

EMC TEST REPORT

For

CLF LIGHTING B.V.

CLF Xena RGBW Par

Model No.: CLF Xena RGBW Par, CLF Quadcolor Mini Par

Prepared for : CLF LIGHTING B.V.
Address : Handelstraat 25 6851 EH Huissen

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APPENDIX (Photos of EUT) (5 pages)

TEST REPORT VERIFICATION

Applicant : CLF LIGHTING B.V.
Manufacturer : CLF LIGHTING B.V.
EUT : CLF Xena RGBW Par
Model No. : CLF Xena RGBW Par, CLF Quadcolor Mini Par
Input Rating : AC 100-240V, 50/60Hz

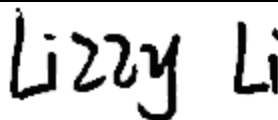
Measurement Procedure Used:

EN 55015: 2013+A1: 2015
EN 61000-3-2: 2014, EN 61000-3-3: 2013
EN 61547: 2009
(IEC 61000-4-2: 2008, IEC 61000-4-3: 2006+A1: 2007+A2: 2010, IEC 61000-4-4: 2012,
IEC 61000-4-5: 2014, IEC 61000-4-6: 2013, IEC 61000-4-11: 2004)

The device described above is tested by EMTEK(DONGGUAN) CO., LTD. and EMTEK(SHENZHEN) CO., LTD to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK(DONGGUAN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the EN55015, EN61000-3-2, EN61000-3-3 and EN61547 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK(DONGGUAN) CO., LTD.

Date of Test : February 13, 2017 to May 14, 2017



Prepared by :

Lizzy Li/ Editor



Reviewer :

Rance Ye/ Supervisor

Approved & Authorized Signer :



Sam Lv/ Manager

Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	ED170213031E

1. DESCRIPTION OF STANDARDS AND RESULTS (EUT)

EMISSION			
Description of Test Item	Standard	Limits	Results
Disturbance Voltage at the Mains Terminal	EN 55015: 2013+A1: 2015	Table 2a	Pass
Radiated Disturbance	EN 55015: 2013+A1: 2015	Table 3b	Pass
Magnetic Field Emission Measurement	EN 55015: 2013+A1: 2015	Table 3a	Pass
Harmonic Current Emissions	EN 61000-3-2: 2014	Class C	Pass
Voltage Fluctuation and Flicker	EN 61000-3-3: 2013	Section 5	Pass
IMMUNITY			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2: 2008	B	Pass
RF Field Strength Susceptibility (R/S)	IEC 61000-4-3: 2006+A1: 2007+A2: 2010	A	Pass
Electro Fast Transient (EFT)	IEC 61000-4-4: 2012	B	Pass
Surge (Input AC Power Port)	IEC 61000-4-5: 2014	C	Pass
Radio-Frequency, Continuous Conducted Disturbance	IEC 61000-4-6: 2013	A	Pass
Power Frequency Magnetic Field	IEC 61000-4-8: 2009	A	N/A
Voltage Interruptions, 100%	IEC 61000-4-11: 2004	B	Pass
Voltage Dips, 30% Reduction		C	
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1 Description of Device (EUT)

EUT	: CLF Xena RGBW Par
Model Number	: CLF Xena RGBW Par, CLF Quadcolor Mini Par (Note: The samples are the same except appearance and model number. So CLF Xena RGBW Par was selected for full tested.)
Trade Mark	: 
Power Supply for Test	: AC 230V/50Hz
Operate mode	: ON
Applicant	: CLF LIGHTING B.V.
Address	: Handelstraat 25 6851 EH Huissen
Manufacturer	: CLF LIGHTING B.V.
Address	: Handelstraat 25 6851 EH Huissen
Date of sample receiver	: February 13, 2017
Date of Test	: February 13, 2017 to May 14, 2017

2.2 Description of Test Facility

Site Description EMC Lab.	: Accredited by CNAS, 2015.09.24 The certificate is valid until 2018.07.03 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006 The Certificate Registration Number is L3150 Registered on FCC, July 06, 2016 The Certificate Number is 247565. Registered on Industry Canada, January 13, 2017 The Certificate Number is 9444A.
Name of Firm	: EMTEK(DONGGUAN) CO., LTD.
Site Location	: No.281, Guantai Road, Nancheng District, Dongguan, Guangdong, China

2.3 Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission Uncertainty	: 2.42dB
Radiated Emission Uncertainty (3m Chamber)	: 3.34dB (30M~1GHz Polarize: H) 3.32dB (30M~1GHz Polarize: V)
Magnetic Emission Uncertainty	2.8dB
Uncertainty for Flicker test	: 0.25%
Uncertainty for Harmonic test	: 0.014%
Uncertainty for C/S Test	: 1.45(Using CDN Test) 2.37(Using EM Clamp Test)
Uncertainty for R/S Test	: 2.10dB(80MHz-200MHz) 1.76dB(200MHz-1000MHz)
Uncertainty for test site temperature and humidity	: 0.6℃ 4%

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1 For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde&Schwarz	ESCI	100137	May 16, 2016	1 Year
2.	L.I.S.N.	Rohde&Schwarz	ENV216	100017	May 16, 2016	1Year
3.	RF Switching Unit	CDS	RSU-M2	38401	May 16, 2016	1Year

3.2 For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	100137	May 16, 2016	1 Year
2.	Bilog Antenna	Schwarzbeck	VULB9163	000141	May 16, 2016	1 Year
3.	Power Amplifier	CDS	RSU-M352	818	May 16, 2016	1 Year
4.	Power Amplifier	HP	8447F	OPT H64	May 16, 2016	1 Year
5.	Color Monitor	SUNSPO	SP-140A	N/A	May 16, 2016	1 Year
6.	Single Line Filter	JIANLI	XL-3	N/A	May 16, 2016	1 Year
7.	Single Phase Power Line Filter	JIANLI	DL-2X100B	N/A	May 16, 2016	1 Year
8.	3 Phase Power Line Filter	JIANLI	DL-4X100B	N/A	May 16, 2016	1 Year
9.	DC Power Filter	JIANLI	DL-2X50B	N/A	May 16, 2016	1 Year
10.	Cable	Schwarzbeck	PLF-100	519489	May 16, 2016	1 Year
11.	Cable	Rosenberger	CIL02	A0783566	May 16, 2016	1 Year
12.	Cable	Rosenberger	RG 233/U	525178	May 16, 2016	1 Year

3.3 For Magnetic Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 16, 2016	1 Year
2.	Loop Antenna	Laplace Instrument Ltd	RF300	8006	May 16, 2016	1 Year
3.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 16, 2016	1 Year
4.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	May 16, 2016	1 Year
5.	Coaxial Switch	Anritsu	MP59B	M73989	May 16, 2016	1 Year

3.4 For Harmonic Current / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	EMTEST	DPA500	U0526100506	May 16, 2016	1 Year
2.	AC Frequency Conversion Power	EMTEST	ACS 500	V526100507	May 16, 2016	1 Year
3.	PC	LENOVO	T2900D	SS12485803	May 16, 2016	1 Year

3.5 For Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	ESD Tester	SCHAFFNER	NSG432	1285	May 16, 2016	1 Year

3.6 For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 16, 2016	1 Year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 16, 2016	1 Year
3.	Broad-Band Horn Antenna	SCHWARZBECK	BBHA9120 L3F	332	May 16, 2016	1 Year
4.	Power Amplifier	PRANA	AP32MT215	N/A	May 16, 2016	1 Year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	May 16, 2016	1 Year
6.	Signal Generator	AEROFLEX	2023B	N/A	May 16, 2016	1 Year
7.	Field Strength Meter	HOLADAY	HI-6005	N/A	May 16, 2016	1 Year
8.	RS232 Fiber Optic Modem	HOLADAY	HI-4413P	N/A	May 16, 2016	1 Year
9.	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May 16, 2016	1 Year

3.7 For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	EM TEST	UCS500M6B	V0526100502	May 16, 2016	1 Year
2.	Coupling Clamp	EM TEST	HFK	0605-10	May 16, 2016	1Year

3.8 For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Generator	EM TEST	VCS 500M6T	V0526100503	May 16, 2016	1 Year

3.9 For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	FRANKONIA	CIT-10	126B121012012	May 17, 2016	1Year
2.	CDN	EM TEST	CDN-M2	100100100	May 17, 2016	1Year
3.	CDN	EM TEST	CDN-M3	0900-11	May 17, 2016	1 Year
4.	Injection Clamp	EM TEST	F-2031-23MM	368	May 17, 2016	1Year
5.	Attenuator	EM TEST	ATT6	0010222A	May 17, 2016	1Year

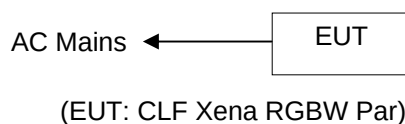
3.10 For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 17, 2016	1 Year
2.	Proflin2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	May 17, 2016	1 Year

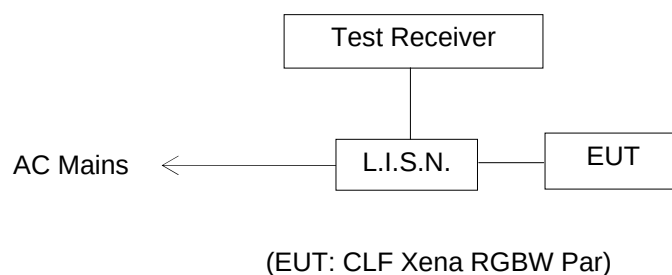
4. POWER LINE CONDUCTED MEASUREMENT

4.1 Block Diagram of Test Setup

4.1.1 Block diagram of connection between the EUT and simulators



4.1.2 Block Diagram of Test Setup



4.2 Conducted Power Line Emission Measurement Standard and Limits

4.2.1 Standard:

EN 55015: 2013+A1: 2015

4.2.2 Limits

Frequency	At mains terminals (dB μ V)	
	Quasi-peak Level	Average Level
9KHz ~ 50KHz	110	--
50KHz ~ 150KHz	90 ~ 80*	--
150KHz ~ 0.5MHz	66 ~ 56*	56 ~ 46*
0.5MHz ~ 5.0MHz	56	46
5.0MHz ~ 30MHz	60	50

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

4.3 EUT Configuration on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT : CLF Xena RGBW Par
Model Number : CLF Xena RGBW Par

4.4 Operating Condition of EUT

- 4.4.1 Setup the EUT as shown in Section 4.1.
- 4.4.2 Turn on the power of all equipments.
- 4.4.3 Let the EUT work in test mode (ON) and measure it.

4.5 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN55015 standard.

The bandwidth of the test receiver (ESCI) is set at 200Hz in 9KHz~150KHz range and 9KHz in 150KHz~30MHz range.

The frequency range from 9KHz to 30MHz is checked.

