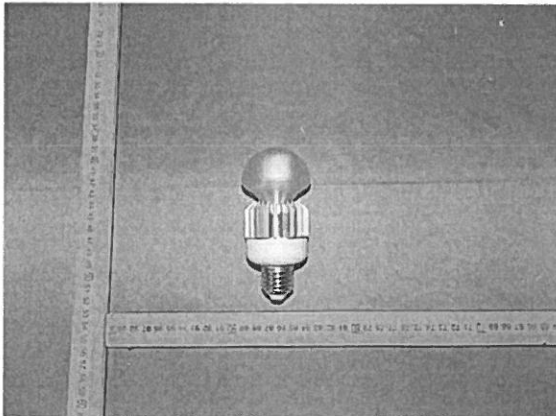

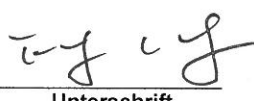


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Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	490642	Auftragsdatum: <i>Order date:</i>	17.07.2014	
Auftraggeber: <i>Client:</i>	Gembird Europe BV Wittevrouwen 56, 1358CD Almere Netherlands.			
Prügegenstand: <i>Test item:</i>	LED bulb light			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	Refer to page 2			
Auftrags-Inhalt: <i>Order content:</i>	TUV Rheinland – EMC Service			
Prüfgrundlage: <i>Test specification:</i>	EN 55015:2013 EN 61547:2009 EN 61000-3-3:2013 EN 61000-3-2:2006+A1+A2			
Wareneingangsdatum: <i>Date of receipt:</i>	24.07.2014			
Prüfmuster-Nr.: <i>Test sample No.:</i>	N/A			
Prüfzeitraum: <i>Testing period:</i>	24.07.2014-18.11.2014			
Ort der Prüfung: <i>Place of testing:</i>	Refer to section 1.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft/ tested by:		kontrolliert/ reviewed by:		
24.11.2014	Stone Hou/PE	24.11.2014	Feng Liang/TC	
<i>Datum</i> <i>Date</i>	<i>Name/Stellung</i> <i>Name/Position</i>	<i>Unterschrift</i> <i>Signature</i>	<i>Datum</i> <i>Date</i>	<i>Name/Stellung</i> <i>Name/Position</i>
				
Sonstiges/ Other:				
Refer to page 2 for detail information.				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
*Legende:	1= Sehr gut	2 = gut	3= befriedigend	4= ausreichend
	P(ass) =entspricht o.g. Prüfgrundlage(n)		F(ail)= entspricht o.g. Prüfgrundlage(n)	5 = mangelhaft
Legned:	1= very good	2 = good	3= satisfactory	4= sufficient
	P(ass) = passed a.m. test specification(s)		F(ail)= failed a.m. test specification(s)	N/A = nicht anwendbar
				N/T =nicht getestet
				5 = poor
				N/A = not applicable
				N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>				

Model List:

No	Model	Rated Voltage(V)	Rated Power(W)	Remark
1.	EG-LED0827-01	AC 100-240V, 50/60Hz	8W	Same PCB but different rated power
2.	EG-LED0840-01		8W	
3.	EG-LED1027-01		10W	
4.	EG-LED1040-01		10W	
5.	EG-LED1027-02		10W	
6.	EG-LED1040-02		10W	
7.	EG-LED1227-01		12W	Same PCB
8.	EG-LED1240-01		12W	

Other aspects:

In electrical characteristics, there are two types of PCB used in the above models. Considering the difference of the rated power and PCB, EMC tests were arranged as shown below.

Model	DV	RE	Har	3-loops	ESD	EFT	RS	CS	Surge	Dips
EG-LED1227-01	√	√		√	√	√	√	√	√	√
EG-LED1027-02	√	√		√	√	√	√	√	√	√

“√” means the test was performed.

TEST SUMMARY

4.1.1 HARMONICS ON AC MAINS

Result:

Pass

4.1.2 VOLTAGE FLUCTUATIONS ON AC MAINS

Result:

Pass

4.1.3 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE

Result:

Pass

4.1.4 RADIATED ELECTROMAGNETIC DISTURBANCE

Result:

Pass

4.2.1 RADIATED DISTURBANCE

Result:

Pass

5.1.1 ELECTROSTATIC DISCHARGE

Result:

Pass

5.1.2 RADIO FREQUENCY ELECTROMAGNETIC FIELD

Result:

Pass

5.2.1 FAST TRANSIENTS ON AC POWER LINES

Result:

Pass

5.2.2 INJECTED CURRENT INTO AC POWER PORT

Result:

Pass

5.2.3 SURGES TO AC POWER PORT

Result:

Pass

5.2.4 VOLTAGE DIPS AND INTERRUPTIONS TO AC POWER PORT

Result:

Pass

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1 Test Sites

1.1 Test Facilities

Laboratory A: WALTEK SERVICES (FO SHAN) CO., LTD.

**No.13-19, 2/F, 2nd Building, Sunlink International Machinery City,
Chencun Town, Shunde District, Foshan. 528313, Guangdong, China**

Laboratory B: Waltek Services (Shenzhen) Co., Ltd.

**1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan
District, Shenzhen, Guangdong, China**

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

The performed tests have been conducted under supervision of TÜV Rheinland/CCIC's engineer.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment of Laboratory A

No.	Equipment	Model	Serial No.	Cal. due date
1.	EMI Test Receiver	ESCI	101178	2015.01.10
2.	LISN	ENV216	101215	2015.01.10
3.	LISN	NSLK 8128	8128-289	2015.01.10
4.	Cable	CBL2-NN-3M	2230300	2015.01.10
5.	Switch	RSU/M2	---	2015.01.10
6.	Three Loops Antenna	HXYZ9170	213	2015.01.10
9	CDN	M016	31586	2015.01.10
10	ESD Simulator	NSG437	521	2015.01.10
11	EMS test system	NSG3040	0319	2015.01.10
12	Coupling Clamp	CDN8014	31405	2015.01.10
13	Step Transformer	INA6501	206	2015.01.10
14	Surge Simulator	NSG3060	1395	2015.01.10
15	Conducted Immunity test system	NSG4070-75	31469	2015.01.10
16	Clamp	KEMZ801	32362	2015.01.10

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Table 2: List of Test and Measurement Equipment of Laboratory B

1	SIGNAL GENERATOR	SMB100A-B106	105942	2015.09.20
2	RF Power Amplifier System	BLWA0830-160/100/40D	128740	2015.09.20
3	NRP2 Power Meter	NRP2	102031	2015.09.20
4	Gestockte Breitband(S tacked)Log-per. Antenna	STLP9128D	043	N/A

2 General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is an ordinary LED bulb light for Lighting and similar use. For the further information, refer to the user's manual.

2.2 Ratings and System Details

System input voltage	:	AC 100-240V	for all models
Frequency	:	50/60Hz	for all models
Rated output	:	Refer to page 2	

2.3 Independent Operation Modes

The basic operation modes are: "On" or "Off", without power regulation means.

Refer to the user manual for further information.

2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram for further information.

2.5 Submitted Documents

Circuit Diagram, BOM List, Construction drawings, etc.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

Immunity: The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

3.3 Test Operation and Test Software

Refer to the related paragraph of this report. No software was used.

3.4 Special Accessories and Auxiliary Equipment

None.

3.5 Countermeasures to achieve EMC Compliance

The tested sample contained noise suppression capacitor and inductors as described in the Circuit diagram. No special measure is employed to achieve the requirement.

4 Test Results EMISSION

4.1 Emission in the Frequency Range up to 30 MHz

4.1.1 Harmonics on AC Mains

Result:	Pass
----------------	-------------

Test procedure : EN 61000-3-2:2006+A1+A2
Harmonic order : 2 – 40th
Frequency range : 0 – 2kHz

According to the Clause 7.3 in the EN 61000-3-2:2006+A1+A2

Limits for Class C equipment

b) Active input power ≤ 25 W

- Discharge lighting equipment having an active input power smaller than or equal to 25 W shall comply with one of the following two sets of requirements:
- the harmonic currents shall not exceed the power-related limits of Table 3, column 2, or:
- the third harmonic current,

The maximum rated input of the samples is less than 25W and not belongs to Discharge lighting equipment, so the limits of harmonics on AC main are not applied to the samples.

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4.1.2 Voltage Fluctuations on AC Mains

Result:

Pass

Test procedure : EN 61000-3-3:2013
Limit : EN 61000-3-3:2013, Clause 5

According to the construction and characteristics of the EUT (low power), it does not produce voltage fluctuation, which will exceed the limits specified by the standard above. Therefore, the test is not necessary.

4.1.3 Mains Terminal Continuous Disturbance Voltage

Result:	Pass
----------------	-------------

Date of testing : 2014.10.31
 Kind of test site : Shielding Room
 Port : Mains
 Basic Standard : EN 55015:2013
 Frequency Range : 9kHz – 30MHz
 Limit : EN 55015:2013, Clause 4.3

Test Setup

Input Voltage : AC 100-240V, 50/60Hz
 Operational mode : ON
 Earthing : No (As Class II equipment)
 Ambient Temp. : 23 °C
 Test Setup : According to Clause 8 of EN 55015:2013

The measurement setup was made according to EN 55015:2013 in a shielding room.

