



# EMC TEST REPORT

For

JM Zengge Co.,Ltd

LED Ceiling Light

Test Model: ZJ-BWCLAH-RGBWW-R12C2

Additional Model No.: Please Refer to Page 8

Prepared for : JM Zengge Co.,Ltd  
Address : Room 01,03,04, 14th Floor, The Torch Building, No.288  
Jin'ou Road, Jiangmen City.

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.  
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Date of receipt of test sample : December 23, 2022  
Number of tested samples : 2  
Serial number : Prototype  
Date of Test : December 23, 2022 ~ December 29, 2022  
Date of Report : December 30, 2022





**EMC TEST REPORT**  
**EN IEC 55015:2019+A11:2020**

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

**EN 61547: 2009**

Equipment for general lighting purposes - EMC immunity requirements

**Report Reference No. .... : LCSA121222254EE**  
Date Of Issue..... : December 30, 2022

**Testing Laboratory Name.... : Shenzhen LCS Compliance Testing Laboratory Ltd.**  
Address..... : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China  
Testing Location/ Procedure.. : Full application of Harmonised standards   
Partial application of Harmonised standards   
Other standard testing method

**Applicant's Name..... : JM Zengge Co.,Ltd**  
Address..... : Room 01,03,04, 14th Floor, The Torch Building, No.288 Jin'ou Road, Jiangmen City.

**Test Specification:**  
Standard..... : EN IEC 55015:2019+A11:2020  
EN IEC 61000-3-2:2019/A1:2021  
EN 61000-3-3:2013/A2:2021  
EN 61547: 2009  
Test Report Form No..... : LCSEMC-1.0  
TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.  
Master TRF..... : Dated 2011-03

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**Test Item Description..... : LED Ceiling Light**  
Trade Mark..... : N/A  
Test Model ..... : ZJ-BWCLAH-RGBWW-R12C2  
Ratings..... : Input: AC 190-240V, 50/60Hz, 30W  
**Result ..... : Positive**

**Compiled by:**

**Supervised by:**

**Approved by:**

Diamond Lu/Administrator

Cary Luo/ Technique principal

Gavin Liang/ Manager





### EMC -- TEST REPORT

<b>Test Report No. : LCSA121222254EE</b>	<u>December 30, 2022</u> Date of issue
--	---

Test Model ..... : ZJ-BWCLAH-RGBWW-R12C2	
EUT..... : LED Ceiling Light	
<b>Applicant..... : JM Zengge Co.,Ltd</b>	
Address..... : Room 01,03,04, 14th Floor, The Torch Building, No.288 Jin'ou Road, Jiangmen City.	
Telephone..... : /	
Fax..... : /	
<b>Manufacturer..... : JM Zengge Co.,Ltd</b>	
Address..... : Room 01,03,04, 14th Floor, The Torch Building, No.288 Jin'ou Road, Jiangmen City.	
Telephone..... : /	
Fax..... : /	
<b>Factory..... : /</b>	
Address..... : /	
Telephone..... : /	
Fax..... : /	

**Test Result** according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.





### Revision History

Report Version	Issue Date	Revision Content	Revised By
000	December 30, 2022	Initial Issue	--



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## 1. SUMMARY OF STANDARDS AND RESULTS

### 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION (EN IEC 55015:2019+A11:2020)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN IEC 55015:2019+A11:2020	-----	PASS
Magnetic field emission	EN IEC 55015:2019+A11:2020	-----	PASS
Radiated disturbance	EN IEC 55015:2019+A11:2020	-----	PASS
Harmonic current emissions	EN IEC 61000-3-2:2019/A1:2021	Class C	PASS
Voltage fluctuations & flicker	EN 61000-3-3:2013/A2:2021	-----	PASS
IMMUNITY (EN 61547: 2009)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2	B	PASS
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5	B	PASS
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6	A	PASS
Power frequency magnetic field	EN 61000-4-8	A	PASS
Voltage dips, 30% reduction	EN IEC 61000-4-11	C	PASS
Voltage interruptions		B	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Normal operation	Record
***Note: All test modes were tested, but we only recorded the worst case in this report.		





## 1.2. Description of Performance Criteria

### General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.

### 1.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

### 1.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

### 1.2.3. Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be loss.



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## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT : LED Ceiling Light

Trade Mark : N/A

Test Model : ZJ-BWCLAH-RGBWW-R12C2

Additional Model No. : ZJ-BWCLAL-RGBWW-R12C2,  
ZJ-BWCLAL-RGBWW-R28A3,  
ZJ-BWCLAH-RGBWW-R28A3, ZJ-TMCLAL-RGBWW,  
ZJ-TMCLAH-RGBWW, ZJ-BWBL-RGBWW,  
ZJ-BWBH-RGBWW, ZJ-BWBL-RGBWW-24W,  
ZJ-BWBH-RGBWW-24W, ZJ-BWBL-RGBWW-R12C2,  
ZJ-BWBL-RGBWW-D328K, XG28ZJ-EU,  
ZJ-LXD-XG55, ZJ-LXD-XG68, ZJ-LXD-XG28-J,  
ZJ-LXD-XGP05-J, ZJ-BWCLBL-RGBWW,  
ZJ-BWCLBH-RGBWW, ZJ-BWCLBL-RGBWW-R12C2,  
ZJ-BWCLBH-RGBWW-R28A3

Model Declaration : PCB board, structure and internal of these model(s) are the same, So no additional models were tested

Power Supply : Input: AC 190-240V, 50/60Hz, 30W

EUT Clock : ≤108MHz







## 2.2. Description of Test Facility

### Site Description

EMC Lab. : NVLAP Accreditation Code is 600167-0.  
FCC Designation Number is CN5024.  
CAB identifier is CN0071.  
CNAS Registration Number is L4595.