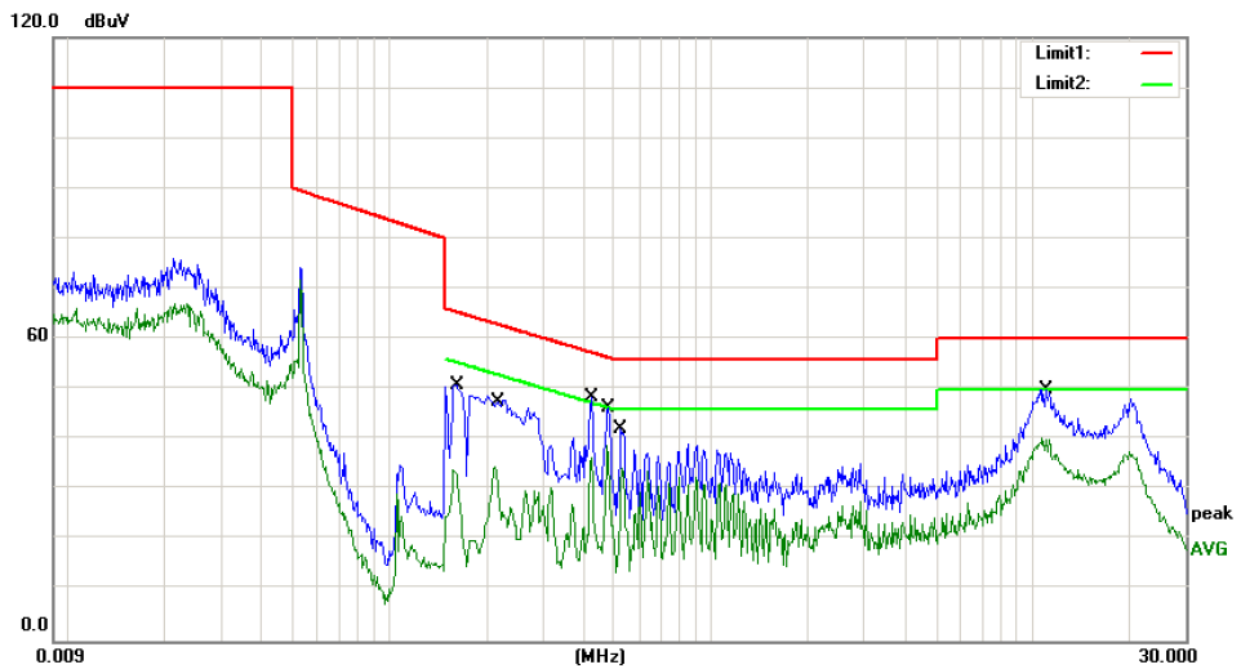
All the test results are listed in Section 4.6.

4.6 Measurement Results

PASS.

The frequency range from 9KHz to 30MHz is investigated.

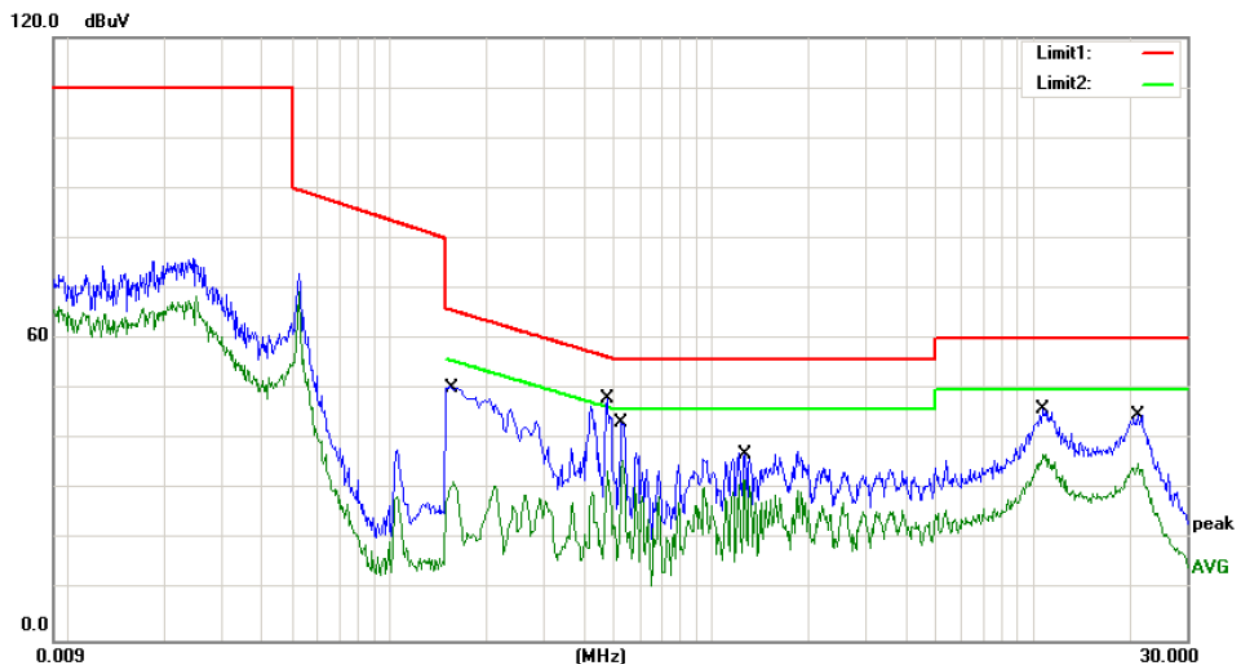
The test data are attached in the following pages.



Site site #1 Phase: **L1** Temperature: 24
 Limit: (CE)EN55015_QP Power: AC 230V/50Hz Humidity: 55 %
 Mode: ON
 Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1620	40.92	10.01	50.93	65.36	-14.43	QP	
2		0.1620	23.96	10.01	33.97	55.36	-21.39	AVG	
3		0.2140	38.58	10.03	48.61	63.05	-14.44	QP	
4		0.2140	24.64	10.03	34.67	53.05	-18.38	AVG	
5		0.4260	38.47	10.08	48.55	57.33	-8.78	QP	
6		0.4260	26.52	10.08	36.60	47.33	-10.73	AVG	
7		0.4820	36.36	10.10	46.46	56.30	-9.84	QP	
8	*	0.4820	28.63	10.10	38.73	46.30	-7.57	AVG	
9		0.5340	32.16	10.10	42.26	56.00	-13.74	QP	
10		0.5340	23.72	10.10	33.82	46.00	-12.18	AVG	
11		11.0580	39.87	10.22	50.09	60.00	-9.91	QP	
12		11.0580	30.14	10.22	40.36	50.00	-9.64	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Aspen



Site site #1

Phase: **N**

Temperature: 24

Limit: (CE)EN55015_QP

Power: AC 230V/50Hz

Humidity: 55 %

Mode: ON

Note:

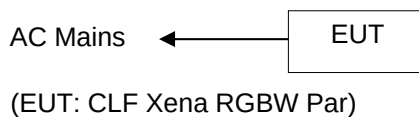
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1580	40.49	10.01	50.50	65.57	-15.07	QP	
2		0.1580	21.56	10.01	31.57	55.57	-24.00	AVG	
3	*	0.4780	37.97	10.09	48.06	56.37	-8.31	QP	
4		0.4780	23.59	10.09	33.68	46.37	-12.69	AVG	
5		0.5300	33.11	10.10	43.21	56.00	-12.79	QP	
6		0.5300	25.90	10.10	36.00	46.00	-10.00	AVG	
7		1.2700	27.23	10.10	37.33	56.00	-18.67	QP	
8		1.2700	21.96	10.10	32.06	46.00	-13.94	AVG	
9		10.7700	35.82	10.21	46.03	60.00	-13.97	QP	
10		10.7700	26.98	10.21	37.19	50.00	-12.81	AVG	
11		21.2660	34.42	10.41	44.83	60.00	-15.17	QP	
12		21.2660	24.91	10.41	35.32	50.00	-14.68	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Aspen

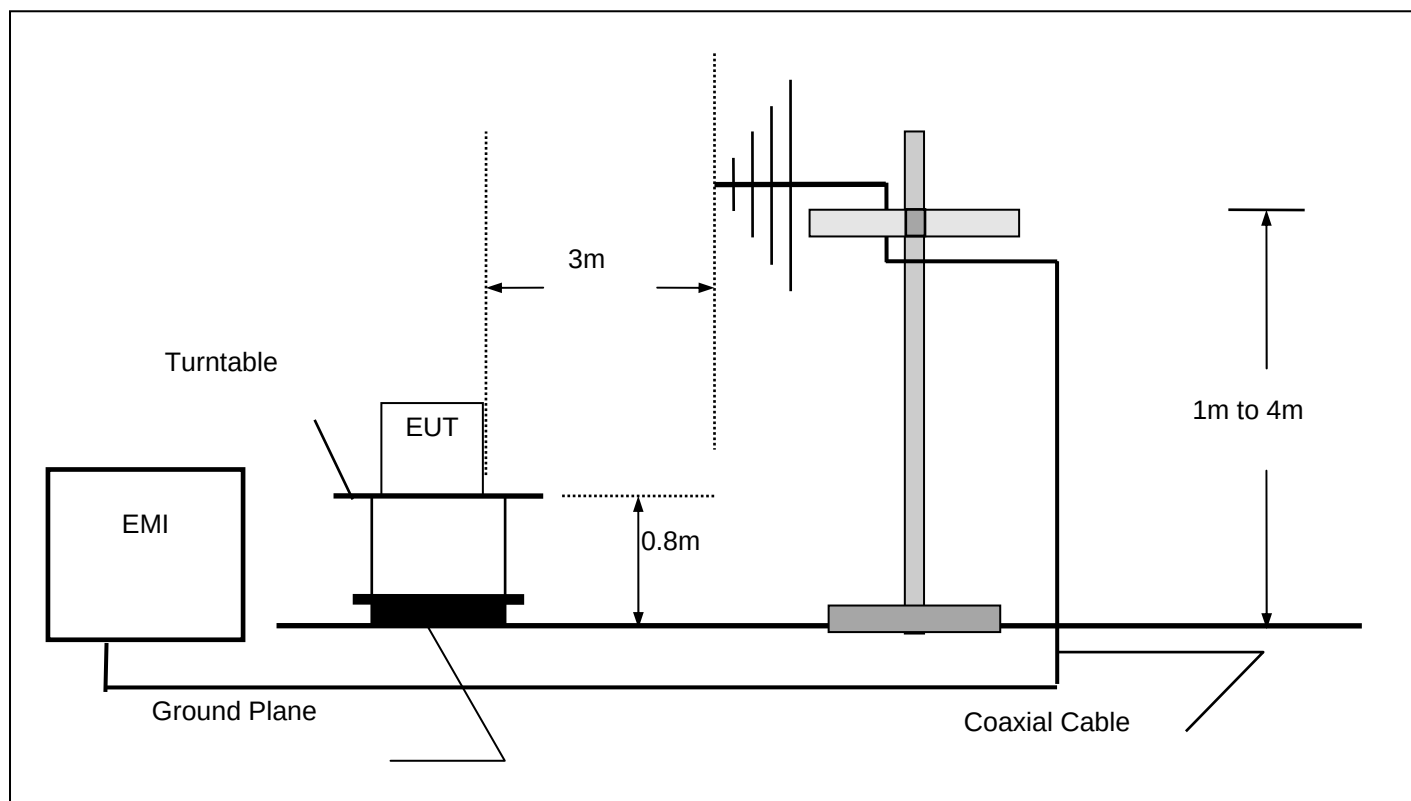
5. RADIATED EMISSION MEASUREMENT

5.1 Block Diagram of Test

5.1.1 Block diagram of connection between the EUT and simulators



5.1.2 Block diagram of test setup (In chamber)



(EUT: CLF Xena RGBW Par)

5.2 Measuring Standard

EN 55015: 2013+A1: 2015

5.3 Radiated Emission Limits

All emanations from a device or system shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30 ~ 230	3	40
230 ~ 300	3	47

- Note:
- (1) The smaller limit shall apply at the combination point between two frequency bands.
 - (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4 EUT Configuration on Test

The EN55015 regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT : CLF Xena RGBW Par

Model No. : CLF Xena RGBW Par

5.5 Operating Condition of EUT

5.5.1 Turn on the power.

5.5.2 Let the EUT work in test mode (ON) and measure it.

5.6 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meter to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCI) is set at 120kHz.