The measurement equipment like test receiver, quasi-peak detector, Artificial Mains Network (AMN) and the conical metal housing are in compliance with CISPR 16-1 series standards and EN 55015:2013. The tested object was operated under its rated voltage and its rated frequency.

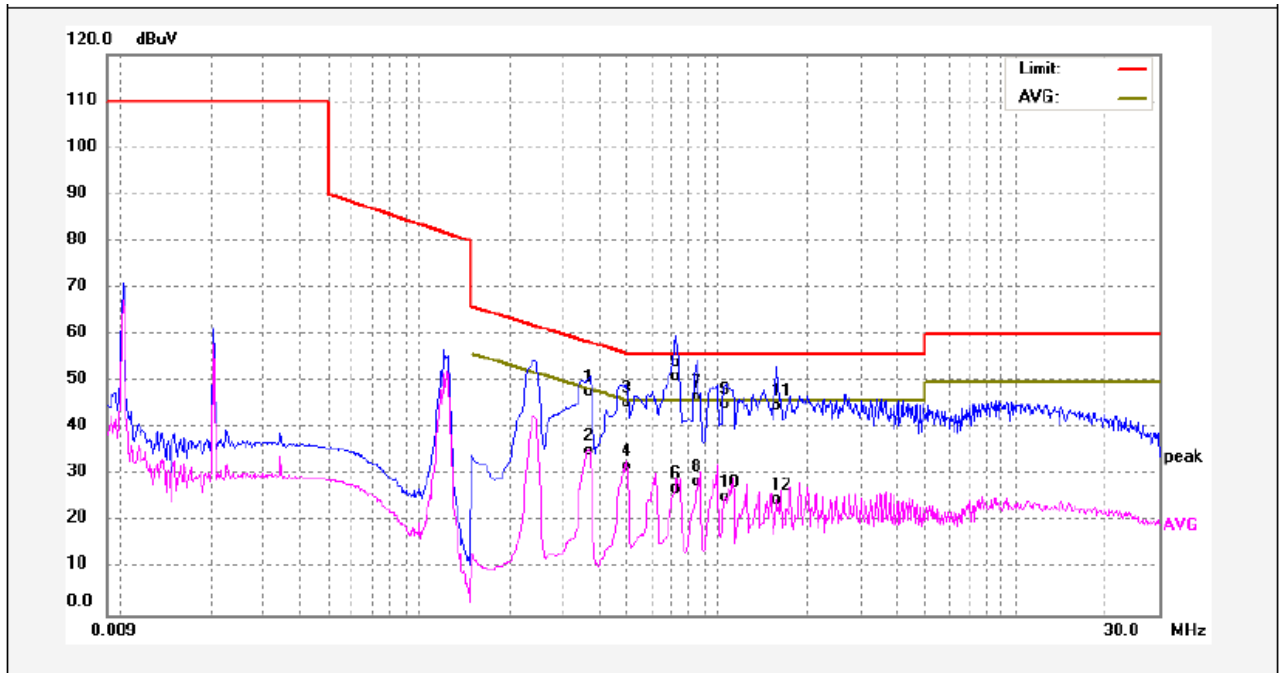
Furthermore an internal calibration with the test receiver was conducted prior to and after each measurement.

The tested object was set-up on a wooden table. The length of the power cord of the tested object was about 0.8m. The EUT was set 0.8m away from the AMN.

Each tested lamp was operated for at least 30min before test.

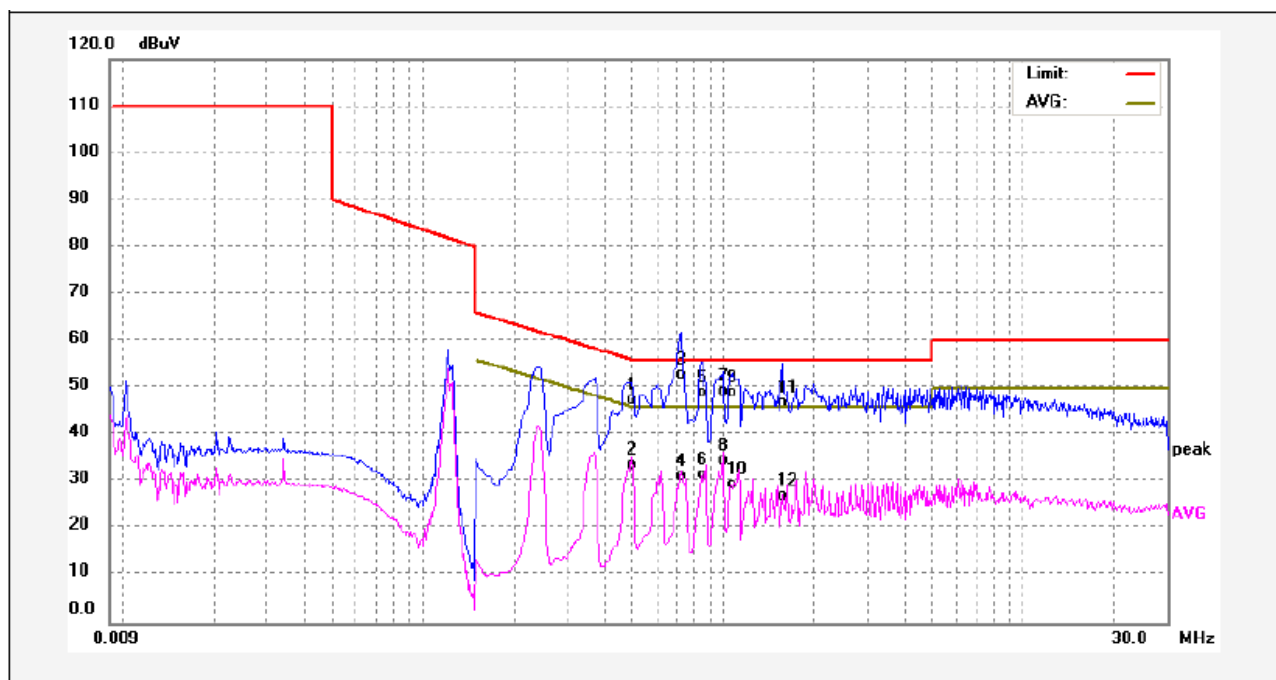
The Disturbance Voltage was determined according to clause 8 of EN 55015:2013 while measuring the line and neutral conductor by turns.

The following figures and tables were those measured by an automatic measuring system. Both Quasi Peak and Average Value were measured. Quasi-Peak and Average Value were measured and listed respectively where they had a maximum in previous scanning survey. In the Figures, “o” means Quasi-Peak Value and Average Value which were measured in final measurement.

Figure 1: Spectral Diagrams of disturbance voltage, 0.009-30MHz, L, for model EG-LED1227-01


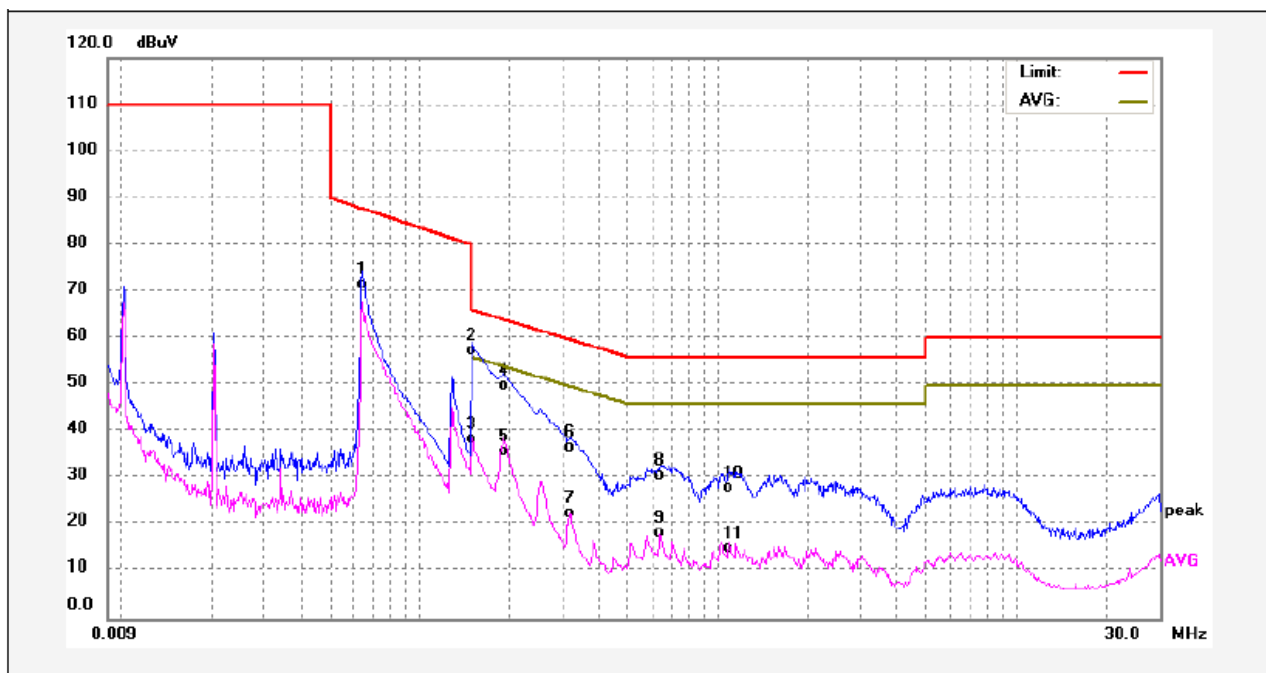
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3741	38.05	9.74	47.79	58.41	-10.62	QP	
2	0.3741	25.53	9.74	35.27	48.41	-13.14	AVG	
3	0.4981	35.68	9.78	45.46	56.03	-10.57	QP	
4	0.4981	22.03	9.78	31.81	46.03	-14.22	AVG	
5	0.7221	41.46	9.74	51.20	56.00	-4.80	QP	
6	0.7221	17.28	9.74	27.02	46.00	-18.98	AVG	
7	0.8501	36.91	9.71	46.62	56.00	-9.38	QP	
8	0.8501	19.09	9.71	28.80	46.00	-17.20	AVG	
9	1.0621	35.50	9.67	45.17	56.00	-10.83	QP	
10	1.0621	15.60	9.67	25.27	46.00	-20.73	AVG	
11	1.5781	35.14	9.65	44.79	56.00	-11.21	QP	
12	1.5781	15.07	9.65	24.72	46.00	-21.28	AVG	

