive	■ - active
kind of transmission:	■ - analog	☐ - digital
length of lines:	1m	

name of lines:		
type of lines:	☐ - shielded	☐ - unshielded
status of lines:	☐ - passive	☐ - active
kind of transmission:	☐ - analog	☐ - digital
length of lines:		

name of lines:		
type of lines:	☐ - shielded	☐ - unshielded
status of lines:	☐ - passive	☐ - active
kind of transmission:	☐ - analog	☐ - digital
length of lines:		

Result:

■ - No degradation of function	- Met Criterion A
☐ - Distortion of function	- Met Criterion B
☐ - Error of function	- Met Criterion C
☐ - Loss of function	- Unrecoverable Failure

Remarks:

Immunity Test Conditions: CONDUCTED DISTURBANCE

The immunity against *CONDUCTED DISTURBANCE* events, induced by radio frequency fields above 9 kHz, was performed in the following test location:

☐ - Test not applicable

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■ -	8648A	HP	Signal Generator	3636A02166
■ -	100A250	A&R	Power Amplifier	19367
■ -	FCC-801-M3-25A	FCC	CDN	105
☐ -	FCC-801-M2-25	FCC	CDN	48
■ -	438A	HP	Power Meter	2517A0273
■ -	8482B	HP	Power Sensor	3318A06358
■ -	DTS 150	---	Attenuator	13071901

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Frequency Range:	☐ - 0,15 MHz - 230 MHz		■ - 0,15 MHz - 80 MHz
Voltage Level (EMF):	☐ - 1 V	■ - 3 V	
	☐ - 10 V	☐ - __ V	
Modulation:	■ - AM :	80 %	1 kHz
	☐ - FM :	__ kHz dev.	___ kHz
	■ - sine wave:		
	☐ - unmodulated		
	☐ - Pulse	ON/OFF	Duty Cycle: __ %
Step:	☐ -≤ 0.0015 decades / sec	■ 1%3sec	

Immunity Test Conditions: CONDUCTED DISTURBANCE, continued

Location of Coupling:

name of lines:	Input A.C. power line	
type of lines:	☐ - shielded	■ - unshielded
status of lines:	☐ - passive	■ - active
kind of transmission:	■ - analog	☐ - digital
length of lines:	0.3m	
name of lines:		
type of lines:	☐ - shielded	☐ - unshielded
status of lines:	☐ - passive	☐ - active
kind of transmission:	☐ - analog	☐ - digital
length of lines:		
name of lines:		
type of lines:	☐ - shielded	☐ - unshielded
status of lines:	☐ - passive	☐ - active
kind of transmission:	☐ - analog	☐ - digital
length of lines:		

Result :

■ - No degradation of function	- Met Criterion A
☐ - Distortion of function	- Met Criterion B
☐ - Error of function	- Met Criterion C
☐ - Loss of function	- Unrecoverable Failure

Remarks:

Immunity Test Conditions: PF FREQUENCY MAGNETIC FIELD

The immunity against *PF FREQUENCY MAGNETIC FIELD* exposure, induced by power frequency magnetic fields, was performed in the following test location:

■ - Test not applicable

☐ - Test Area - H

Test Equipment Used :

	Model Number	Manufacturer	Description	TUV PS Number
☐-	DP4-AA	TOKY	Amperemeter	487/310301
☐ -	INA2170	Schaffner	Magnetic Field Coil	487/440201
☐ -	4500L	California Instrument	Power Source	707/689501

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Frequency Range:	☐ - 50 Hz	☐ - 60 Hz	☐ - 400 Hz
Field level (EMF):	☐ - 1 A/m ☐ - 30 A/m	☐ - 3 A/m ☐ - 100 A/m	☐ - 10 A/m ☐ - ___ A/m
Short Field (1-3 sec):	☐ - 300 A/m	☐ - 1000 A/m	☐ - ___ A/m
Duration:	☐ - __ seconds		
Axis of Orientation:	☐ - X-axis	☐ - Y-axis	☐ - Z-axis

Result :

☐ - No degradation of function	- Met Criterion A
☐ - Distortion of function	- Met Criterion B
☐ - Error of function	- Met Criterion C
☐ - Loss of function	- Unrecoverable Failure

Remarks: _____

Immunity Test Conditions: VOLTAGE DIPS, INTERRUPTIONS & VARIATIONS

The immunity against *VOLTAGE DIPS, INTERRUPTIONS & VARIATIONS* events, induced by radio frequency fields above 9 kHz, was performed in the following test location:

☐ **- Test not applicable**

■ - Test Area – H

Test Equipment Used :

	Model Number	Manufacturer	Description	S/N
■-	CE Master	KeyTek	Test System	9609367

Remarks: Test equipment used is calibrated on a regular basis.