## 2.3. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.





## 2.4.Measurement Uncertainty

Test Item	Parameters	Expanded uncertainty (Ulab)	Expanded uncertainty (Ucispr)
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	$\pm 2.63$ dB $\pm 2.35$ dB	$\pm 3.8$ dB $\pm 3.4$ dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	$\pm 3.60$ dB	$\pm 4.5$ dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	$\pm 3.68$ dB	$\pm 3.3$ dB
Radiated Emission	Level accuracy (30MHz to 1000MHz)	$\pm 3.48$ dB	N/A
Radiated Emission	Level accuracy (above 1000MHz)	$\pm 3.90$ dB	$\pm 5.3$ dB
Mains Harmonic	Voltage	$\pm 0.510\%$	$\pm 5.2$ dB
Voltage Fluctuations & Flicker	Voltage	$\pm 0.510\%$	N/A

- (1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.
- (2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of  $k=2$ , which for a normal distribution corresponds to a coverage probability of approximately 95%.





### 3. MEASURING DEVICES AND TEST EQUIPMENT

#### Test Item: Conducted Disturbance

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2022-02-16	2023-02-15
3	Artificial Mains	R&S	ENV216	101288	2022-06-16	2023-06-15
4	Pulse Limiter	R&S	ESH3-Z2	102750-NB	2022-08-19	2023-08-18
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2022-10-29	2023-10-28

#### Test Item: RADIATED ELECTROMAGNETIC DISTURBANCES

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Large Loop Antenna	LAPLACE	LLA-2	9161	2022-01-10	2025-01-09
2	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2022-06-16	2023-06-15
3	EMI Test Software	EZ	EZ-EMC	/	N/A	N/A
4	EMI Test Receiver	R&S	ESR3	102312	2022-02-16	2023-02-15

#### Test Item: Radiated Disturbance (Electric Field)

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	3m Full Anechoic Chamber	MRDIANZI	FAC-3M	MR009	2021-09-25	2024-09-24
3	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
6	EMI Test Receiver	R&S	ESPI	101940	2022-08-18	2023-08-17
7	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022-10-29	2023-10-28
9	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2022-10-29	2023-10-28

#### Test Item: Harmonic Current

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2022-02-08	2023-02-07
2	HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD1411124	2022-02-08	2023-02-07

#### Test Item: Voltage fluctuation and Flicker

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2022-02-08	2023-02-07
2	HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD1411124	2022-02-08	2023-02-07

#### Test Item: Electrostatic Discharge

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	SCHLODER	SESD 230	604035	2022-07-18	2023-07-17



**Test Item: RF Field Strength Susceptibility**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	RS Test Software	Tonscend	/	/	N/A	N/A
2	MXG Vector Signal Generator	Agilent	E4438C	MY42081396(6G)	2022-06-16	2023-06-15
3	3m Full Anechoic Chamber	MRDIANZI	FAC-3M	MR009	2021-09-25	2024-09-24
4	RF POWER AMPLIFIER	OPHIR	5225R	1052	2022-06-16	2023-06-15
5	RF POWER AMPLIFIER	OPHIR	5273F	1019	2022-06-16	2023-06-15
6	RF POWER AMPLIFIER	SKET	HAP_0306G-50W	/	2022-06-16	2023-06-15
7	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	NCR	NCR
8	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-482	NCR	NCR
9	RS Electric field probe	narda	EP 601	611WX80208	2022-06-16	2023-06-15

Note: NCR means no calibration requirement

**Test Item: Electrical Fast Transient/Burst**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2022-08-17	2023-08-16
2	Electric fast pulse group generator	3ctest	EFT-4001G	EC0461044	2022-10-31	2023-10-30
3	Capacitive coupling clamp	3CTEST	EFTC	EC0441098	2022-06-16	2023-06-15

**Test Item: Surge**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2022-08-17	2023-08-16
2	Communication wave lightning generator	HTEC	HTSG 70	181701	2022-10-31	2023-10-30
3	Symmetrical data line coupling network	HTEC	HCN 8	182701	2022-10-31	2023-10-30
4	Data line decoupling network	HTEC	HDEC 8	182702	2022-10-31	2023-10-30

**Test Item: Conducted Susceptibility**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2022-08-17	2023-08-16
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2022-06-16	2023-06-15
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2022-06-16	2023-06-15
4	Electromagnetic coupling injection clamp	ZHINAN	ZN23203	14017	2022-06-16	2023-06-15

**Test Item: Power Frequency Magnetic Field Susceptibility**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8K	906003	2022-06-16	2023-06-15

**Test Item: Voltage Dips**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2022-06-16	2023-06-15





**Test Item: Voltage Short Interruptions**

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2022-06-16	2023-06-15

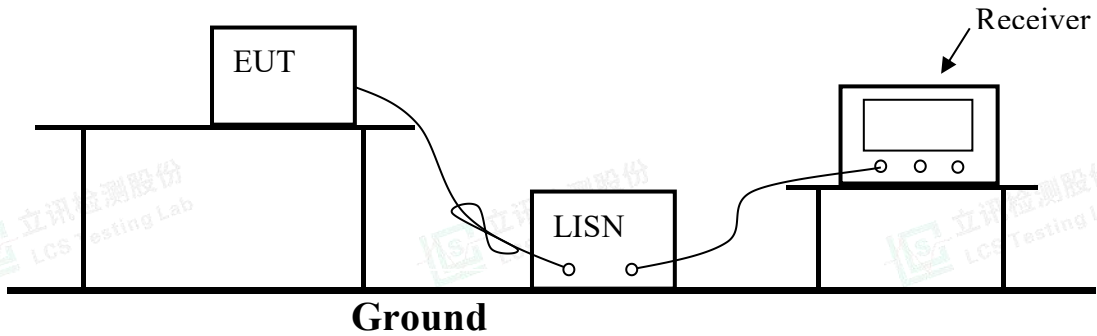


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## 4. TEST RESULTS

### 4.1. POWER Line CONDUCTED measurement

#### 4.1.1. Block Diagram of Test Setup



#### 4.1.2. Conducted Power Line Emission Measurement Standard and Limits

##### 4.1.2.1. Standard:

EN IEC 55015:2019+A11:2020

##### 4.1.2.2. Limits

Frequency	At mains terminals (dB $\mu$ 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.