Figure 2: Spectral Diagrams of disturbance voltage, 0.009-30MHz, for model EG-LED1227-01



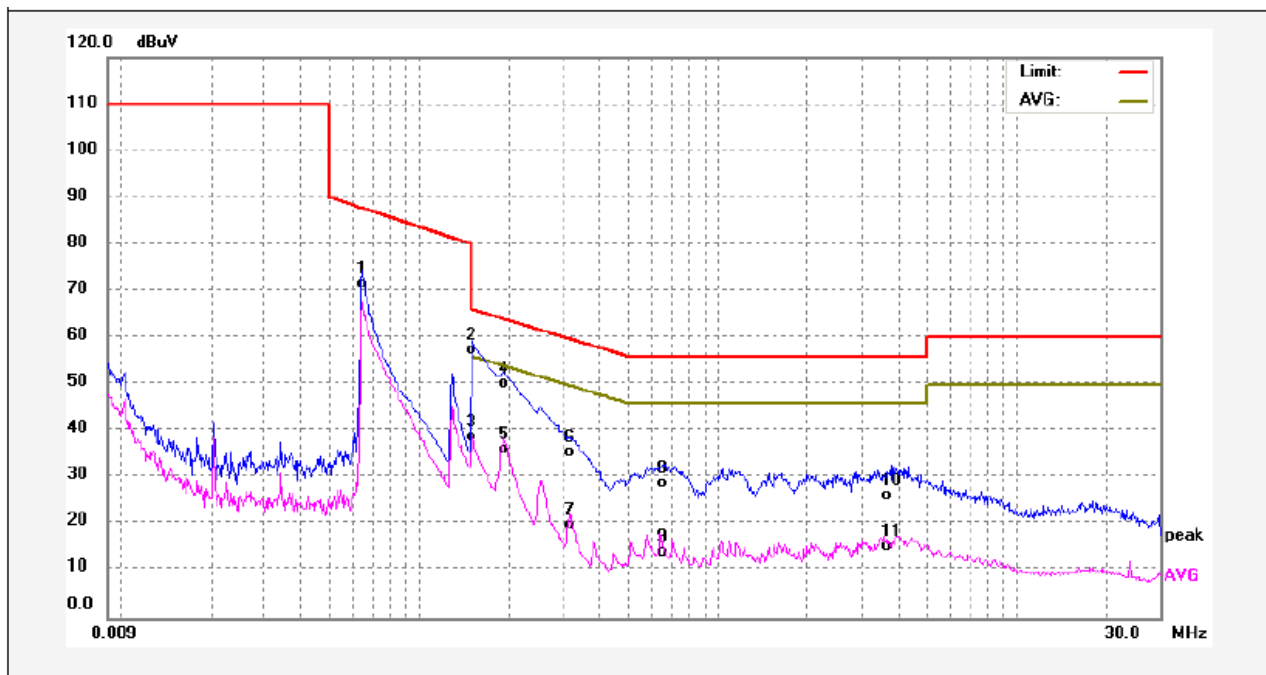
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.4981	37.72	9.77	47.49	56.03	-8.54	QP	
2	0.4981	24.03	9.77	33.80	46.03	-12.23	AVG	
3	0.7221	43.24	9.75	52.99	56.00	-3.01	QP	
4	0.7221	21.57	9.75	31.32	46.00	-14.68	AVG	
5	0.8461	39.23	9.71	48.94	56.00	-7.06	QP	
6	0.8461	21.98	9.71	31.69	46.00	-14.31	AVG	
7	1.0021	39.54	9.67	49.21	56.00	-6.79	QP	
8	1.0021	25.00	9.67	34.67	46.00	-11.33	AVG	
9	1.0621	39.26	9.67	48.93	56.00	-7.07	QP	
10	1.0621	19.81	9.67	29.48	46.00	-16.52	AVG	
11	1.5701	37.20	9.66	46.86	56.00	-9.14	QP	
12	1.5701	17.50	9.66	27.16	46.00	-18.84	AVG	

Figure 3: Spectral Diagrams of disturbance voltage, 0.009-30MHz, L, for model EG-LED1027-02



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.0644	61.63	9.83	71.46	87.69	-16.23	QP	
2	0.1500	47.62	9.70	57.32	65.99	-8.67	QP	
3	0.1500	28.93	9.70	38.63	55.99	-17.36	AVG	
4	0.1901	40.34	9.69	50.03	64.03	-14.00	QP	
5	0.1901	26.29	9.69	35.98	54.03	-18.05	AVG	
6	0.3221	26.87	9.73	36.60	59.65	-23.05	QP	
7	0.3221	12.90	9.73	22.63	49.65	-27.02	AVG	
8	0.6421	21.12	9.76	30.88	56.00	-25.12	QP	
9	0.6421	8.56	9.76	18.32	46.00	-27.68	AVG	
10	1.0861	18.35	9.67	28.02	56.00	-27.98	QP	
11	1.0861	5.53	9.67	15.20	46.00	-30.80	AVG	

Figure 4: Spectral Diagrams of disturbance voltage, 0.009-30MHz, for model EG-LED1027-02



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.0644	61.65	9.79	71.44	87.69	-16.25	QP	
2	0.1500	47.64	9.84	57.48	65.99	-8.51	QP	
3	0.1500	28.92	9.84	38.76	55.99	-17.23	AVG	
4	0.1901	40.41	9.76	50.17	64.03	-13.86	QP	
5	0.1901	26.27	9.76	36.03	54.03	-18.00	AVG	
6	0.3181	25.72	9.75	35.47	59.75	-24.28	QP	
7	0.3181	10.22	9.75	19.97	49.75	-29.78	AVG	
8	0.6660	19.15	9.76	28.91	56.00	-27.09	QP	
9	0.6660	4.50	9.76	14.26	46.00	-31.74	AVG	
10	3.7861	16.71	9.66	26.37	56.00	-29.63	QP	
11	3.7861	5.93	9.66	15.59	46.00	-30.41	AVG	

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4.1.4 Radiated Electromagnetic Disturbance

Result:

Pass

Date of testing : 2014.10.31
Port : Enclosure
Basic standard : EN 55015:2013
Frequency range : 9kHz – 30MHz
Limit : EN 55015:2013, clause 4.4

Test Setup

Operational Mode : ON
Earthing : No (As Class II equipment)
Test Site : EMC chamber