Test Specification:

Nominal Mains Voltage (U_T): ■ - 230 Vac ☐ -___ Vac ☐ - ___ Vdc

Level of Reduction (dip):
☐ - 1000 ms voltage dips in 30% of U_T
☐ - 500 ms voltage dips in 30% of U_T
☐ - 200 ms voltage dips in 60% of U_T
■ - 200 ms voltage dips in 70% of U_T

Duration of Interruption (0%*U_T): ☐ - 5000 ms ■ - 10 ms

Voltage Fluctuation: ☐ - U_T + 10% ☐ - U_T - 10%

Result :

☐ - No degradation of function - Met Criterion A
■ - Distortion of function - Met Criterion B
☐- Error of function - Met Criterion C
☐ - Loss of function - Unrecoverable Failure

Remarks: During the test of voltage dips in 70% of UT and 0% of UT, the EUT flicked when adding the Interference. after removing the interference, The EUT restores normal status automatically.

Equipment Under Test (EUT) Test Operation Mode - Immunity Tests:

The equipment under test was operated under the following conditions during immunity testing:

☐ - Standby

☐ - Test Program (H - Pattern)

☐ - Test Program (Color Bar)

☐ - Test Program (Customer Specified)

■ - Normal Operating Mode

■ - Light On, 50% light output.

Configuration of the equipment under test:

■ - See Constructional Data Form in Appendix A

■ - See Product Information Form(s) in Appendix A

The following peripheral devices and interface cables were connected during the testing:

■ - Light Modulator (Philips)	Type : BS0112350
☐ -	Type :
☐ -	Type :
☐ -	Type :
☐ -	Type :
☐ -	Type :
☐ -	Type :
☐ -	Type :
☐ -	Type :

■ - unshielded power cable

☐ - unshielded cables

☐ - shielded cables TÜVPS. No.:

☐ - customer specific cables

☐ -

☐ -

GENERAL REMARKS:

According to the client's declaration, Model BCW098 LED20/NW PSU L600 and BCW098 LED20/CW PSU L600 are identical except the model name;
Model BCW098 LED40/NW PSU L1200 and BCW098 LED40/CW PSU L1200 are identical except the model name;
Model BCW098 LED40/NW PSD L1200 and BCW098 LED40/CW PSD L1200 are identical except the model name.
So model BCW098 LED20/NW PSU L600, BCW098 LED40/CW PSU L1200 and BCW098 LED40/NW PSD L1200 were chosen to perform all the tests.

SUMMARY:

All tests according to the regulations cited on page 3 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements cited on page 3.

☐ - **Does not** fulfill the general approval requirements cited on page 3.

Testing Start Date: September 26, 2015

Testing End Date: October 09, 2015

- TÜV SÜD CERTIFICATION AND TESTING (CHINA) CO., LTD. SHANGHAI BRANCH-

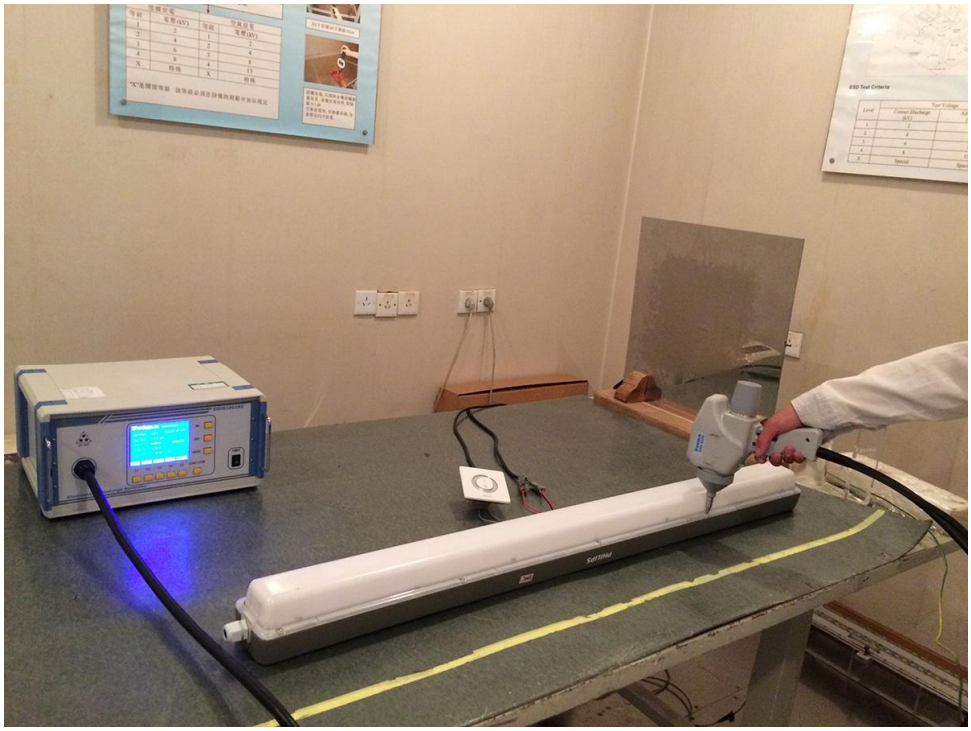
Reviewed by: Liping Xue 11-3, 2015
Liping XUE
Review Engineer