5.7 Test Results

PASS.

The frequency range from 30MHz to 300MHz is investigated.

The test data are attached in the following pages.



Site Chamber #1

Polarization: **Horizontal**

Temperature: 26

Limit: (RE)EN55015_3m

Power: AC 230V/50Hz

Humidity: 55 %

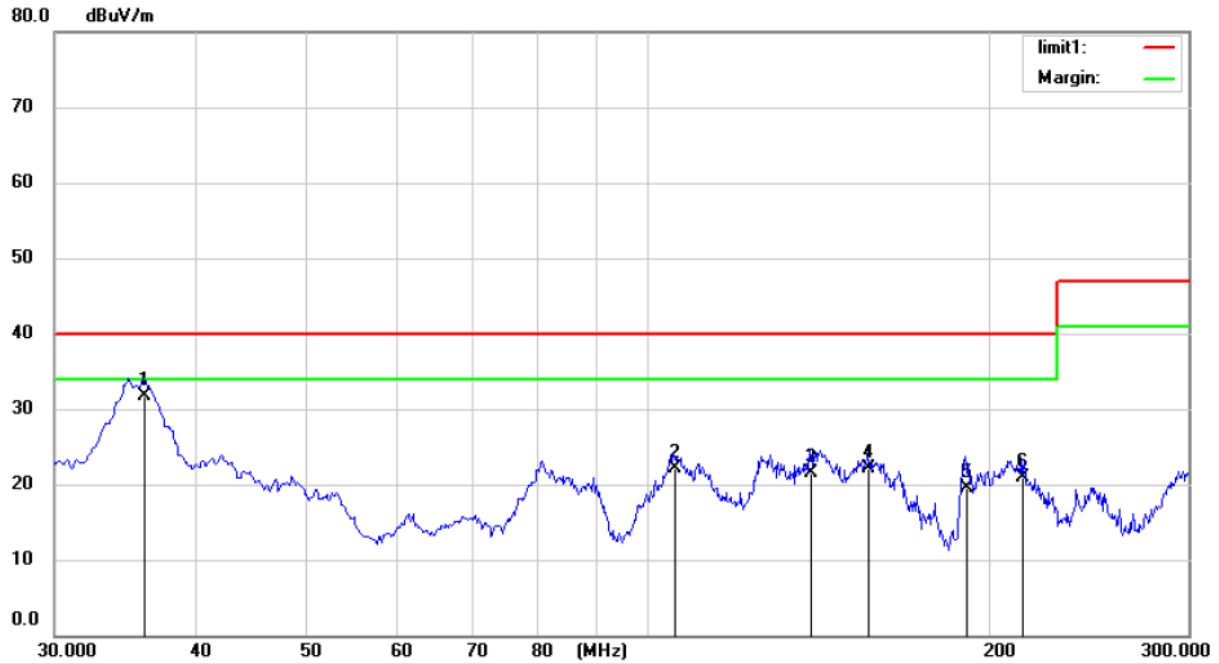
Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		36.2100	29.65	-13.91	15.74	40.00	-24.26	QP		
2		105.8700	36.85	-19.26	17.59	40.00	-22.41	QP		
3		140.9700	37.25	-18.25	19.00	40.00	-21.00	QP		
4		156.6300	36.55	-19.18	17.37	40.00	-22.63	QP		
5		180.3900	39.65	-19.85	19.80	40.00	-20.20	QP		
6	*	189.8400	41.35	-19.37	21.98	40.00	-18.02	QP		

*:Maximum data x:Over limit !:over margin

Operator: W



Site Chamber #1

Polarization: **Vertical**

Temperature: 26

Limit: (RE)EN55015_3m

Power: AC 230V/50Hz

Humidity: 55 %

Mode: ON

Note:

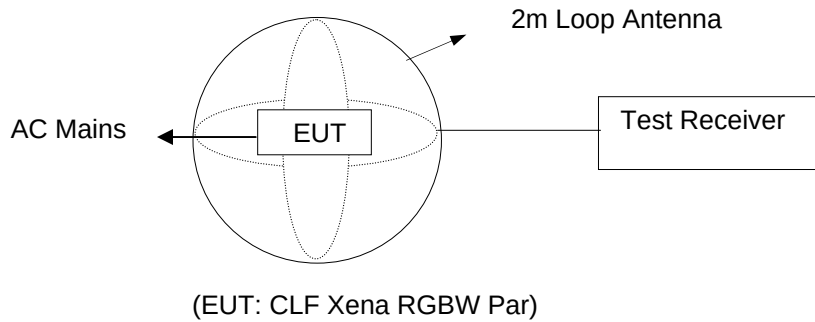
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	35.9400	45.60	-13.96	31.64	40.00	-8.36	QP		
2		105.6000	41.35	-19.29	22.06	40.00	-17.94	QP		
3		139.3500	39.58	-18.12	21.46	40.00	-18.54	QP		
4		156.6300	41.35	-19.18	22.17	40.00	-17.83	QP		
5		190.9200	38.89	-19.29	19.60	40.00	-20.40	QP		
6		213.8700	38.55	-17.66	20.89	40.00	-19.11	QP		

*:Maximum data x:Over limit !:over margin

Operator: W

6. MAGNETIC FIELD EMISSION MEASUREMENT

6.1 Block Diagram of Test Setup



6.2 Magnetic Field Emission Measurement Standard and Limits

6.2.1 Test Standard

EN 55015: 2013+A1: 2015

6.2.2 Test Limits

Frequency	Limits for loop diameter (dB μ A)
	2m
9KHz ~ 70KHz	88
70KHz ~ 150KHz	88 ~ 58*
150KHz ~ 3.0MHz	58 ~ 22*
3.0MHz ~ 30MHz	22

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

6.3 EUT Configuration on Measurement

The configuration of the EUT is same as Section 4.3.

6.4 Operating Condition of EUT

Same as conducted measurement which is listed in Section 4.4, except that the test setup replaced by Section 6.1.

6.5 Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter (R&S test receiver ESCS30) is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz.

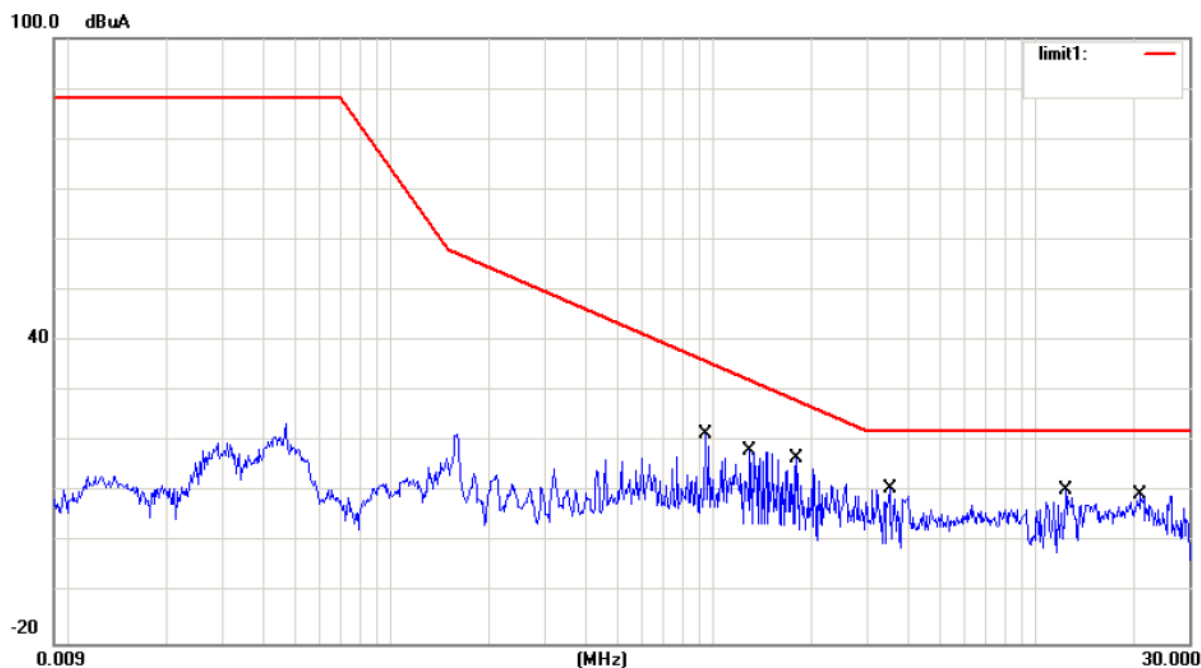
6.6 Test Results

PASS.

These test result outsourced to EMTEK(SHENZHEN) CO., LTD

The frequency range from 9KHz to 30MHz is investigated.

The test data are attached in the following pages.