Measuring configuration and description

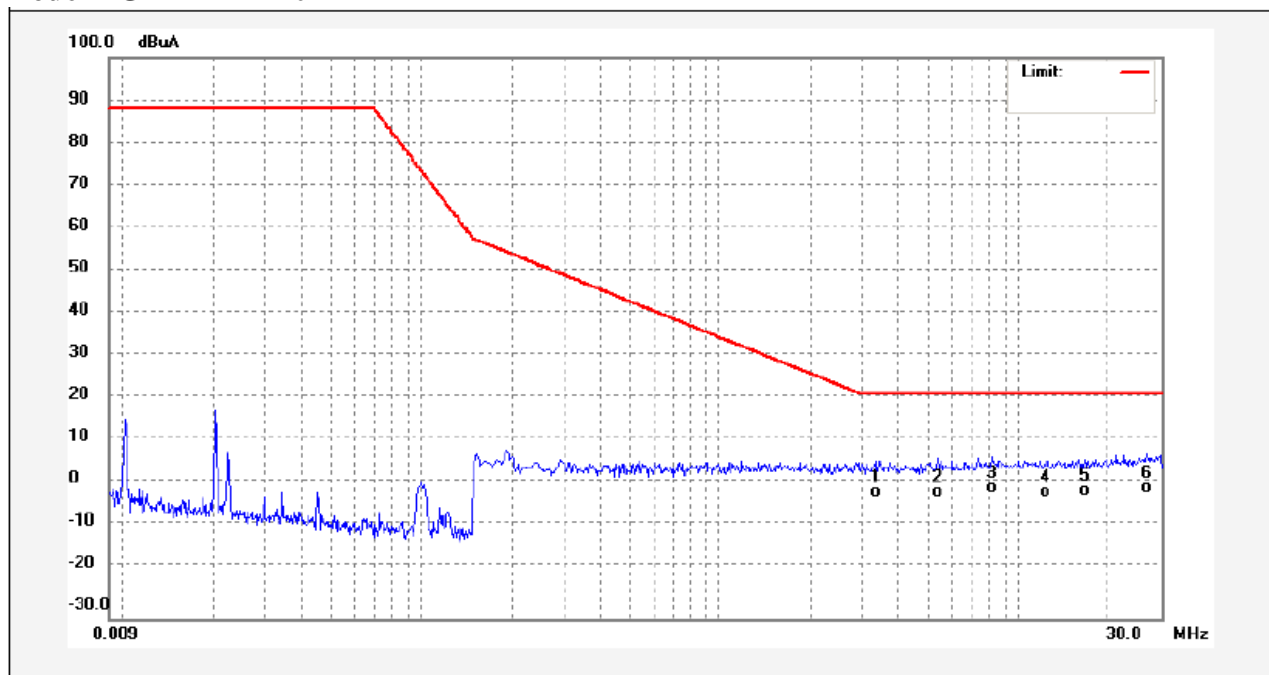
The measurement equipment like test received, loop antenna and coaxial switch are in compliance with the CISPR 16-1 series standards. The test setup was made according to Clause 9 of EN 55015:2013.

The EUT operated in ON model and at its rated voltage. The EUT is put on a wooden table in the center of the loop antenna. Before a measurement the EUT was operated for about 20 min.

Induced current in the loop antenna was measured by means of a current probe (1V/A) according to clause 9 of EN 55015:2013. The three field components were measured in sequence by means of a coaxial switch (loop antenna controller).

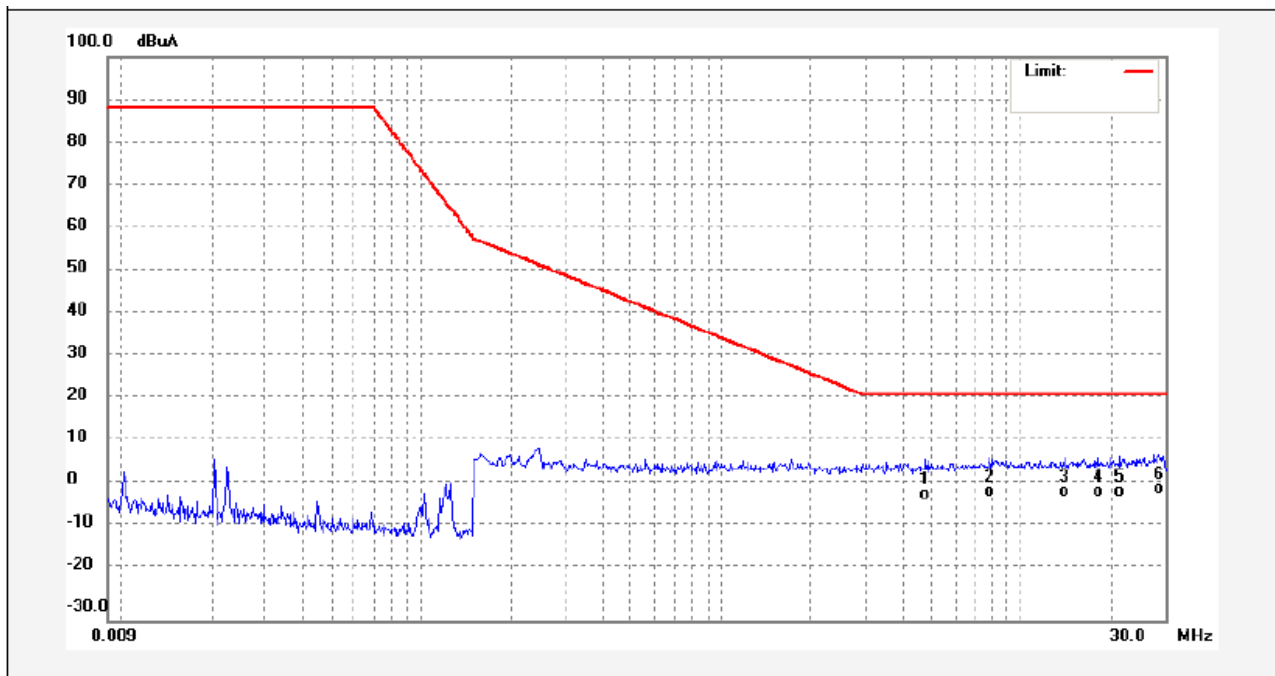
The following figures were those measured.

Figure 5: Graphic description of radiated electromagnetic disturbances, X direction, for model EG-LED1227-01



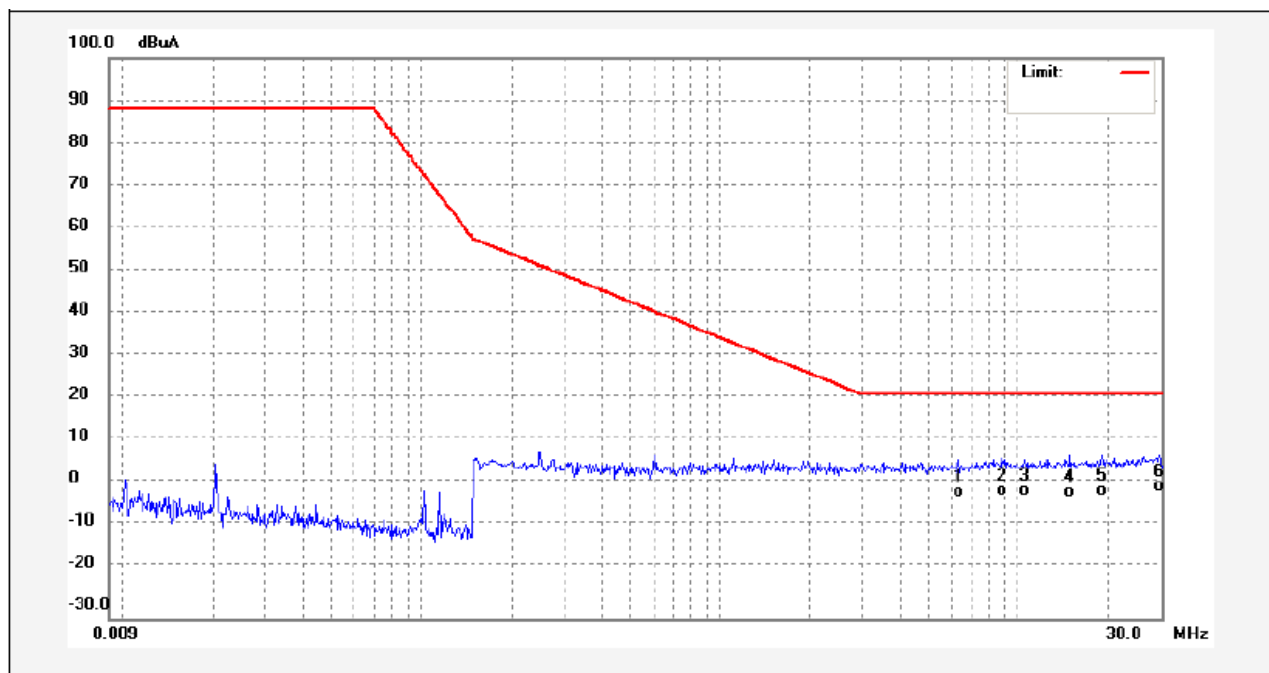
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.3261	-34.44	34.00	-0.44	22.00	-22.44	QP	
2	5.3341	-34.63	34.00	-0.63	22.00	-22.63	QP	
3	8.1301	-33.75	34.03	0.28	22.00	-21.72	QP	
4	12.3381	-34.59	34.09	-0.50	22.00	-22.50	QP	
5	16.6621	-34.45	34.19	-0.26	22.00	-22.26	QP	
6	26.7861	-34.07	34.42	0.35	22.00	-21.65	QP	

Figure 6: Graphic description of radiated electromagnetic disturbances, Y direction, for model EG-LED1227-01