Prepared by: Wenwen Cheng 11-3, 2015
Wenwen CHENG
Project Engineer

Photograph of Test Setup:
Electrostatic Discharge (ESD)

☐ - Test not applicable

IEC 61000-4-2
EN 61000-4-2



Photograph of Test Setup:
Radiated Electromagnetic Field

☐ **- Test not applicable**

IEC 61000-4-3
EN 61000-4-3

Photograph of Test Setup:
Fast transients (BURST)

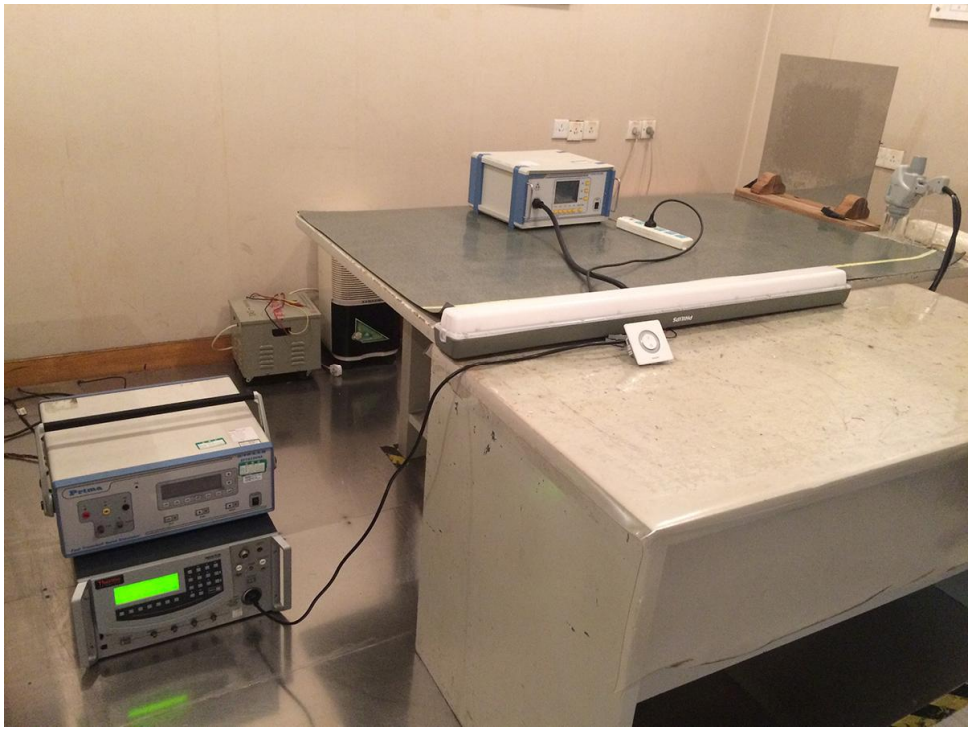
☐ **- Test not applicable**

IEC 61000-4-4
EN 61000-4-4

Photograph of Test Setup:
SURGE transients

☐ - **Test not applicable**

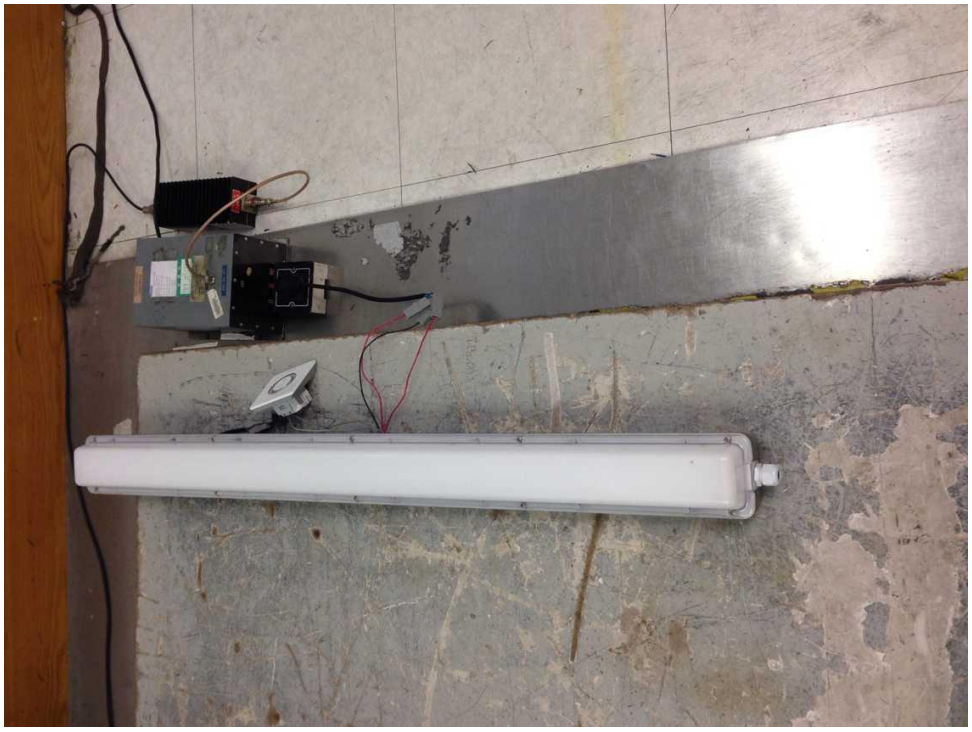