#### 4.1.3. EUT Configuration on Test

The configuration of the EUT is same as Section 3.1.

#### 4.1.4. Operating Condition of EUT

4.1.4.1. Setup the EUT as shown in Section 4.1.1.

4.1.4.2. Turn on the power of all equipments.

4.1.4.3. Let the EUT work in test mode (1) and measure it.





#### 4.1.5. 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 EN 55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN 55015 standard.

The bandwidth of the test receiver is set at 200Hz in 9k~150kHz range and 9kHz in 150k~30MHz range.

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

All the test results are listed in Section 4.1.6.

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

#### 4.1.6. Test Results

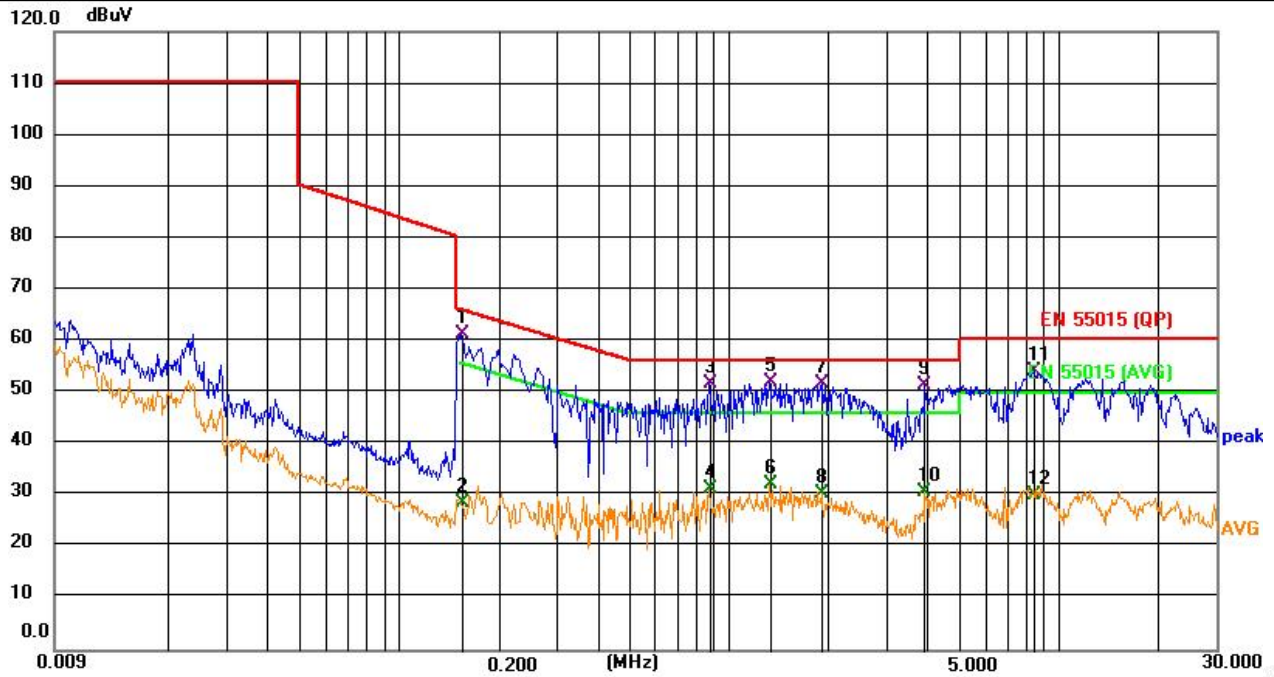
**PASS.**

The test result please refer to the next page.





<b>Test Model</b>	ZJ-BWCLAH-RGB WW-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	24.2°C, 53.5% RH	<b>Test Engineer</b>	Taylor Hu
<b>Pol</b>	Line	<b>Test Voltage</b>	AC 230V/50Hz