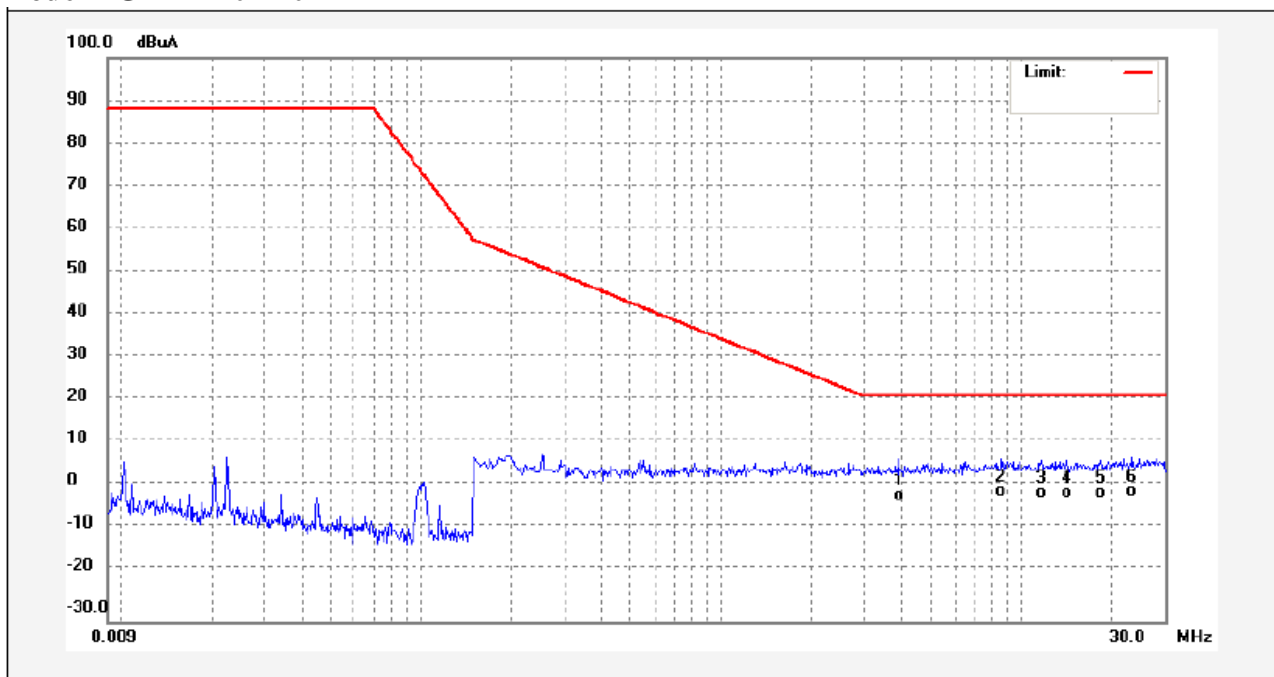
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	4.7741	-34.75	34.00	-0.75	22.00	-22.75	QP	
2	7.8061	-34.30	34.02	-0.28	22.00	-22.28	QP	
3	13.8181	-34.45	34.11	-0.34	22.00	-22.34	QP	
4	17.9381	-34.42	34.21	-0.21	22.00	-22.21	QP	
5	21.2061	-34.49	34.26	-0.23	22.00	-22.23	QP	
6	28.6861	-33.93	34.38	0.45	22.00	-21.55	QP	

Figure 7: Graphic description of radiated electromagnetic disturbances, Z direction, for model EG-LED1227-01



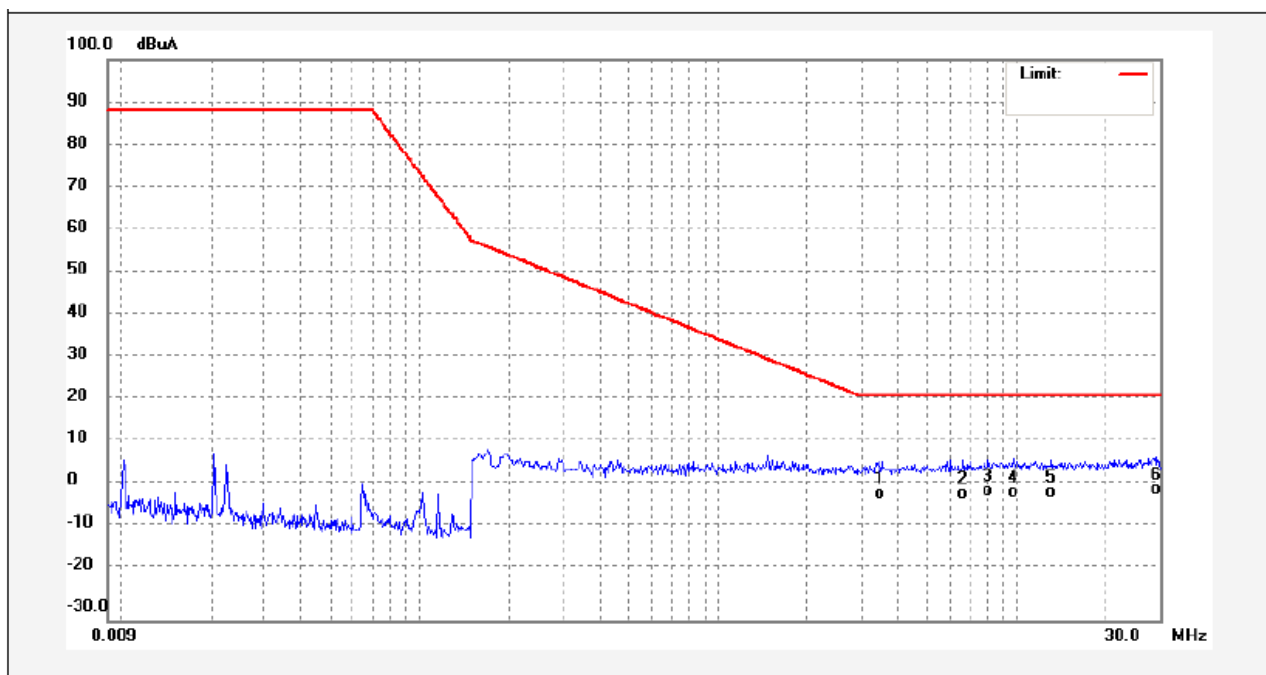
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	6.2781	-34.66	34.00	-0.66	22.00	-22.66	QP	
2	8.7621	-34.17	34.05	-0.12	22.00	-22.12	QP	
3	10.4541	-34.38	34.08	-0.30	22.00	-22.30	QP	
4	14.8501	-34.59	34.13	-0.46	22.00	-22.46	QP	
5	19.0101	-34.39	34.23	-0.16	22.00	-22.16	QP	
6	29.6661	-33.71	34.35	0.64	22.00	-21.36	QP	

Figure 8: Graphic description of radiated electromagnetic disturbances, X direction, for model EG-LED1027-02



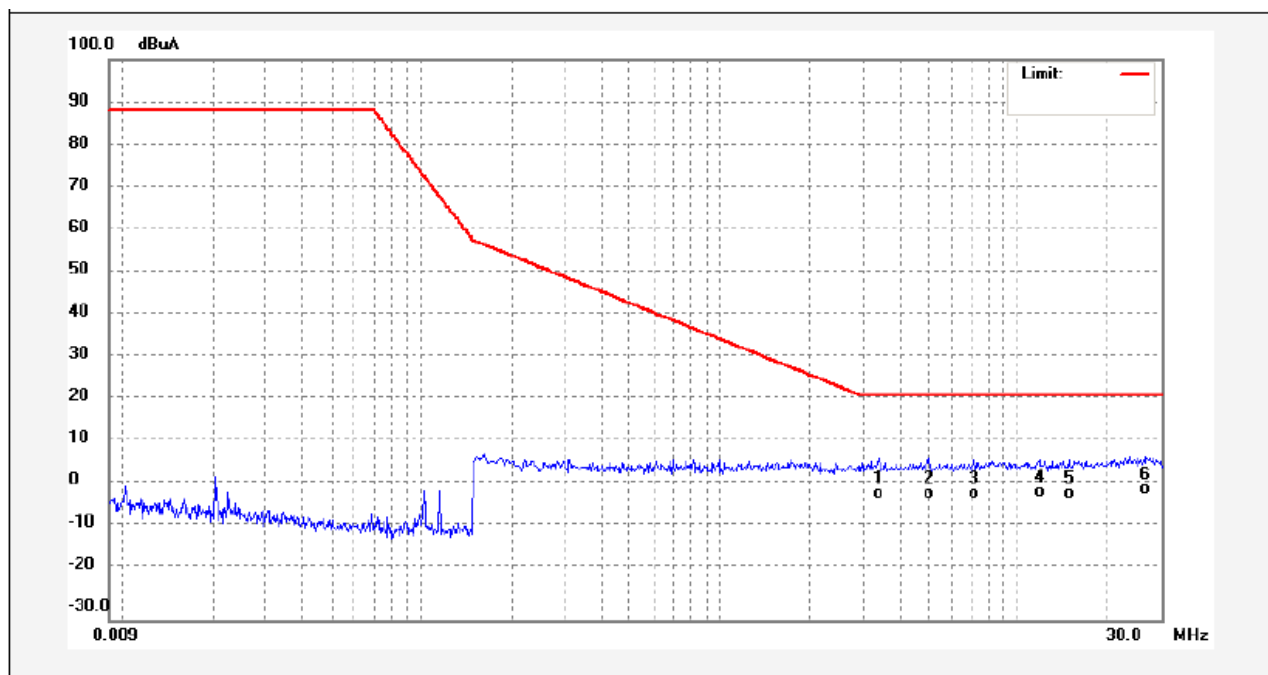
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.8941	-34.88	34.00	-0.88	22.00	-22.88	QP	
2	8.5901	-34.09	34.04	-0.05	22.00	-22.05	QP	
3	11.6741	-34.39	34.09	-0.30	22.00	-22.30	QP	
4	14.1141	-34.45	34.12	-0.33	22.00	-22.33	QP	
5	18.3021	-34.60	34.22	-0.38	22.00	-22.38	QP	
6	23.4981	-34.33	34.29	-0.04	22.00	-22.04	QP	