Site site #1

Phase: **LOOP A**

Temperature: 22

Limit: (ME)EN55015

Power: AC 230V/50Hz

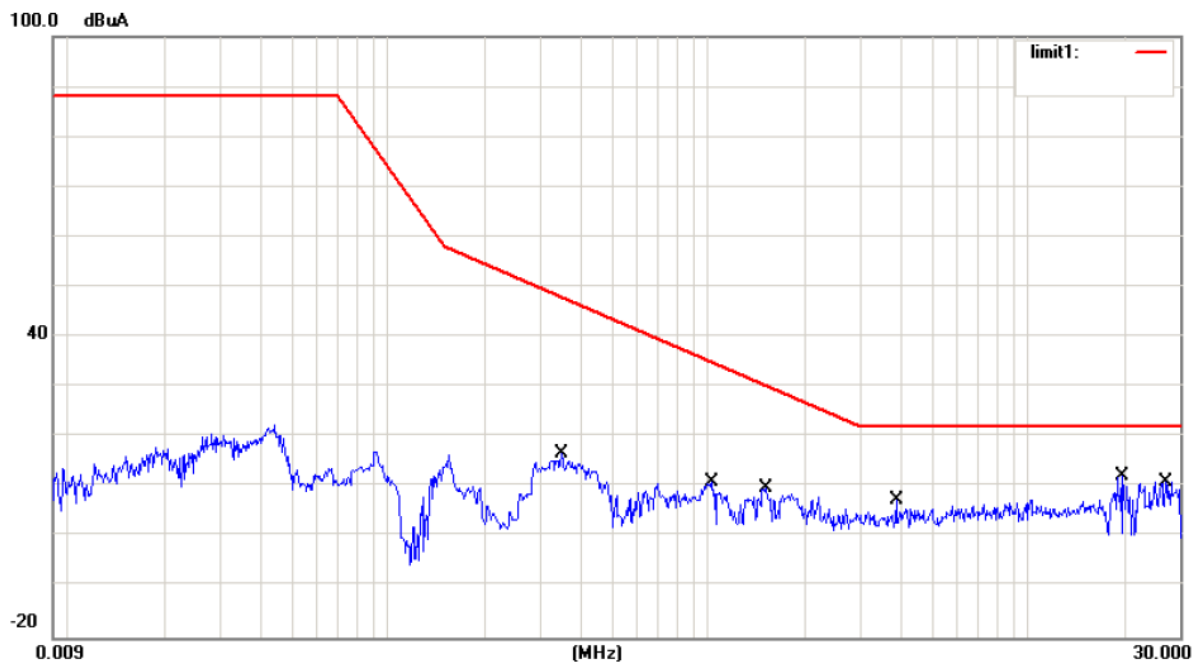
Humidity: 50 %

Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1		0.9500	11.76	9.84	21.60	35.82	-14.22	QP	
2		1.3060	8.48	9.85	18.33	31.99	-13.66	QP	
3	*	1.8180	6.86	9.85	16.71	28.02	-11.31	QP	
4		3.5500	0.77	9.86	10.63	22.00	-11.37	QP	
5		12.4420	-2.07	12.49	10.42	22.00	-11.58	QP	
6		21.1740	-4.74	14.23	9.49	22.00	-12.51	QP	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: ME



Site site #1

Limit: (ME)EN55015

Mode: ON

Note:

Phase: **LOOP B**

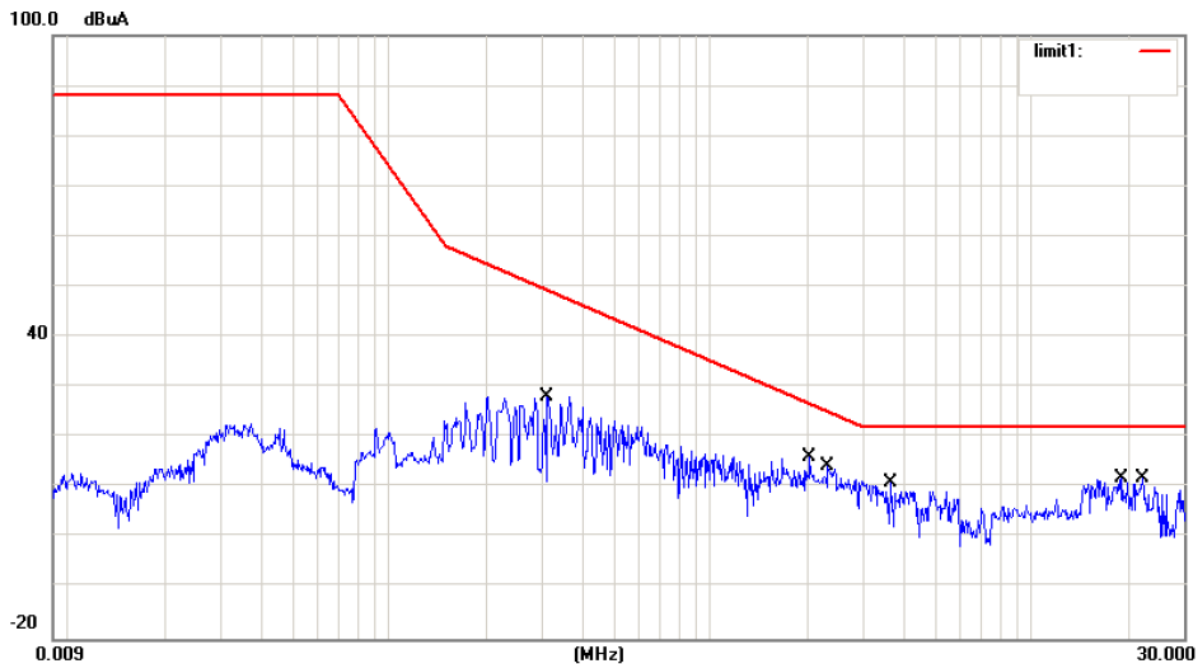
Power: AC 230V/50Hz

Temperature: 22

Humidity: 50 %

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuA	Factor	ment	dBuA	dB	Detector	Comment
1		0.3500	7.18	9.67	16.85	47.82	-30.97	QP	
2		1.0420	1.09	9.85	10.94	34.71	-23.77	QP	
3		1.5300	0.00	9.85	9.85	30.09	-20.24	QP	
4		3.9060	-2.54	9.86	7.32	22.00	-14.68	QP	
5	*	19.9820	-1.63	14.00	12.37	22.00	-9.63	QP	
6		27.1620	-4.23	15.43	11.20	22.00	-10.80	QP	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: ME



Site site #1

Limit: (ME)EN55015

Mode: ON

Note:

Phase: **LOOP C**

Power: AC 230V/50Hz

Temperature: 22

Humidity: 50 %

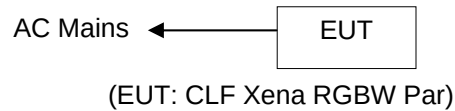
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuA	dB	dBuA	dBuA	dB		
1		0.3140	18.48	9.66	28.14	49.12	-20.98	QP	
2		2.0580	6.27	9.86	16.13	26.53	-10.40	QP	
3		2.3340	4.42	9.86	14.28	25.02	-10.74	QP	
4		3.6540	1.22	9.86	11.08	22.00	-10.92	QP	
5	*	19.3100	-1.90	13.86	11.96	22.00	-10.04	QP	
6		22.3780	-2.59	14.48	11.89	22.00	-10.11	QP	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: ME

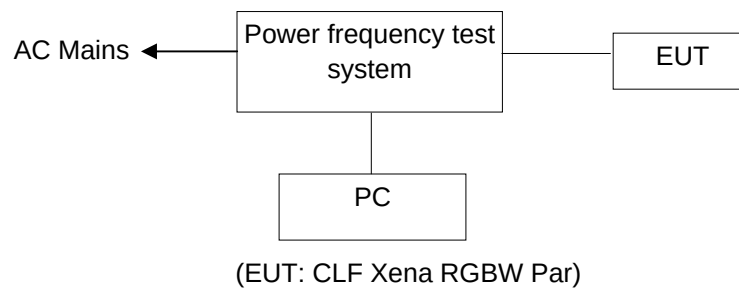
7. HARMONIC CURRENT MEASUREMENT

7.1 Block Diagram of Test Setup

7.1.1 Block diagram of connection between the EUT and simulators



7.1.2 Block Diagram of Test Setup



7.2 Measuring Standard

EN 61000-3-2: 2014

Class C

7.3 Operating Condition of EUT

- 7.3.1 Setup the EUT as shown in Section 7.1.
- 7.3.2 Turn on the power of all equipments.
- 7.3.3 Let the EUT work in test mode (ON) and measure it.

7.4 Test Results

PASS.

Please refer to the following page.

Test Report

Report title:	Harmonic
Company Name:	EMTEK
Date of test:	13:53 8.May 2017
Measurement file name:	Harmonics_3_2_Ed3.rsd
Tester:	Alan He
Standard used:	EN/IEC 61000-3-2 Ed.3 Long cyclic Equipment class C
Observation time:	150s
Windows width:	10 periods - (EN/IEC 61000-4-7 Edition 2002)
Customer:	CLF LIGHTING B.V.
E. U. T.:	CLF Xena RGBW Par
M/N	CLF Xena RGBW Par
MODE	ON
Measurement smoothed data:	Fund. Current: 0.307 A Power Factor : 0.932

Test Result	
E. U. T.:	PASS
Power Source:	PASS

E. U. T. Result

Check harmonics 2..40 [exception odd 21..39]:

Harmonic(s) > 150%:		
Order (n):	None	
Harmonic(s) with average > 100%:		
Order (n):	None	

Check odd harmonics 21..39:

All Partial Odd Harmonics below partial limits.		
Harmonic(s) > 150%:		
Order (n):	None	
Harmonic(s) with average > 150%:		
Order (n):	None	

Power Source Result

First dataset out of limit:		
DS (time):	None	
Harmonic(s) out of limit:		
Order (n):	None	

Harmonic current results - DS: 1

Hn	I _{eff} [A]	I _{eff} [%]	Limit [%]	Result
1	305.952E-3	99.812		
2	892.603E-6	0.291	2.00	PASS
3	19.898E-3	6.491	27.95	PASS
4	1.309E-3	0.427		PASS
5	11.166E-3	3.643	10.00	PASS
6	843.149E-6	0.275		PASS
7	9.561E-3	3.119	7.00	PASS
8	723.952E-6	0.236		PASS
9	9.778E-3	3.190	5.00	PASS
10	783.746E-6	0.256		PASS
11	8.109E-3	2.646	3.00	PASS
12	775.662E-6	0.253		PASS
13	3.820E-3	1.246	3.00	PASS
14	1.171E-3	0.382		PASS
15	1.417E-3	0.462	3.00	PASS
16	816.500E-6	0.266		PASS
17	722.520E-6	0.236	3.00	PASS
18	1.015E-3	0.331		PASS
19	985.943E-6	0.322	3.00	PASS
20	750.126E-6	0.245		PASS
21	1.181E-3	0.385	3.00	PASS
22	645.061E-6	0.210		PASS
23	2.241E-3	0.731	3.00	PASS
24	757.862E-6	0.247		PASS
25	1.965E-3	0.641	3.00	PASS
26	692.959E-6	0.226		PASS
27	1.286E-3	0.420	3.00	PASS
28	810.005E-6	0.264		PASS
29	1.530E-3	0.499	3.00	PASS
30	663.497E-6	0.216		PASS
31	1.304E-3	0.425	3.00	PASS
32	928.999E-6	0.303		PASS
33	1.511E-3	0.493	3.00	PASS
34	712.364E-6	0.232		PASS
35	844.923E-6	0.276	3.00	PASS
36	673.188E-6	0.220		PASS
37	1.021E-3	0.333	3.00	PASS
38	683.368E-6	0.223		PASS
39	1.053E-3	0.344	3.00	PASS
40	841.867E-6	0.275		PASS