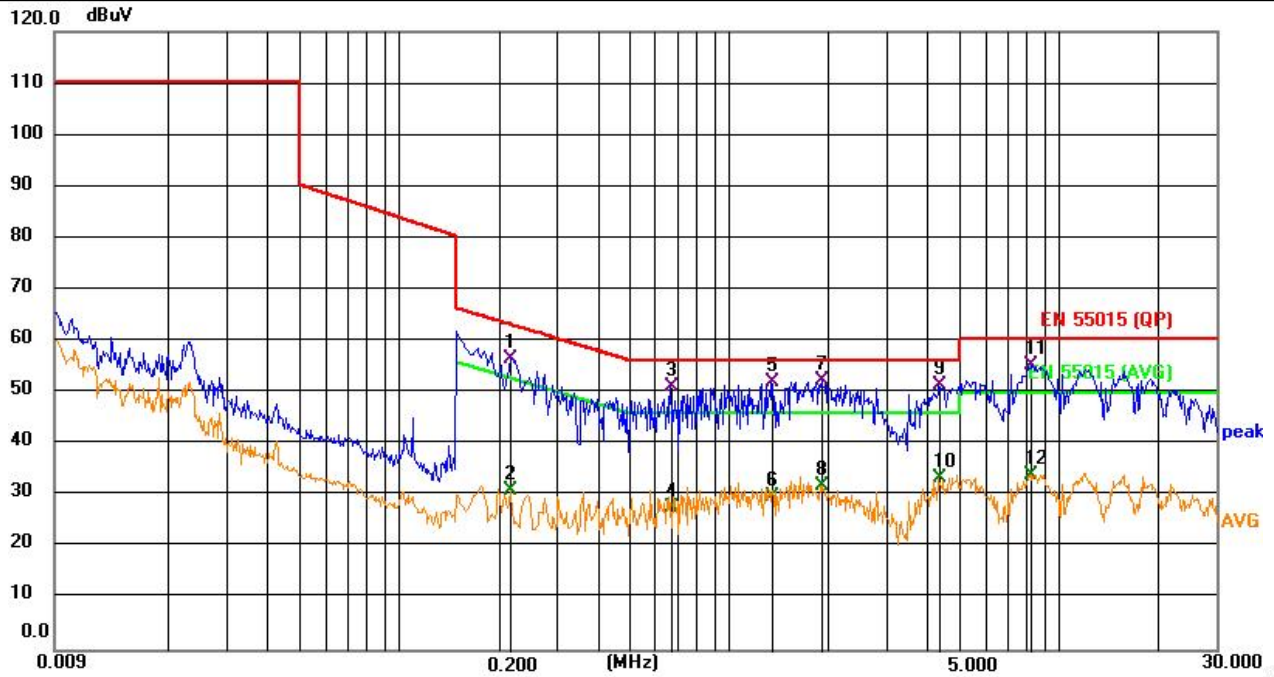
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.1546	41.59	19.63	61.22	65.75	-4.53	QP
2		0.1546	8.92	19.63	28.55	55.75	-27.20	AVG
3		0.8701	32.21	19.64	51.85	56.00	-4.15	QP
4		0.8701	11.57	19.64	31.21	46.00	-14.79	AVG
5	*	1.3246	32.31	19.66	51.97	56.00	-4.03	QP
6		1.3246	12.55	19.66	32.21	46.00	-13.79	AVG
7		1.9141	32.05	19.68	51.73	56.00	-4.27	QP
8		1.9141	10.63	19.68	30.31	46.00	-15.69	AVG
9		3.9391	31.68	19.70	51.38	56.00	-4.62	QP
10		3.9391	11.06	19.70	30.76	46.00	-15.24	AVG
11		8.4211	34.38	19.79	54.17	60.00	-5.83	QP
12		8.4211	10.44	19.79	30.23	50.00	-19.77	AVG







<b>Test Model</b>	ZJ-BWCLAH-RGB WW-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	24.2°C, 53.5% RH	<b>Test Engineer</b>	Taylor Hu
<b>Pol</b>	Neutral	<b>Test Voltage</b>	AC 230V/50Hz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.2176	36.98	19.63	56.61	62.91	-6.30	QP
2		0.2176	11.32	19.63	30.95	52.91	-21.96	AVG
3		0.6676	31.64	19.65	51.29	56.00	-4.71	QP
4		0.6676	8.15	19.65	27.80	46.00	-18.20	AVG
5		1.3471	32.42	19.66	52.08	56.00	-3.92	QP
6		1.3471	10.30	19.66	29.96	46.00	-16.04	AVG
7	*	1.9141	32.64	19.68	52.32	56.00	-3.68	QP
8		1.9141	12.40	19.68	32.08	46.00	-13.92	AVG
9		4.3306	31.60	19.80	51.40	56.00	-4.60	QP
10		4.3306	13.63	19.80	33.43	46.00	-12.57	AVG
11		8.2681	35.58	19.84	55.42	60.00	-4.58	QP
12		8.2681	14.28	19.84	34.12	50.00	-15.88	AVG

Margin= Reading level + Correct factor – Limit

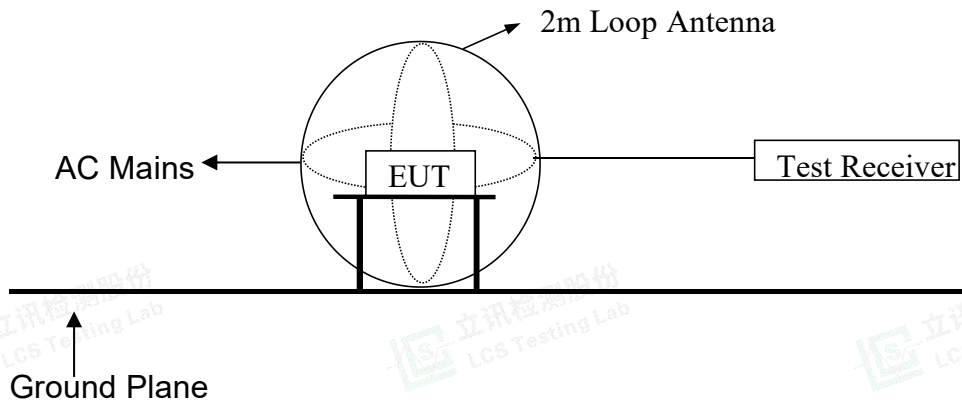
Correct Factor= Lisn Factor+Cable Factor



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## 4.2. Magnetic field emission MEASUREMENT

### 4.2.1. Block Diagram of Test Setup



### 4.2.2. Magnetic Field Emission Measurement Standard and Limits

#### 4.2.2.1. Test Standard

EN IEC 55015:2019+A11:2020

#### 4.2.2.2. Test Limits

Frequency	Limits for loop diameter (dB $\mu$ 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.