Figure 9: Graphic description of radiated electromagnetic disturbances, Y direction, for model EG-LED1027-02



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.4701	-34.58	34.00	-0.58	22.00	-22.58	QP	
2	6.6181	-34.58	34.00	-0.58	22.00	-22.58	QP	
3	8.0021	-33.94	34.03	0.09	22.00	-21.91	QP	
4	9.7141	-34.34	34.07	-0.27	22.00	-22.27	QP	
5	13.0461	-34.41	34.10	-0.31	22.00	-22.31	QP	
6	29.1541	-33.88	34.37	0.49	22.00	-21.51	QP	

Figure 10: Graphic description of radiated electromagnetic disturbances, Z direction, for model EG-LED1027-02



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.3861	-34.61	34.00	-0.61	22.00	-22.61	QP	
2	5.0021	-34.66	34.00	-0.66	22.00	-22.66	QP	
3	7.1341	-34.58	34.00	-0.58	22.00	-22.58	QP	
4	11.7141	-34.46	34.09	-0.37	22.00	-22.37	QP	
5	14.7861	-34.68	34.13	-0.55	22.00	-22.55	QP	
6	26.7421	-34.10	34.42	0.32	22.00	-21.68	QP	

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4.2 Emission in the Frequency Range above 30 MHz

4.2.1 Radiated disturbance

Result:	Pass
Date of testing	: 2014.10.31
Test procedure	: EN 55015:2013 Annex B CDN method
Frequency range	: 30-300MHz
Kind of test site	: Shielding Room
Limit	: EN 55015:2013 Table B.1
	Quasi-peak limits: 30-100MHz, 64-54dB μ V; 100-230MHz, 54 dB μ V; 230-300MHz, 61dB μ V

Test Setup

Input voltage	: AC 100-240V, 50/60Hz
Operational mode	: ON
Temperature	: 23°C
Relative humidity	: 50%

Measuring configuration and description

If the EUT complies with the requirements of Annex B of EN55015:2006+A1+A2, it is deemed to comply with the radiated disturbances requirements in the frequency range 30MHz to 300MHz specified in 4.4.2 of EN55015:2006+A1+A2.

The Conducted RF emission test was measured in the frequency range from 30MHz to 300MHz according to EN 55015:2013. The measurement was performed in accordance with the method specified in Annex B of EN 55015:2013.

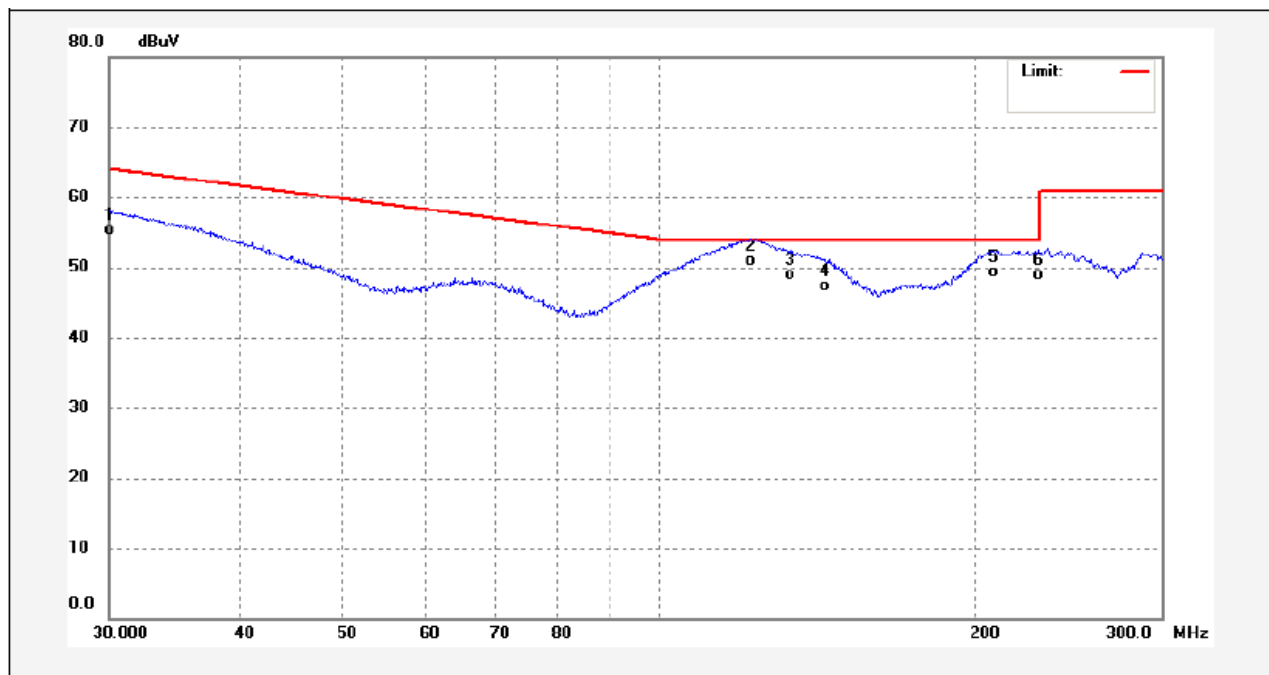
The Conducted RF emission test was performed in a shielding room with a CDN FCC-801-M2/M3-16A. The EUT is placed on one non-conducting block with a height of (10 \pm 0.2) cm which in turn are placed on an earthed metal plate with dimensions at least 20 cm larger than the lighting equipment.

The EUT is connected via a mains supply cable with a length of (20 \pm 10) cm to the CDN. The distance of the cable to the metal plate should be (4 \pm 1) cm. The CDN is mounted on the metal plate.

Each tested lamp was operated for at least 30min before test.

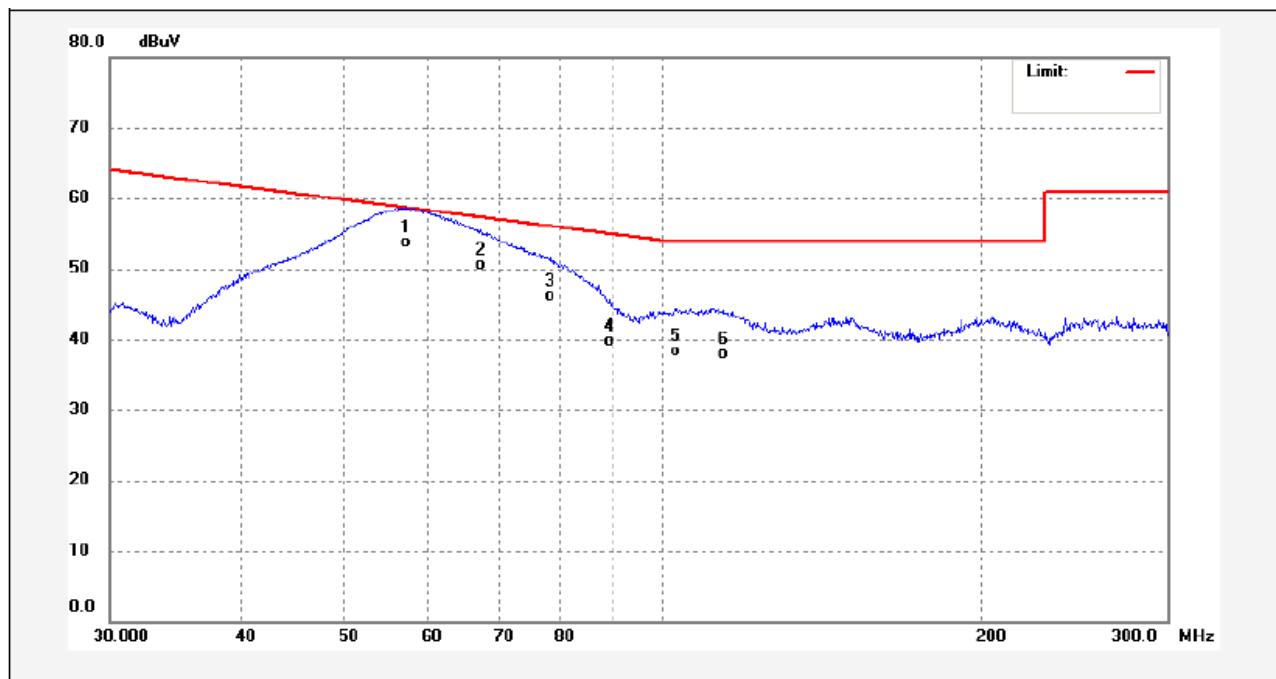
The following figures were those measured and recorded by a test receiver. The curves in the figure were those measured with a Peak detector. "o" refers to Quasi-peak value which were measured in the final measurement.