IEC 61000-4-5
EN 61000-4-5



Photograph of Test Setup:
Conducted disturbance

☐ **- Test not applicable**

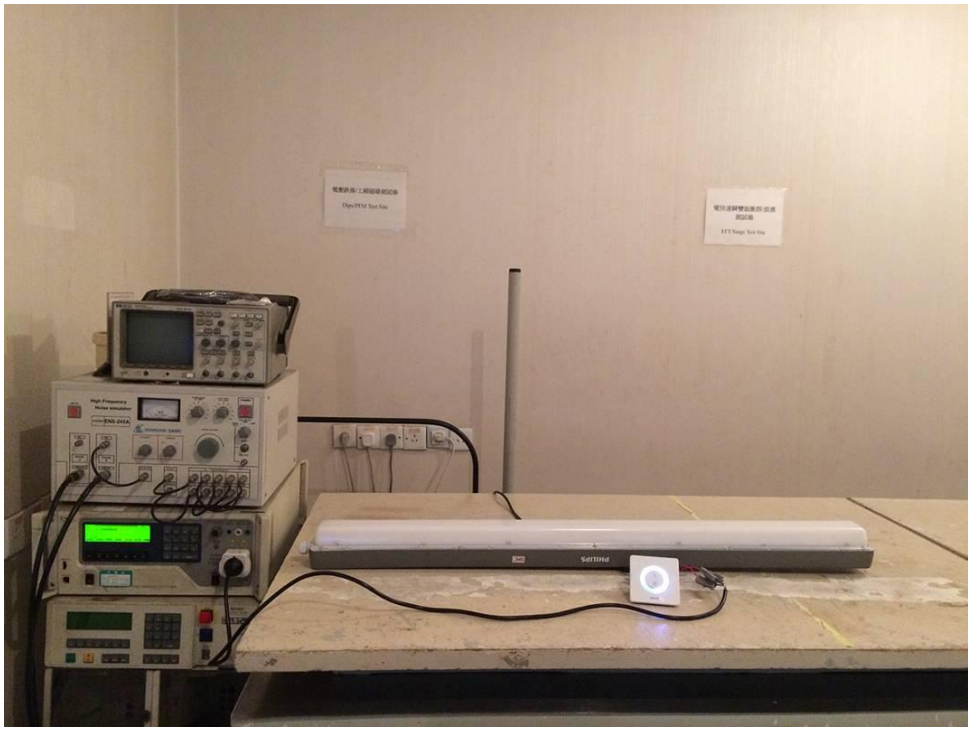
IEC 61000-4-6
EN 61000-4-6



Photograph of Test Setup:
Voltage Dips, Interruptions & Variations

☐ **- Test not applicable**

IEC 61000-4-11
EN 61000-4-11



Appendix A

Constructional Data Form

and

Product Information Form(s)

Please refer to EMC EMISSION-TEST REPORT Appendix B

Appendix B

Photo documents

of

Equipment Under Test (EUT)

Please refer to EMC EMISSION-TEST REPORT Appendix C