#### 4.2.3. EUT Configuration on Test

The configuration of the EUT is same as Section 3.3.

#### 4.2.4. Operating Condition of EUT

Same as conducted measurement which is listed in Section 4.1.4., except the test set up replaced by Section 4.2.1.

#### 4.2.5. 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 is set at 200Hz. For frequency band 150kHz to 30MHz, the bandwidth is set at 9kHz.

All the test results are listed in Section 4.2.6.

#### 4.2.6. Test Results

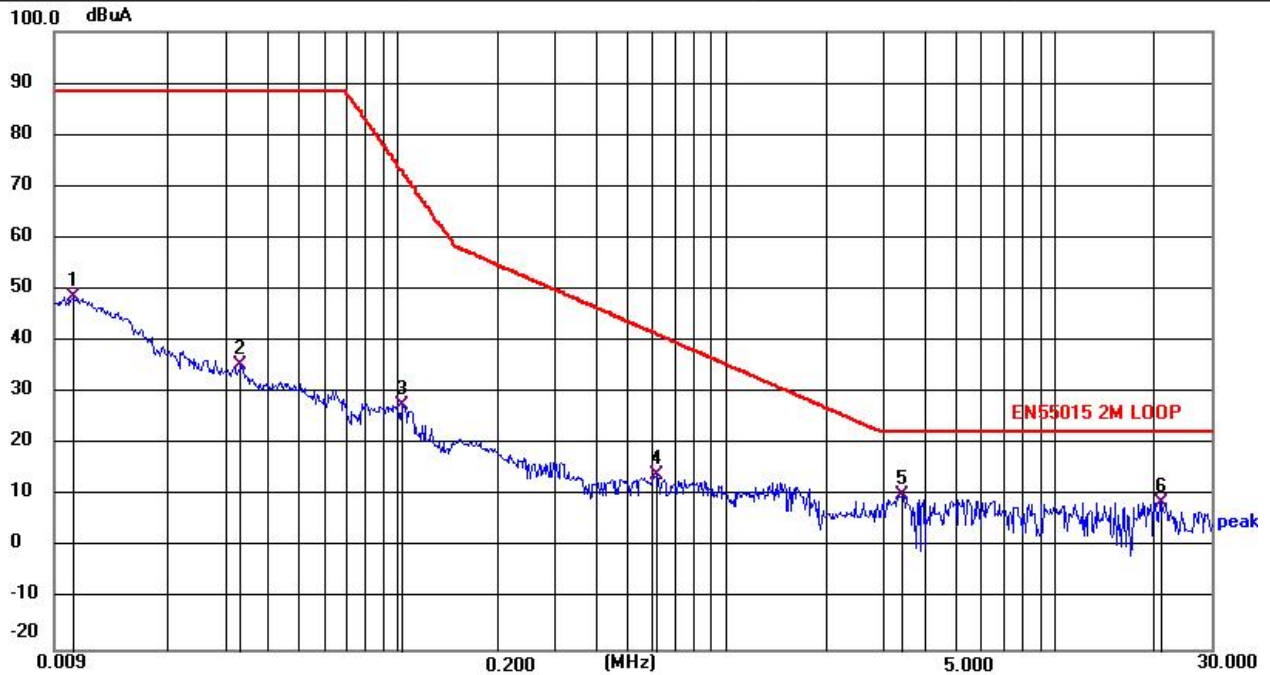
**PASS.**

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





<b>Test Model</b>	ZJ-BWCLAH-RGBW W-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	22.7°C, 53.7% RH	<b>Test Engineer</b>	Taylor Hu
<b>Pol</b>	X	<b>Test Voltage</b>	AC 230V/50Hz