Figure 11: Spectral Diagrams, RF Emission, for model EG-LED1227-01



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	30.0000	38.62	16.64	55.26	64.00	-8.74	QP	
2	122.4600	34.09	16.73	50.82	54.00	-3.18	QP	
3	133.3200	32.20	16.70	48.90	54.00	-5.10	QP	
4	144.0600	30.66	16.68	47.34	54.00	-6.66	QP	
5	207.7200	32.05	17.21	49.26	54.00	-4.74	QP	
6	229.2600	32.02	16.90	48.92	54.00	-5.08	QP	

Figure 12: Spectral Diagrams, RF Emission, for model EG-LED1027-02



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	57.1800	36.56	17.14	53.70	58.64	-4.94	QP	
2	67.4400	33.42	16.99	50.41	57.27	-6.86	QP	
3	78.4200	29.02	17.11	46.13	56.02	-9.89	QP	
4	89.2800	22.72	17.00	39.72	54.94	-15.22	QP	
5	103.0199	21.44	16.86	38.30	54.00	-15.70	QP	
6	114.2400	21.09	16.85	37.94	54.00	-16.06	QP	

5 Test Results I M M U N I T Y

During the immunity tests, the EUT was operated under conditions specified by clause 3.1 of this report.

Performance criterion A: During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Performance criterion B: During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.

Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands.

Performance criterion C: During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.

The EMC immunity performances of the EUT were tested according to EN 61547:2009.

Testing date: 2014.11.03

Room temperature: 23.5-24.6 °C

Relative Humidity: 48-49%

5.1 Enclosure

5.1.1 Electrostatic Discharge

Result:	Pass
----------------	-------------

The immunity against electrostatic discharge was tested in accordance EN 61547:2009. Test setup and ESD-Generator are according to IEC 61000-4-2 which is specified under EN 61547:2009. The EUT was placed on an insulation lining of 0.5mm thick. Between the insulation lining and the wooden table, there was a horizontal coupling plane (HCP) of 1.6×0.8m. The simple luminaries and its power supply cord were isolated from the HCP by the insulating lining.

Charge voltage	±4.0kV (Conducted Discharge) ±8.0kV (Air Discharge)
Polarity	positive / negative
Number of discharges	>10
Performance criteria	B

Table 3: ESD, Positive / Negative Polarity

Position	Kind of Discharge	Remarks	Result
Enclosure	Air discharge ±8kV	No change of luminous intensity	Pass
Coupling plane (Both HCP and VCP)	Conducted discharge ±4kV	No change of luminous intensity	Pass

5.1.2 Radio Frequency Electromagnetic Field

Result:	Pass
----------------	-------------

The immunity against radio-frequency electromagnetic fields in the frequency range between 80MHz and 1000MHz was tested in accordance to IEC 61000-4-3 which is specified by clause 5.3 in EN 61547:2009.

The test was performed inside a 3m modified semi-anechoic chamber. During the test the part of the ground plane between the field generating antenna and the equipment under test was covered by absorbing material. The distance between the tip of the antenna and the side of the system tested is 3m. The field uniformity of the 1.5mx1.5m plane where the surface of the EUT tested coincides with is regularly calibrated to ensure the 0-6dB field uniformity criterion as specified by IEC 61000-4-3 is met.

Test Level : 3V/m
 Frequency Range : 80-1000MHz
 Modulation : 80% AM, 1kHz
 Frequency Sweep Speed : 1% step size
 Dwell Time : 3s
 Performance Criteria : A

Table 4: Radiated Susceptibility, Field Strength 3V/m

Position	Result	Remarks
Antenna in vertical orientation	Pass	No change of luminous intensity
Antenna in horizontal orientation	Pass	No change of luminous intensity

5.2 Input and Output AC Power Ports

5.2.1 Fast Transients on AC Power Lines

Result:	Pass
----------------	-------------

The immunity against fast transients on AC power lines was tested in accordance to EN 61000-4-4 which is specified by clause 5.5 in EN 61547:2009.

Test setup and the fast transient noise generator was according to IEC 61000-4-4 which is specified by EN 61547:2009. The lamp was placed on a wooden table 0.1m above the reference ground plane of aluminum and was insulated from it by an insulating support 0.1m thick. The cable length of the EUT was 2.0m.

Test Voltage	: 1kV
Polarity	: negative/positive
Repetition frequency	: 5kHz
Test duration	: ≥120sec
Tr/Tn	: 5ns/50ns
Severity level	: 2
Performance criteria	: B

Table 5: Burst, AC Power lines, Positive/Negative Polarity

Position	Observation	Result
AC Input L1	No change of luminous intensity	Pass
AC Input L2	No change of luminous intensity	Pass

5.2.2 Injected Current into AC Power Port

Result:	Pass
----------------	-------------

The immunity against injected current into AC power port was tested according to EN 61547:2009 in a shielded room.

The Test setup and the test generator was according to IEC 61000-4-6 which is specified by EN 61547:2009. The simple luminaire was placed on a small wooden support 0.1m above a reference ground plane which is of aluminum. The cable length of the EUT was about 0.5m. The EUT comprised a single unit. The coupling and decoupling networks was inserted on the power supply connection. The coupling and decoupling networks was placed on the ground reference plane, making direct contact with it at about 0.1 – 0.3 meter from the EUT. The height of cable between the EUT and the coupling and decoupling networks above the ground reference plane was 50mm.

Voltage Level	: 3V(rms)(unmodulated)
Environmental phenomena	: r.f. current, common mode, 1kHz, 80% AM
Source impedance	: 150 Ω
Frequency range	: 0.15 – 80 MHz
Sweeping rate	: $\leq 1,5 \times 10^{-3}$ decades/s/ ≥ 2 sec.
Performance criteria	: A

Table 6: Injected current, AC Power lines

Line	Observation	Result
AC Input port	No change of luminous intensity	Pass

5.2.3 Surges to AC Power Port

Result:

Pass

The immunity against surges to AC power port was tested in accordance to EN 61000-4-5 which is specified by clause 5.7 in EN 61547:2009.

Test setup and the Combination Wave Generator (CWG) was according to IEC 61000-4-5. The decoupling network is incorporated in the CWG. Both the EUT and CWG were placed on an insulation table. The cable length between the EUT and the CWG was about 1.5m.

Test Level : line to line 0.5kV
(Open-circuit Test Voltage)
Tr/Tn : 1.2/50µs (open-circuit voltage)
8/20µs (short-circuit current)
Test numbers : 5 positive and 5 negative pulses at both phases of 0 and $\pi/2$
Repetition rate : 1/min
Performance criteria : C

Table 7: Surges to AC Power lines, positive/negative

Line	Tested Voltage/coupling phase	Observation	Result
Phase to neutral	+0.5kV, $+\pi/2$ (5 times)	No change of luminous intensity	Pass
	-0.5kV, $-\pi/2$ (5 times)	No change of luminous intensity	Pass

5.2.4 Voltage dips and interruptions to AC Power Port

Result:	Pass
----------------	-------------

The immunity against voltage dips and interruptions to AC power port was tested in accordance to EN 61000-4-11 which is specified by clause 5.8 in EN 61547:2009.

Test setup and the test generator was according to IEC 61000-4-11. Both the EUT and the generator were placed on table 0.8m above reference ground.