Caution: Results related to the 100% limit values

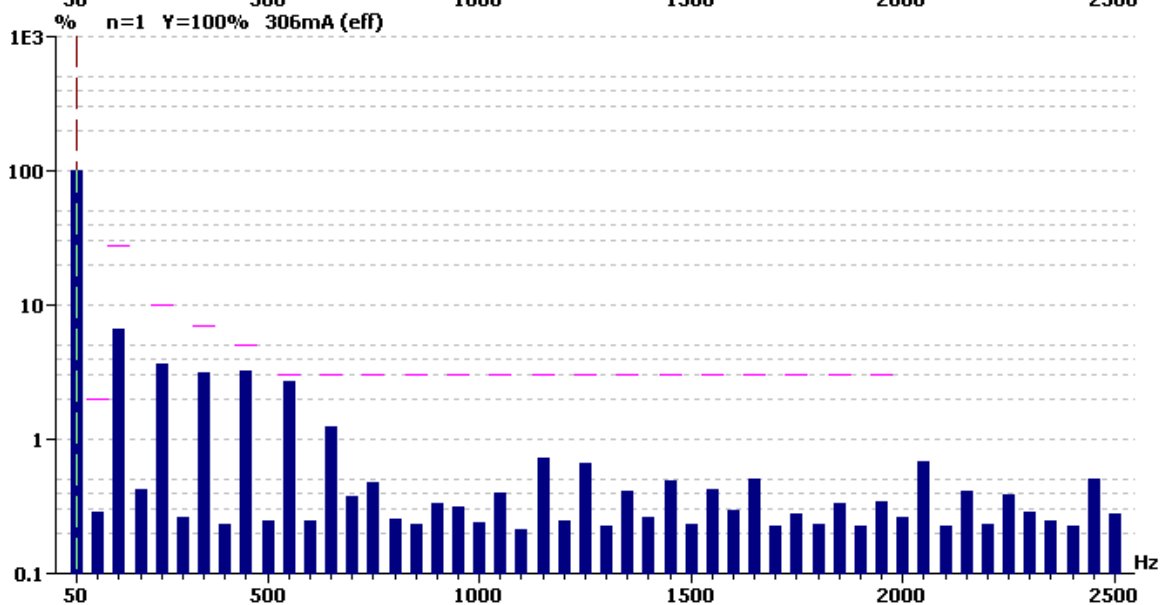
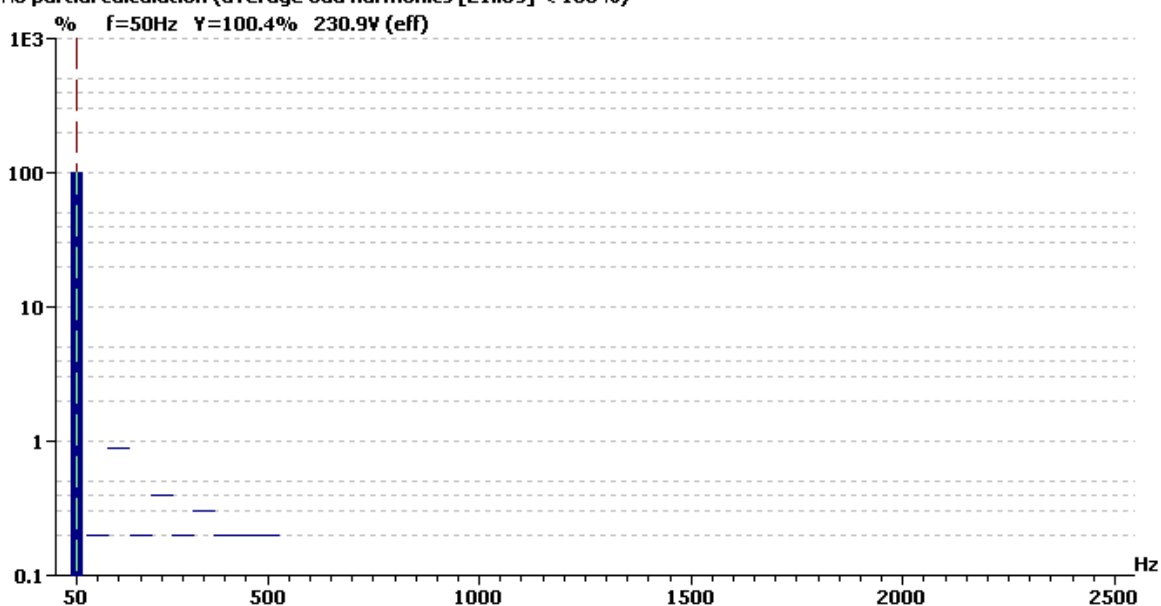
Harmonic voltage results - DS: 1

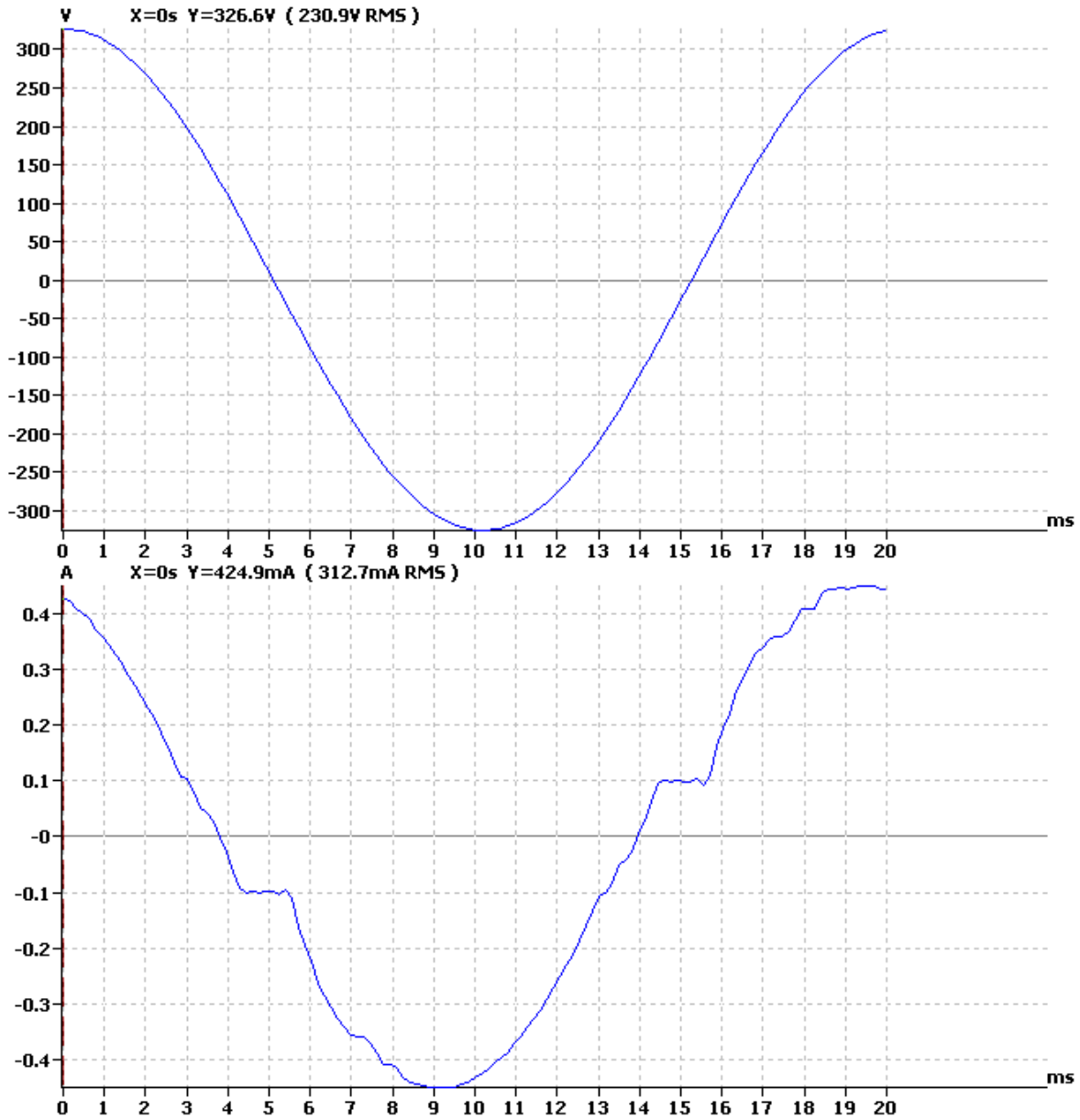
Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.86	100.374		
2	20.81E-3	0.009	0.2	PASS
3	12.90E-3	0.006	0.9	PASS
4	38.69E-3	0.017	0.2	PASS
5	67.80E-3	0.029	0.4	PASS
6	33.24E-3	0.014	0.2	PASS
7	64.60E-3	0.028	0.3	PASS
8	15.65E-3	0.007	0.2	PASS
9	44.36E-3	0.019	0.2	PASS
10	13.55E-3	0.006	0.2	PASS
11	51.05E-3	0.022	0.1	PASS
12	8.72E-3	0.004	0.1	PASS
13	15.33E-3	0.007	0.1	PASS
14	9.83E-3	0.004	0.1	PASS
15	105.51E-3	0.046	0.1	PASS
16	25.28E-3	0.011	0.1	PASS
17	33.54E-3	0.015	0.1	PASS
18	7.64E-3	0.003	0.1	PASS
19	72.72E-3	0.032	0.1	PASS
20	16.69E-3	0.007	0.1	PASS
21	43.35E-3	0.019	0.1	PASS
22	6.87E-3	0.003	0.1	PASS
23	57.87E-3	0.025	0.1	PASS
24	7.25E-3	0.003	0.1	PASS
25	42.09E-3	0.018	0.1	PASS
26	11.00E-3	0.005	0.1	PASS
27	39.91E-3	0.017	0.1	PASS
28	8.92E-3	0.004	0.1	PASS
29	54.00E-3	0.023	0.1	PASS
30	6.88E-3	0.003	0.1	PASS
31	24.16E-3	0.011	0.1	PASS
32	7.09E-3	0.003	0.1	PASS
33	42.58E-3	0.019	0.1	PASS
34	5.34E-3	0.002	0.1	PASS
35	18.04E-3	0.008	0.1	PASS
36	4.76E-3	0.002	0.1	PASS
37	52.75E-3	0.023	0.1	PASS
38	12.08E-3	0.005	0.1	PASS
39	5.37E-3	0.002	0.1	PASS
40	2.60E-3	0.001	0.1	PASS

Power and THD results - DS: 1

True power P:	66.15W	Apparent power S:	71.01VA
Reactiv power Q:	25.8var	Power factor:	0.932
THD (U):	0.001	THD (I):	0.093
Crest Factor (U):	1.414	Crest Factor (I):	1.447

No partial calculation (average odd harmonics [21..39] < 100%)

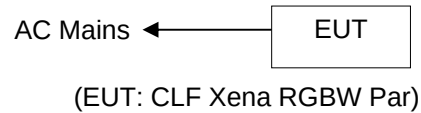




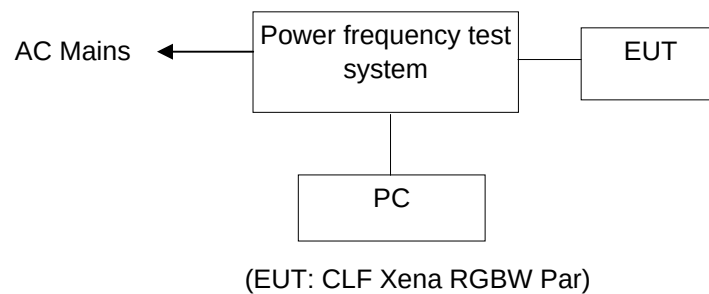
8. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

8.1 Block Diagram of Test Setup

8.1.1 Block diagram of connection between the EUT and simulators



8.1.2 Block Diagram of Test Setup



8.2 Measuring Standard

EN 61000-3-3: 2013

8.3 Operating Condition of EUT

- 8.3.1 Setup the EUT as shown in Section 8.1.
- 8.3.2 Turn on the power of all equipments.
- 8.3.3 Let the EUT work in test mode (ON) and measure it.