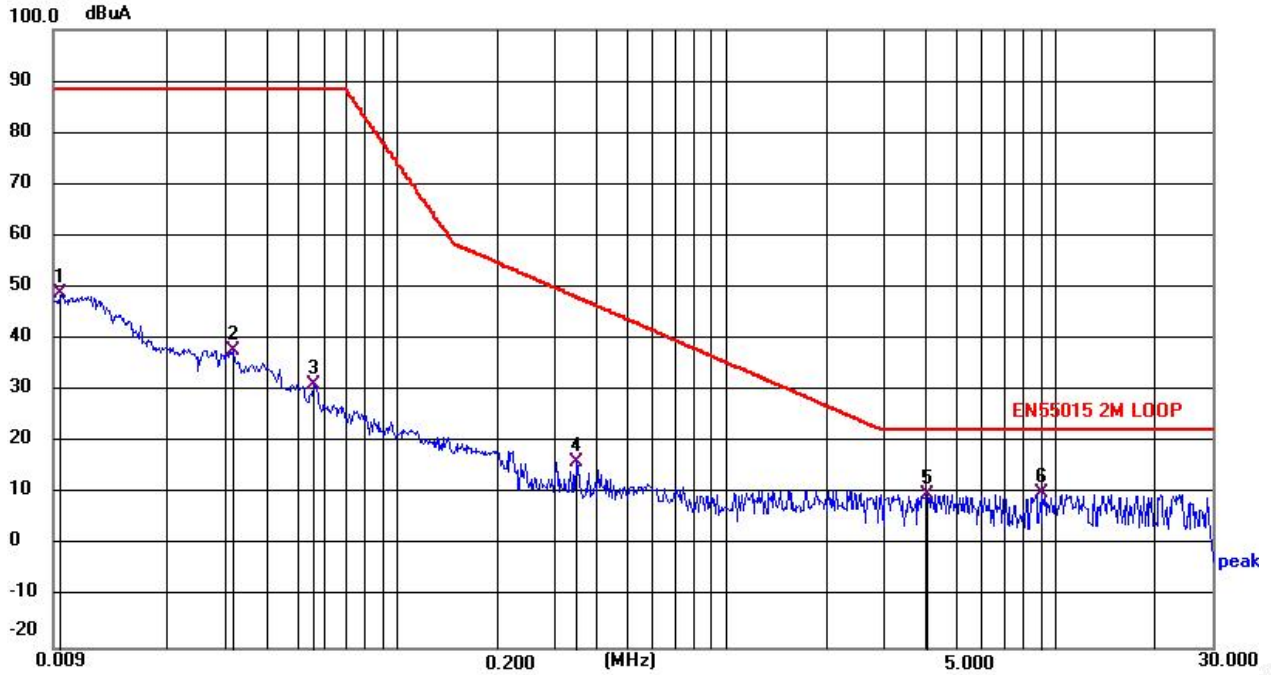


No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Margin dB	Detector
1		0.0102	43.93	4.52	48.45	88.00	-39.55	QP
2		0.0331	28.52	6.72	35.24	88.00	-52.76	QP
3		0.1028	18.76	8.90	27.66	72.87	-45.21	QP
4		0.6134	6.57	7.62	14.19	41.08	-26.89	QP
5	*	3.4485	6.59	3.44	10.03	22.00	-11.97	QP
6		21.2911	8.72	0.08	8.80	22.00	-13.20	QP





<b>Test Model</b>	ZJ-BWCLAH-RGB WW-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	22.7°C, 53.7% RH	<b>Test Engineer</b>	Taylor Hu
<b>Pol</b>	Y	<b>Test Voltage</b>	AC 230V/50Hz

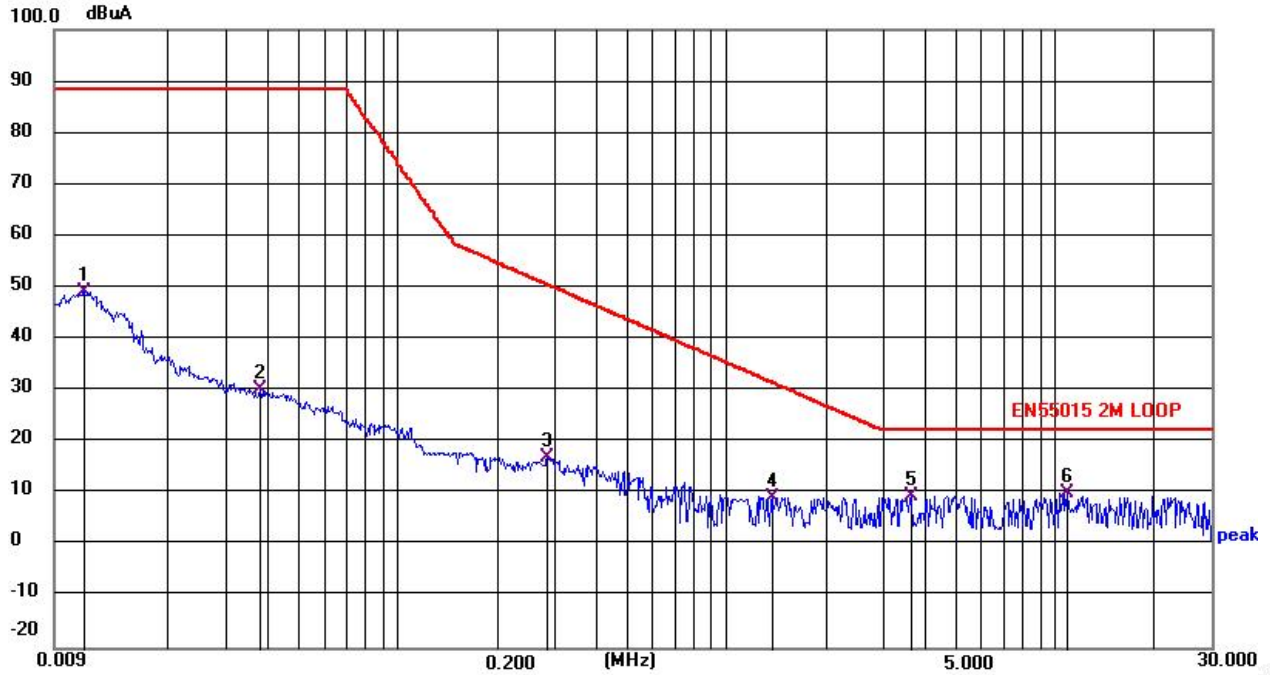


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Margin dB	Detector
1		0.0094	42.80	6.11	48.91	88.00	-39.09	QP
2		0.0318	31.33	6.50	37.83	88.00	-50.17	QP
3		0.0558	23.53	7.73	31.26	88.00	-56.74	QP
4		0.3491	9.26	6.75	16.01	47.85	-31.84	QP
5		4.0876	7.67	2.17	9.84	22.00	-12.16	QP
6	*	9.1591	4.20	6.03	10.23	22.00	-11.77	QP





<b>Test Model</b>	ZJ-BWCLAH-RGB WW-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	22.7°C, 53.7% RH	<b>Test Engineer</b>	Taylor Hu
<b>Pol</b>	Z	<b>Test Voltage</b>	AC 230V/50Hz