Table 8: Test condition and Test result for Voltage Dips

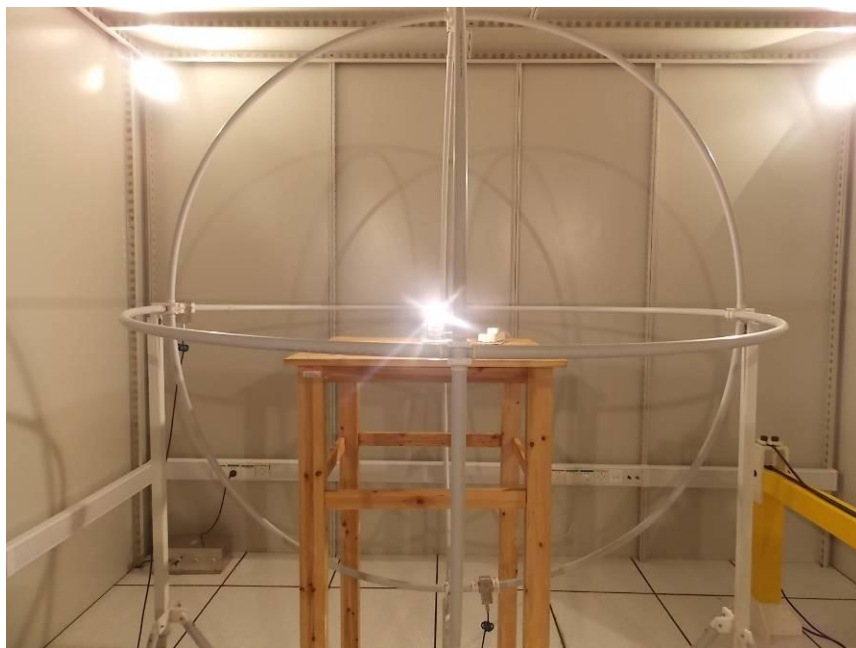
Environmental Phenomena	Test level (in % UT)	Duration (in period of the rated frequency)	Performance criteria	Result
Interruptions	0	0,5 (10ms)	B	Pass
Voltage dips (in % UT) 30	70	10 (200ms)	C	Pass

6 Photographs of the Test Set-Up

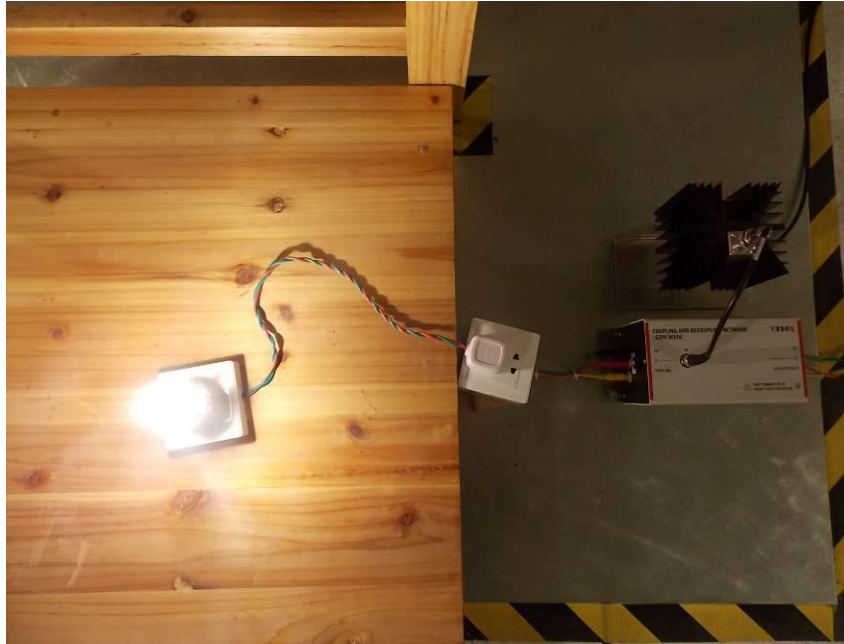
Photograph 1: Set-up for Mains Conducted Emission



Photograph 2: Set-up for Radiated Electromagnetic Emission



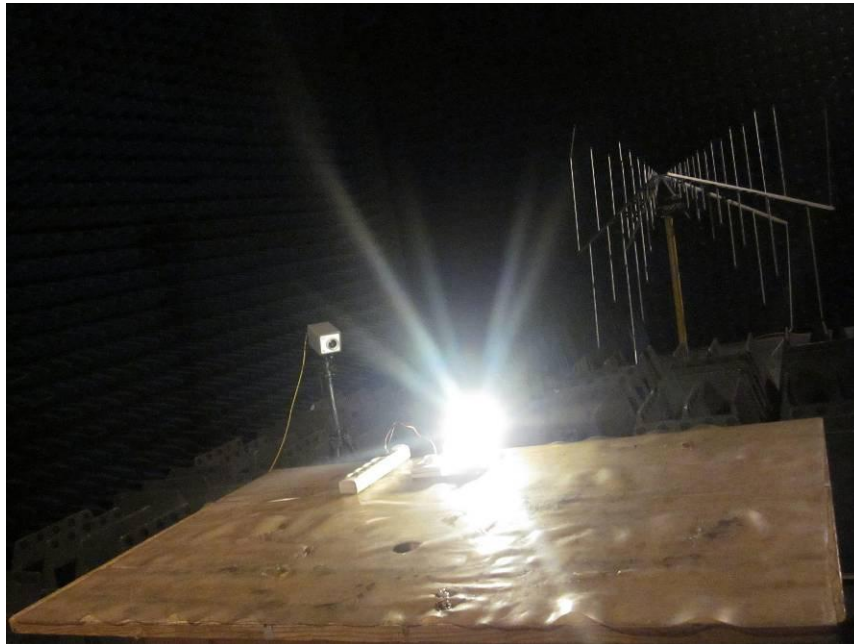
Photograph 3: Set-up for Radiated Emission (CDN method)



Photograph 4: Set-up for Electrostatic Discharge



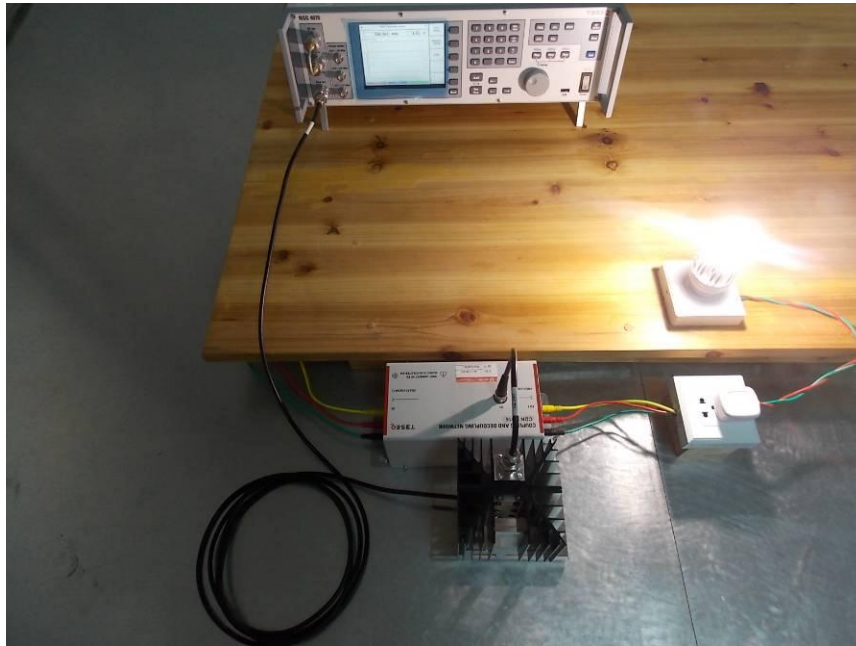
Photograph 5: Set-up for Radiated Susceptibility



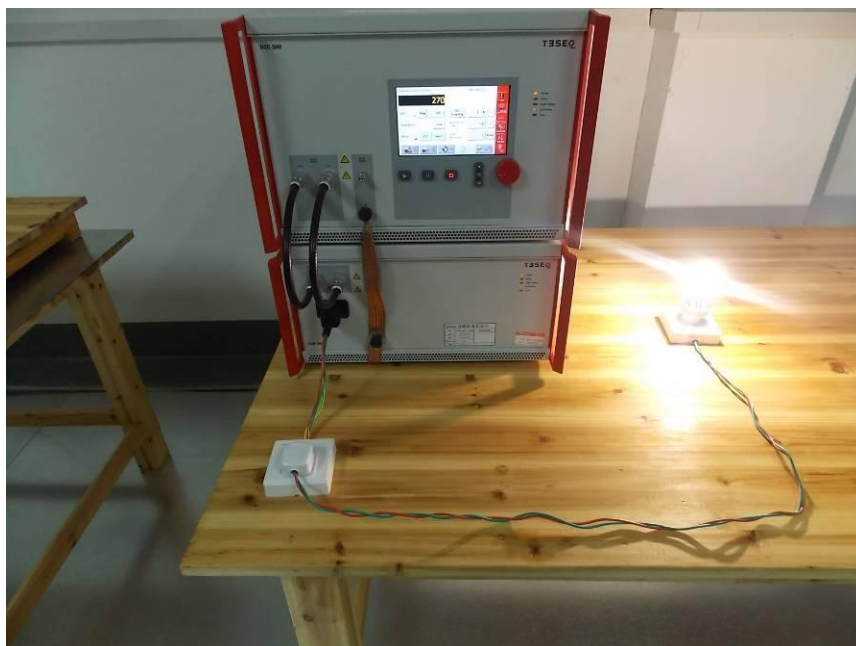
Photograph 6: Set-up for Fast Transient Burst & Voltage dips and interruptions to AC Power Port



Photograph 7: Set-up for Inject Current



Photograph 8: Set-up for Surges on AC Power Line



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