8.4 Test Results

PASS.

Please refer to the following page.

Test Report

Report title:	Flicker
Company Name:	EMTEK
Date of test:	13:41 8.May 2017
Tester:	Alan He
Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Flickermeter:	230V / 50Hz
Flicker Impedance:	Zref (IEC 60725)
Customer:	CLF LIGHTING B.V.
E. U. T.:	CLF Xena RGBW Par
M/N	CLF Xena RGBW Par
MODE	ON

Test Result	PASS
-------------	------

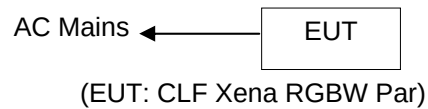
Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.005	3.30	PASS
dmax [%]	0.277	7.00	PASS
dt [s]	0.000	0.50	PASS

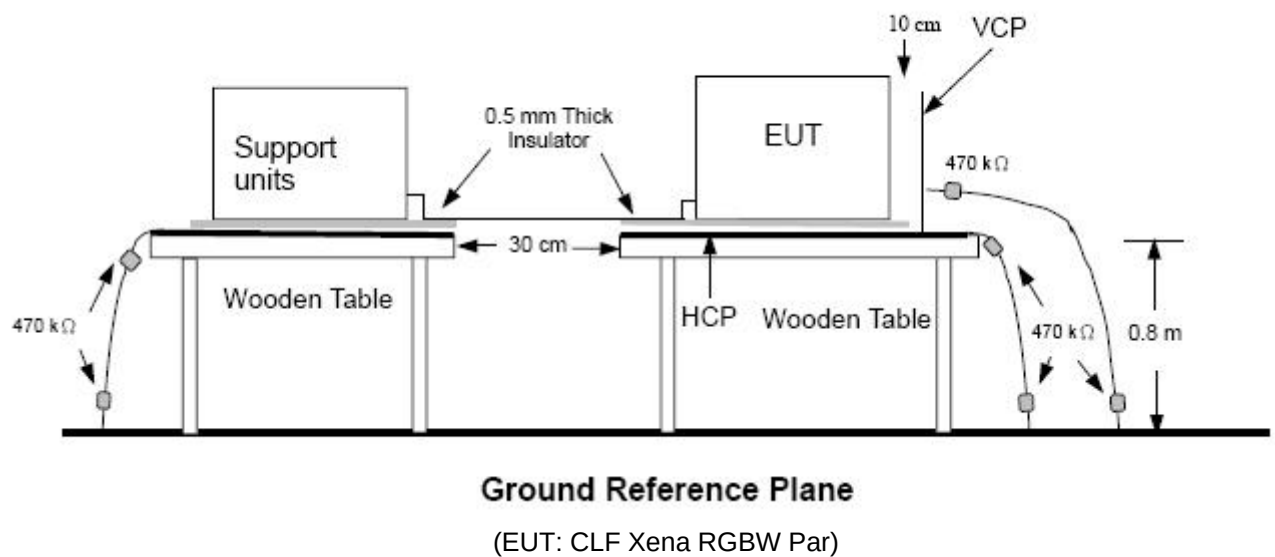
9. ELECTROSTATIC DISCHARGE TEST

9.1 Block Diagram of Test Setup

9.1.1 Block Diagram of the EUT



9.1.2 Block Diagram of ESD Test Setup



9.2 Test Standard

EN 61547: 2009
(IEC 61000-4-2: 2008,
Severity Level: Air Discharge: Level 3, $\pm 8\text{KV}$ Contact Discharge: Level 2, $\pm 4\text{KV}$)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

9.3.2 Performance criterion: **B**

9.4 EUT Configuration

The configuration of EUT is listed in Section 4.3.

9.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 9.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (ON) and measure it.

9.6 Test Procedure

9.6.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

9.6.2 Contact Discharge:

All the procedure shall be same as Section 9.6.1 except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.6.3 Indirect discharge for horizontal coupling plane:

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

9.6.4 Indirect discharge for vertical coupling plane:

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.7 Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

EMTEK(DONGGUAN) CO., LTD.

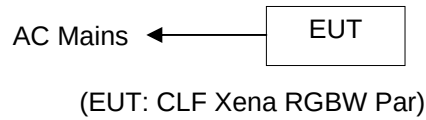
Applicant : CLF LIGHTING B.V.	Test Date : May 08, 2017	
EUT : CLF Xena RGBW Par	Temperature : 24°C	
M/N : CLF Xena RGBW Par	Humidity : 54%	
Power Supply : AC 230V/50Hz	Test Engineer: YF	
Test Mode : ON	Criterion : B	
Air Discharge: ±2, 4, 8KV		
Contact Discharge: ±2, 4KV # For each point positive 10 times and negative 10 times		
Location	Kind A-Air Discharge C-Contact Discharge	Result
Slot of EUT 10 points	A	PASS
Metal 10 points	C	PASS
HCP	C	PASS
VCP	C	PASS
Remark :	Test Equipment : ESD Tester (TESEQ AG, NSG437)	

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

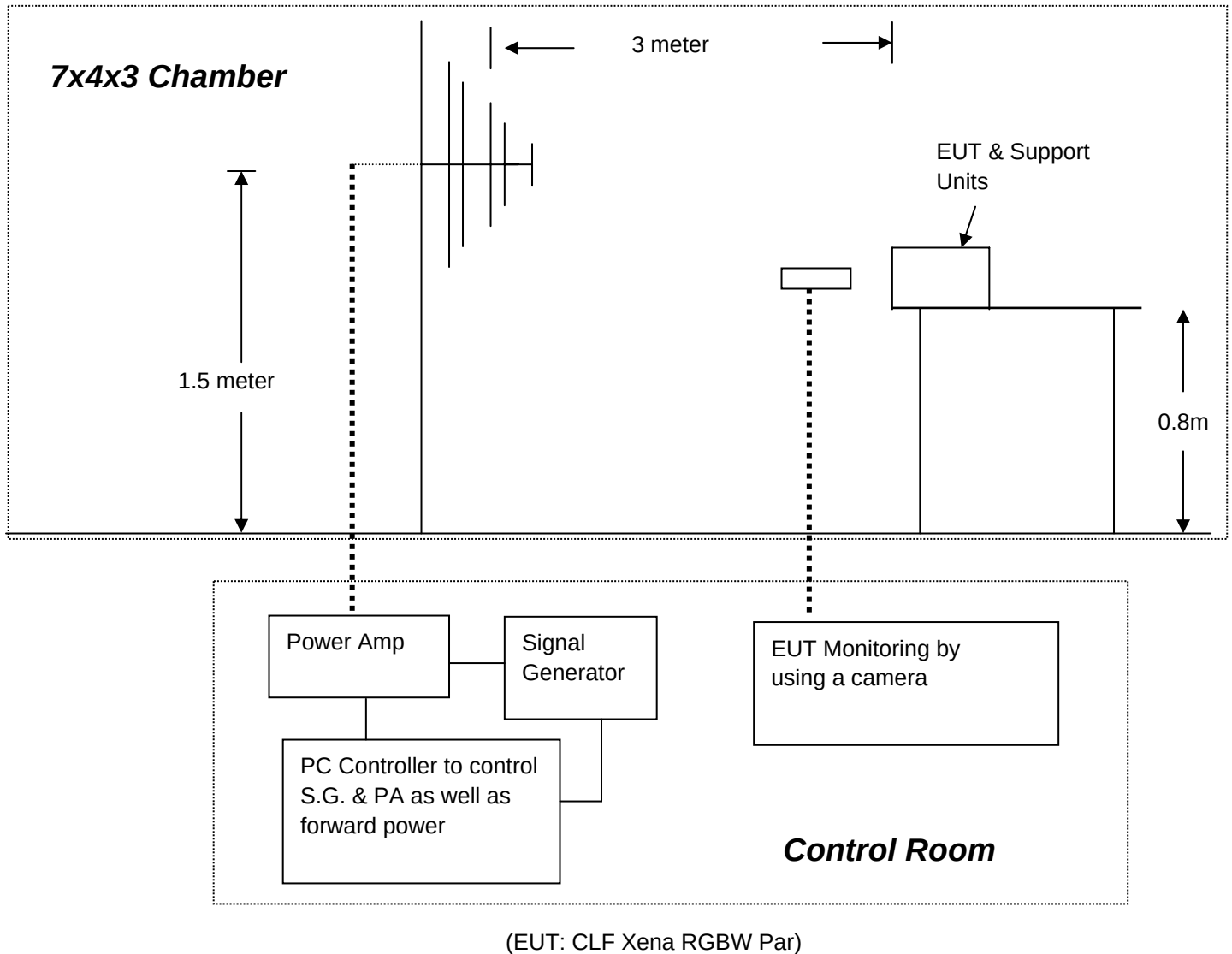
10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1 Block Diagram of Test Setup

10.1.1 Block Diagram of the EUT and the simulators



10.1.2 R/S Test Setup



10.2 Test Standard

EN 61547: 2009

(IEC 61000-4-3: 2006+A1: 2007+A2: 2010, Severity Level: 2, 3V / m)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

10.3.2 Performance criterion: **A**

10.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

10.5 Operating Condition of EUT

10.5.1 Setup the EUT as shown in Section 10.1.

10.5.2 Turn on the power of all equipments.

10.5.3 Let the EUT work in test mode (ON) and measure it.

10.6 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows:

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	1 Sec.

10.7 Test Results

PASS.

These test result outsourced to EMTEK(SHENZHEN) CO., LTD

Please refer to the following page.

RF Field Strength Susceptibility Test Results

EMTEK(SHENZHEN) CO., LTD

Applicant: CLF LIGHTING B.V.