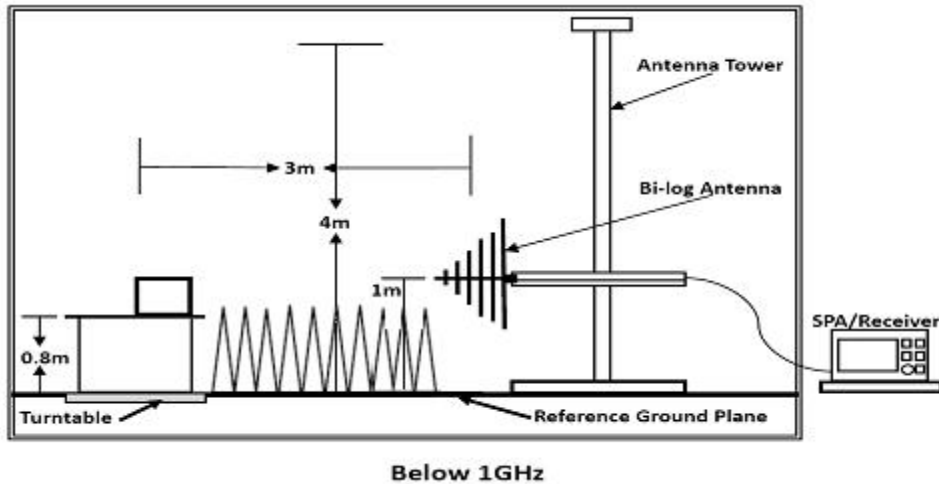
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Margin dB	Detector
1		0.0111	44.63	4.51	49.14	88.00	-38.86	QP
2		0.0383	22.61	7.62	30.23	88.00	-57.77	QP
3		0.2847	9.49	7.42	16.91	50.30	-33.39	QP
4		1.3785	2.87	6.51	9.38	31.34	-21.96	QP
5		3.6646	6.57	2.98	9.55	22.00	-12.45	QP
6	*	10.9634	4.98	5.31	10.29	22.00	-11.71	QP



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### 4.3. RADIATED EMISSION MEASUREMENT

#### 4.3.1. Block Diagram of Test Setup



#### 4.3.2. Test Standard

EN IEC 55015:2019+A11:2020

#### 4.3.3. Radiated Emission Limits

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB $\mu$ V/m)
30 ~ 230	3	42-35
230 ~ 1000	3	42

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.

#### 4.3.4. EUT Configuration on Test

The EN 55015 regulations test method must be used to find the maximum emission during radiated emission measurement.

#### 4.3.5. Operating Condition of EUT

##### 4.3.5.1 Turn on the power.

##### 4.3.5.2 After that, let the EUT work in test mode (1) and measure it.





#### 4.3.6. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable 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 an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

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

#### 4.3.7. Test Results

**PASS.**

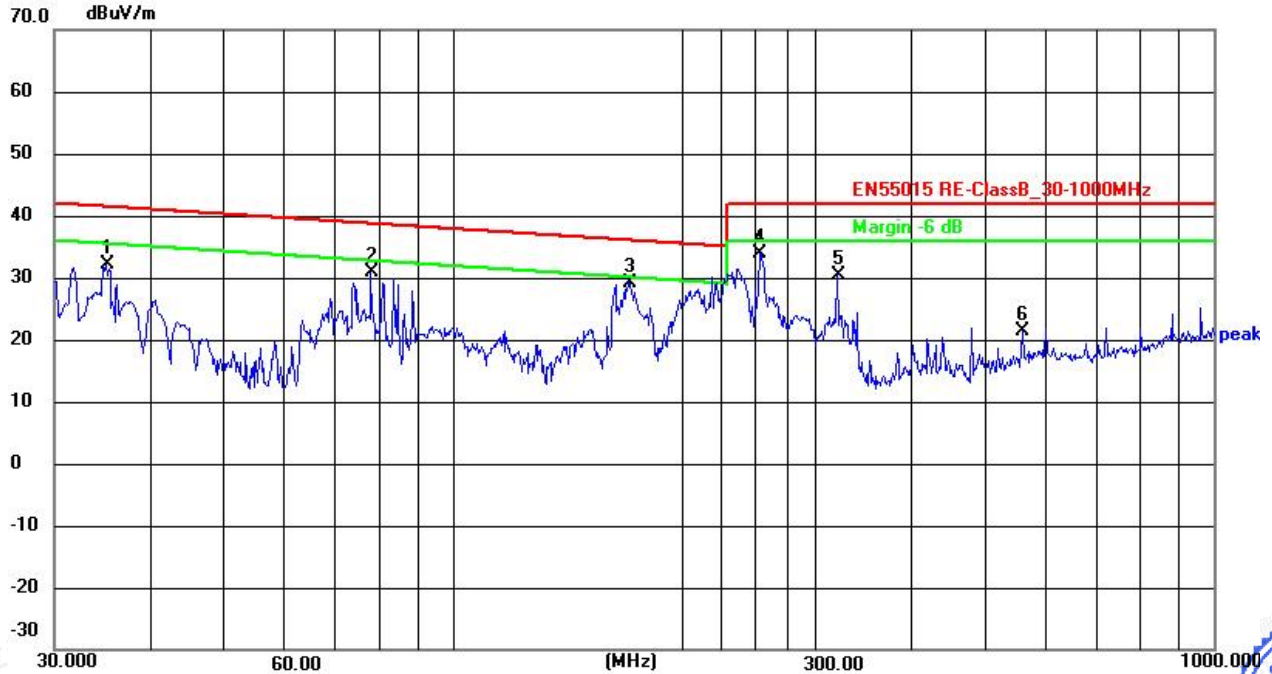
The test result please refer to the next page.