Test Date : May 10, 2017

EUT : CLF Xena RGBW Par

Temperature : 22°C

M/N : CLF Xena RGBW Par

Humidity : 52%

Field Strength: 3 V/m

Criterion: A

Power Supply: AC 230V/50Hz

Frequency Range: 80 MHz to 1000 MHz

Test Engineer: YF

Modulation: ☒ AM ☐ Pulse ☐ none 1 KHz 80%

Test Mode : ON

Frequency Range : 80-1000MHz

Steps

1 %

Horizontal

Vertical

Front

PASS

PASS

Right

PASS

PASS

Rear

PASS

PASS

Left

PASS

PASS

Test Equipment :

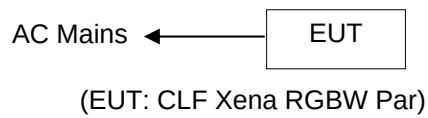
1. Signal Generator : 2023B (AEROFLEX)
2. Power Amplifier : AS0102-55 (MILMEGA)& AP32MT215 (PRANA)
3. Log.-Per. Antenna: VULP 9118E(SCHWARZBECK)
4. Broad-Band Horn Antenna: BBHA9120L3F (SCHWARZBECK)
5. RF Power Meter. Dual Channel : 4232A (BOONTON)
6. Field Strength Meter: HI-6005(HOLADAY)

Note:

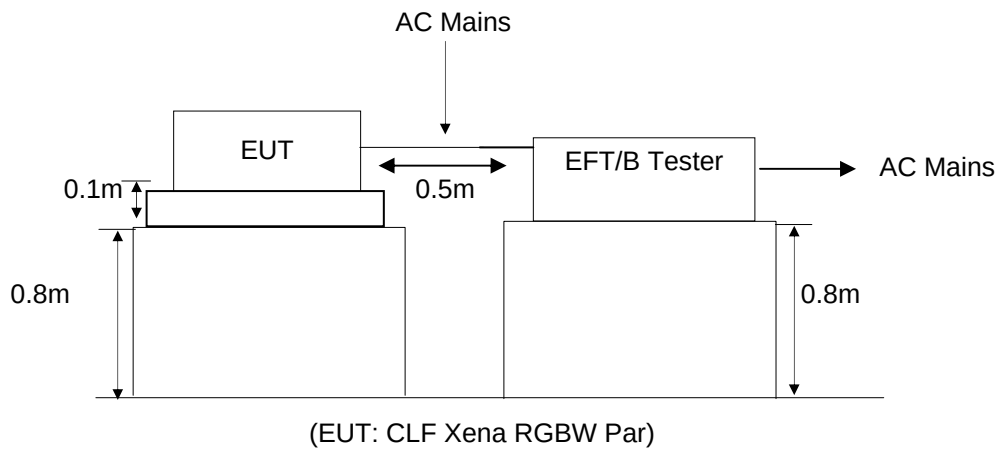
11. ELECTRICAL FAST TRANSIENT/BURST TEST

11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT and the simulators



11.1.2 Block Diagram of Test Setup



11.2 Test Standard

EN 61547: 2009
(IEC 61000-4-4: 2012, Severity Level, Level 2: 1KV)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5 KV	5 or 100	0.25 KV	5 or 100
2.	1 KV	5 or 100	0.5 KV	5 or 100
3.	2 KV	5 or 100	1 KV	5 or 100
4.	4 KV	5 or 100	2 KV	5 or 100
X	Special	Special	Special	Special
NOTE 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.				
NOTE 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.				
"X" is an open level. The level has to be specified in the dedicated equipment specification.				

11.3.2 Performance criterion: **B**

11.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.

11.5.2 Turn on the power of all equipments.

11.5.3 Let the EUT work in test mode (ON) and measure it.

11.6 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

11.6.1 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

11.6.2 For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

11.6.3 For DC output line ports:

No I/O ports. It's unnecessary to test.

11.7 Test Results

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

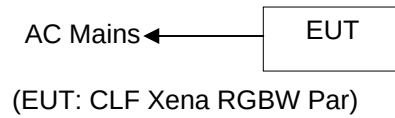
EMTEK(DONGGUAN) CO., LTD.

Standard :	☒ IEC 61000-4-4 ☐ EN 61000-4-4	Result : ☒ PASS / ☐ FAIL
Applicant : <u>CLF LIGHTING B.V.</u> EUT : <u>CLF Xena RGBW Par</u> M/N : <u>CLF Xena RGBW Par</u> Input Voltage: <u>AC 230V/50Hz</u> Criterion : <u>B</u> Ambient Condition : <u>24 °C</u> <u>54% RH</u>		
Operation Mode : ON		
Line : ☒ AC Mains	Line : ☐ Signal ☐ I/O Cable	
Coupling : ☒ Direct	Coupling : ☐ Capacitive	
Test Time : 120s		
Line	Test Voltage	Result (+) Result (-)
L	1KV	PASS PASS
N	1KV	PASS PASS
PE	1KV	PASS PASS
L 、 N	1KV	PASS PASS
L 、 PE	1KV	PASS PASS
N 、 PE	1KV	PASS PASS
L 、 N 、 PE	1KV	PASS PASS
Signal Line		
DC Line		
Note:		
Test Equipment	Burst Tester Model : UCS500M6B	

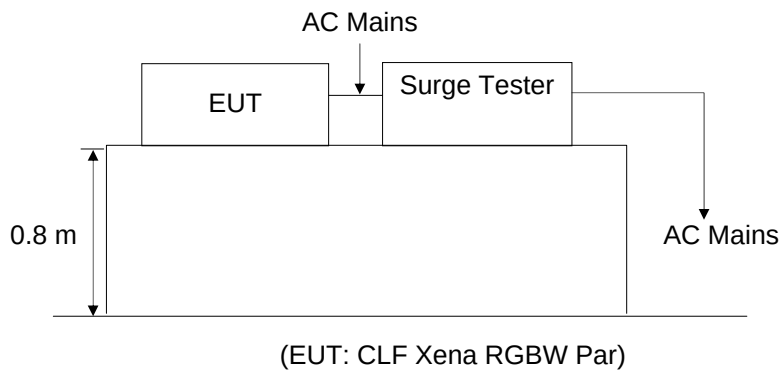
12. SURGE IMMUNITY TEST

12.1 Block Diagram of Test Setup

12.1.1 Block Diagram of the EUT



12.1.2 Surge Test Setup



12.2 Test Standard

EN 61547: 2009

(IEC 61000-4-5: 2014, Severity Level: Line to Line: Level 1, 0.5KV)

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

12.3.2 Performance criterion: **C**

12.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

12.5 Operating Condition of EUT

12.5.1 Setup the EUT as shown in Section 12.1.

12.5.2 Turn on the power of all equipments.

12.5.3 Let the EUT work in test mode (ON) and measure it.

12.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 12.1.2.
- 2) For line to line coupling mode, provide a 0.5 KV, 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

12.7 Test Results

PASS.

Please refer to the following page.

Surge Immunity Test Results

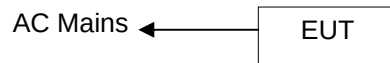
EMTEK(DONGGUAN) CO., LTD.

Applicant : <u>CLF LIGHTING B.V.</u> EUT : <u>CLF Xena RGBW Par</u> M/N : <u>CLF Xena RGBW Par</u> Power Supply : <u>AC 230V/50Hz</u> Test Mode : <u>ON</u>					Test Date : <u>May 08, 2017</u> Temperature : <u>22°C</u> Humidity : <u>50%</u> Test Engineer : <u>YF</u> Criterion : <u>C</u>
Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Result
L-N	+	90 ⁰	5	1.0	PASS
	-	270 ⁰	5	1.0	PASS
L-PE	+	90 ⁰	5	2.0	PASS
	-	270 ⁰	5	2.0	PASS
N-PE	+	90 ⁰	5	2.0	PASS
	-	270 ⁰	5	2.0	PASS
Remark:				Test Equipment : Surge Generator VCS 500M6T	

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

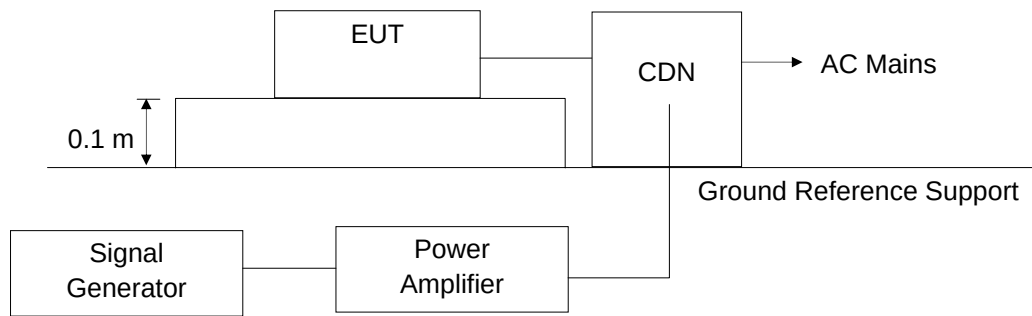
13.1 Block Diagram of Test Setup

13.1.1 Block Diagram of the EUT



(EUT: CLF Xena RGBW Par)

13.1.2 Block Diagram of Test Setup



(EUT: CLF Xena RGBW Par)

13.2 Test Standard

EN 61547: 2009

(IEC 61000-4-6: 2013, Severity Level 2: 3V (rms), 0.15MHz ~ 80MHz)

13.3 Severity Levels and Performance Criterion

13.3.1 Severity level

Level	Field Strength V
1.	1
2.	3
3.	10
X	Special

13.3.2 Performance criterion: **A**

13.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

13.5 Operating Condition of EUT

13.5.1 Setup the EUT as shown in Section 13.1.

13.5.2 Turn on the power of all equipments.

13.5.3 Let the EUT work in test mode (ON) and measure it.

13.6 Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 13.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

13.7 Test Results

PASS.

These test result outsourced to EMTEK(SHENZHEN) CO., LTD

Please refer to the following page.

Injected Currents Susceptibility Test Results

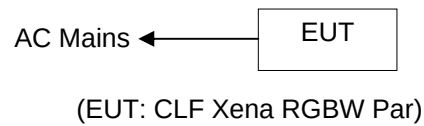
EMTEK(SHENZHEN) CO., LTD

Applicant : <u>CLF LIGHTING B.V.</u> EUT : <u>CLF Xena RGBW Par</u> M/N : <u>CLF Xena RGBW Par</u> Power Supply : <u>AC 230V/50Hz</u>			Test Date : <u>May 10, 2017</u> Temperature : <u>22°C</u> Humidity : <u>50%</u> Test Engineer : <u>YF</u>	
Test Mode : <u>ON</u>				
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
0.15 ~ 80	AC Mains	3V(rms)	A	PASS
Test Mode : <u>ON</u>				
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
Remark : 1. Modulation Signal:1KHz 80% AM Measurement Equipment : Simulator: CIT-10 (FRANKONIA) CDN : ☒ CDN-M2 (SWITZERLAND EM TEST) ☐ CDN-M3 (SWITZERLAND EM TEST)		Note:		

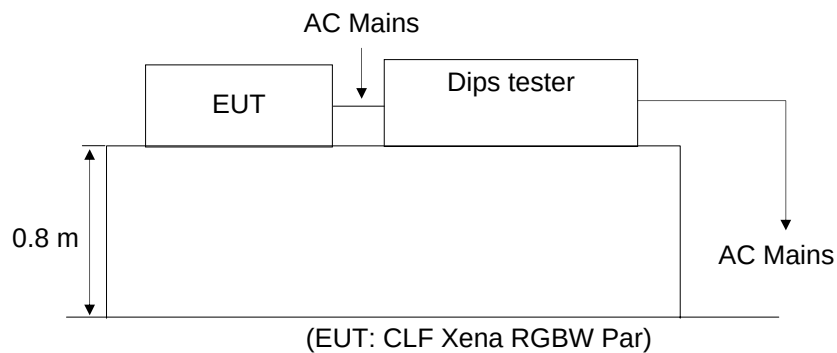
14. VOLTAGE DIPS AND INTERRUPTIONS TEST

14.1 Block Diagram of Test Setup

14.1.1 Block Diagram of the EUT



14.1.2 Dips Test Setup



14.2 Test Standard

EN 61547: 2009
(IEC 61000-4-11: 2004)

14.3 Severity Levels and Performance Criterion

14.3.1 Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5
40	60	1
70	30	5
		10
		25
		50
		*

14.3.2 Performance criterion: **B, C**

14.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

14.5 Operating Condition of EUT

14.5.1 Setup the EUT as shown in Section 14.1.

14.5.2 Turn on the power of all equipments.

14.5.3 Let the EUT work in test mode (ON) and measure it.

14.6 Test Procedure

Set up the EUT and test generator as shown on Section 15.1.2.

The interruption is introduced at selected phase angles with specified duration.

Record any degradation of performance.

14.7 Test Results

PASS.

These test result outsourced to EMTEK(SHENZHEN) CO., LTD

Please refer to the following page.

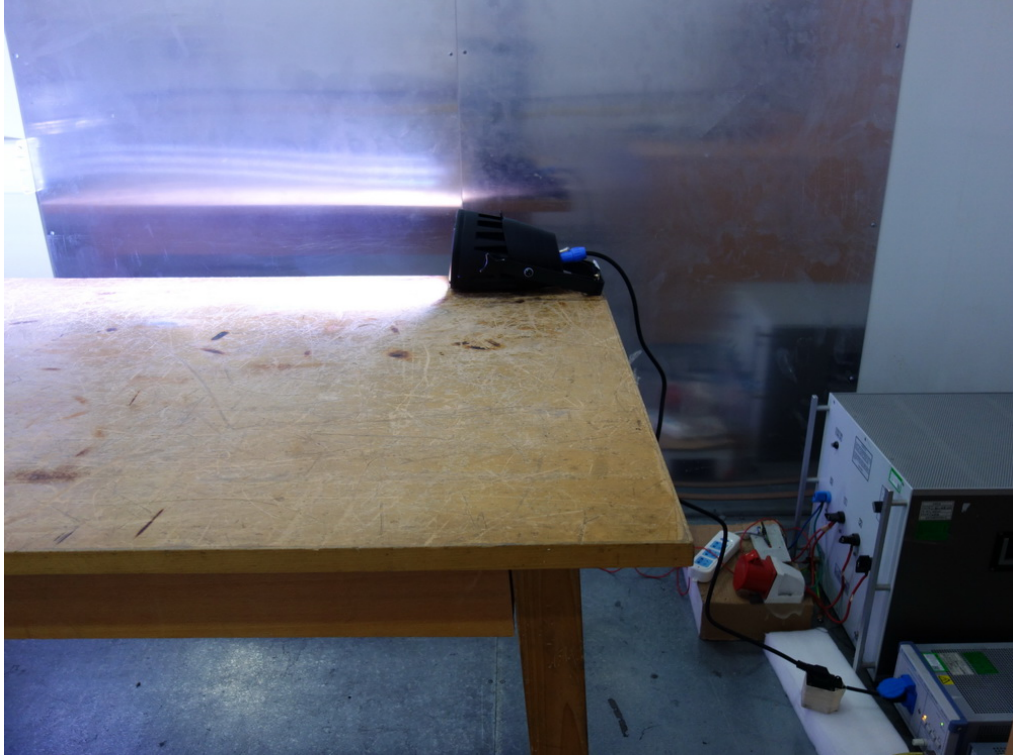
Voltage Dips And Interruptions Test Results

EMTEK(SHENZHEN) CO., LTD

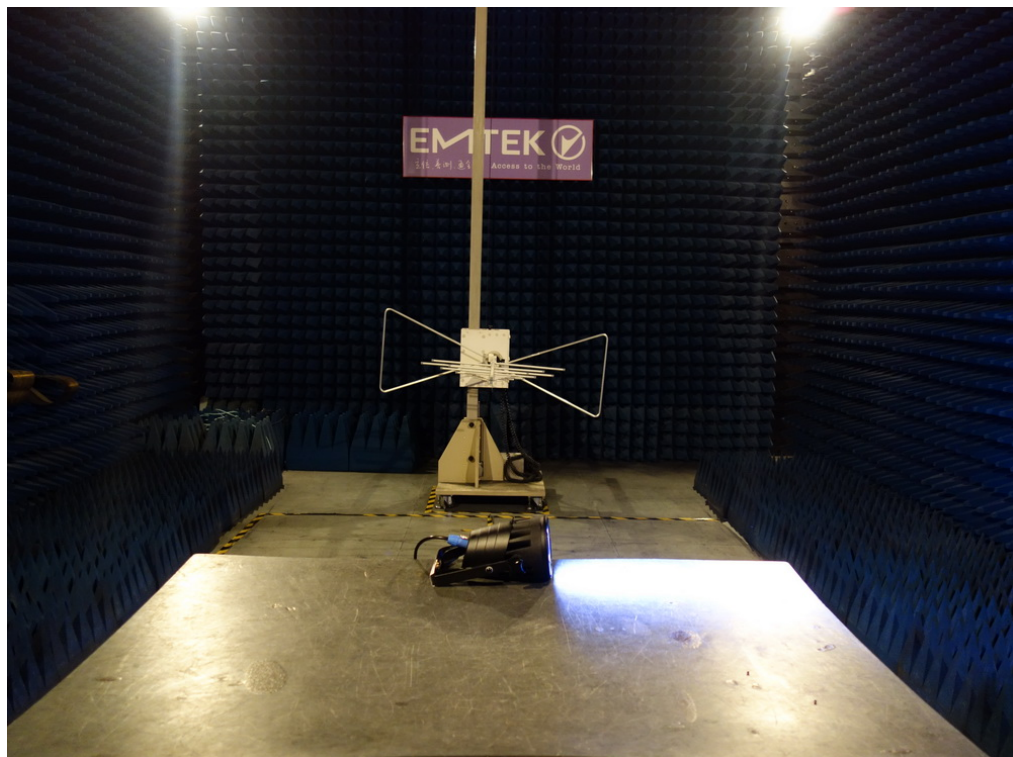
Applicant : <u>CLF LIGHTING B.V.</u> EUT : <u>CLF Xena RGBW Par</u> M/N : <u>CLF Xena RGBW Par</u> Power Supply : <u>AC 230V/50Hz</u>			Test Date : <u>May 10, 2017</u> Temperature : <u>22°C</u> Humidity : <u>50%</u> Test Engineer : <u>YF</u>	
Test Mode : <u>ON</u>				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Criterion ☐ A ☒ B ☒ C ☐ D	Result
70	30	10P	C	PASS
0	100	0.5P	B	PASS
Test Mode : ON				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Criterion ☐ A ☒ B ☒ C ☐ D	Result
Remark: U _T is the rated voltage for the equipment.			Test Equipment : 45KVA AC Power source (NSG 1007-45/45KVA)	

15. PHOTOGRAPH

15.1 Photo of Conducted Emission Measurement



15.2 Photo of Radiation Emission Measurement



15.3 Photo of Magnetic field emission Measurement



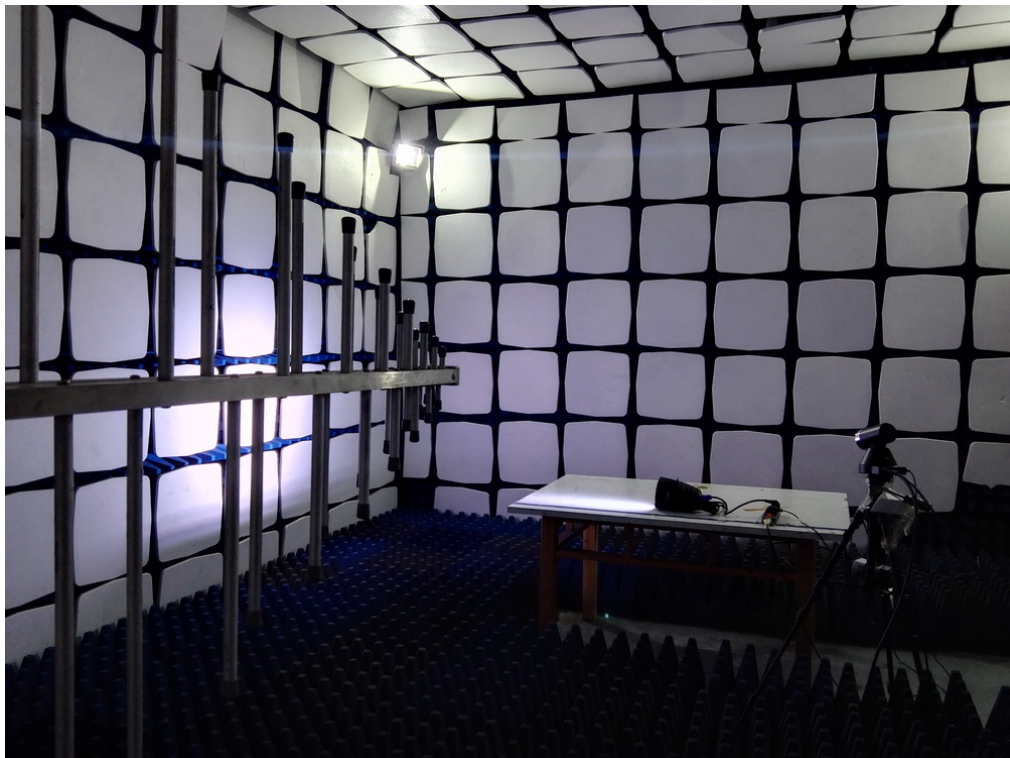
15.4 Photo of Harmonic / Flicker Measurement



15.5 Photo of Electrostatic Discharge Test



15.6 Photo of RF Field Strength susceptibility Test



15.7 Photo of Electrical Fast Transient /Burst Test



15.8 Photo of Surge Immunity Test



15.9 Photo of Injected Currents Susceptibility Test



15.10 Photo of Voltage Dips and Interruption Immunity Test



APPENDIX (Photos of EUT)