<b>Test Model</b>	ZJ-BWCLAH-RGB WW-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	23.5°C, 52.2% RH	<b>Detector Function</b>	Quasi-peak
<b>Pol</b>	Horizontal	<b>Distance</b>	3m
<b>Test Engineer</b>	Taylor Hu	<b>Test Voltage</b>	AC 230V/50Hz

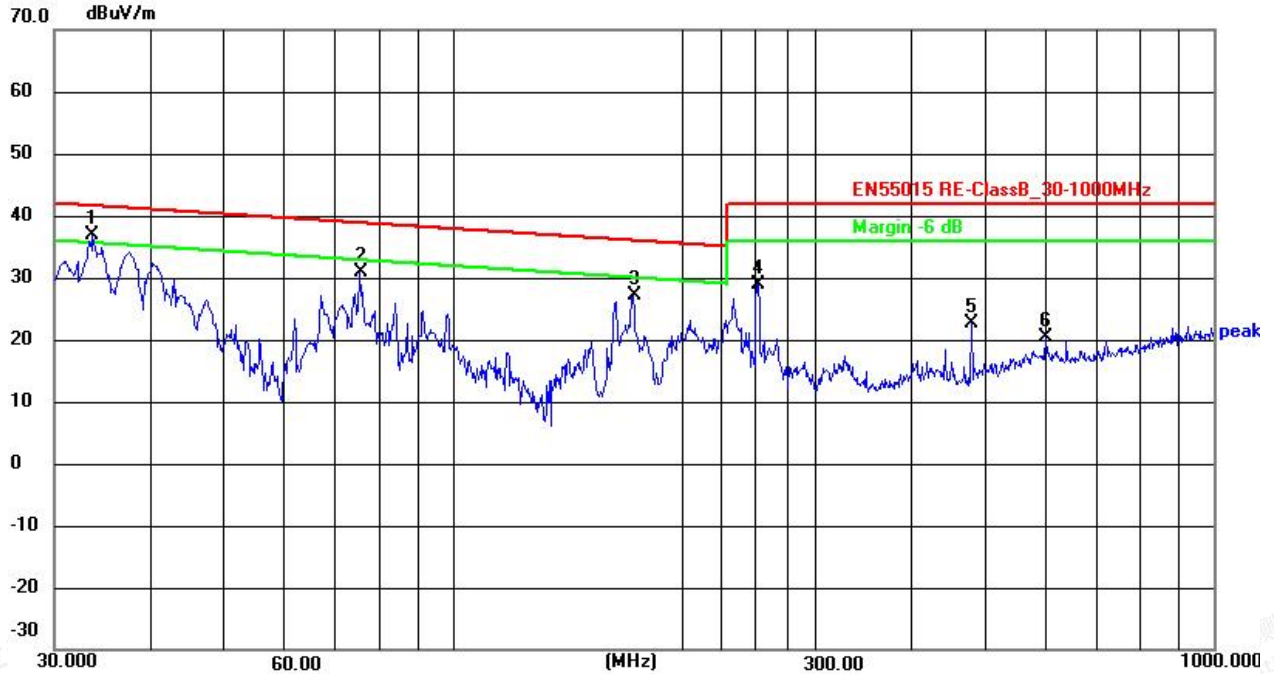


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.1278	49.96	-17.79	32.17	41.46	-9.29	QP
2	78.1389	50.64	-19.80	30.84	38.71	-7.87	QP
3	170.7926	48.72	-19.47	29.25	36.02	-6.77	QP
4	252.9482	49.53	-15.58	33.95	42.00	-8.05	QP
5	319.9370	44.92	-14.48	30.44	42.00	-11.56	QP
6	560.6928	32.76	-11.40	21.36	42.00	-20.64	QP





<b>Test Model</b>	ZJ-BWCLAH-RGB WW-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	23.5°C, 52.2% RH	<b>Detector Function</b>	Quasi-peak
<b>Pol</b>	Vertical	<b>Distance</b>	3m
<b>Test Engineer</b>	Taylor Hu	<b>Test Voltage</b>	AC 230V/50Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	33.6802	54.87	-17.97	36.90	41.60	-4.70	QP
2	75.4464	50.48	-19.69	30.79	38.83	-8.04	QP
3	172.5988	46.41	-19.31	27.10	35.99	-8.89	QP
4	252.0627	44.40	-15.58	28.82	42.00	-13.18	QP
5	480.5276	36.86	-14.18	22.68	42.00	-19.32	QP
6	601.4265	30.92	-10.47	20.45	42.00	-21.55	QP

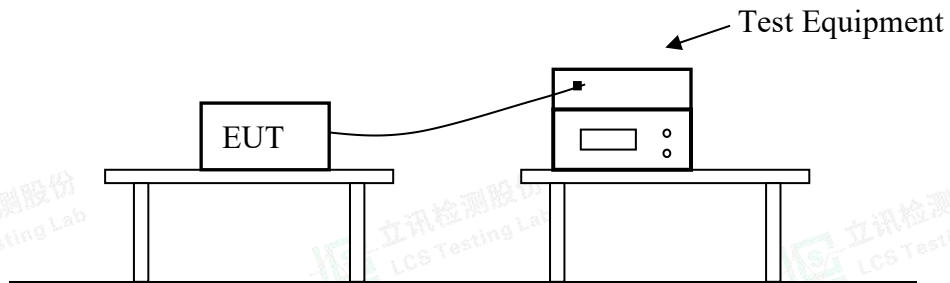
Note: Margin= Reading level + Correct factor – Limit  
 Correct Factor=Antenna Factor+Cable Factor- Pre-amplifier Factor



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## 4.4. HARMONIC CURRENT MEASUREMENT

### 4.4.1. Block Diagram of Test Setup



### 4.4.2. Test Standard

EN IEC 61000-3-2:2019/A1:2021

### 4.4.3. Operating Condition of EUT

Same as Section 4.1.4, except the test setup replaced by Section 4.4.1.

### 4.4.4. Test Results

**PASS.**

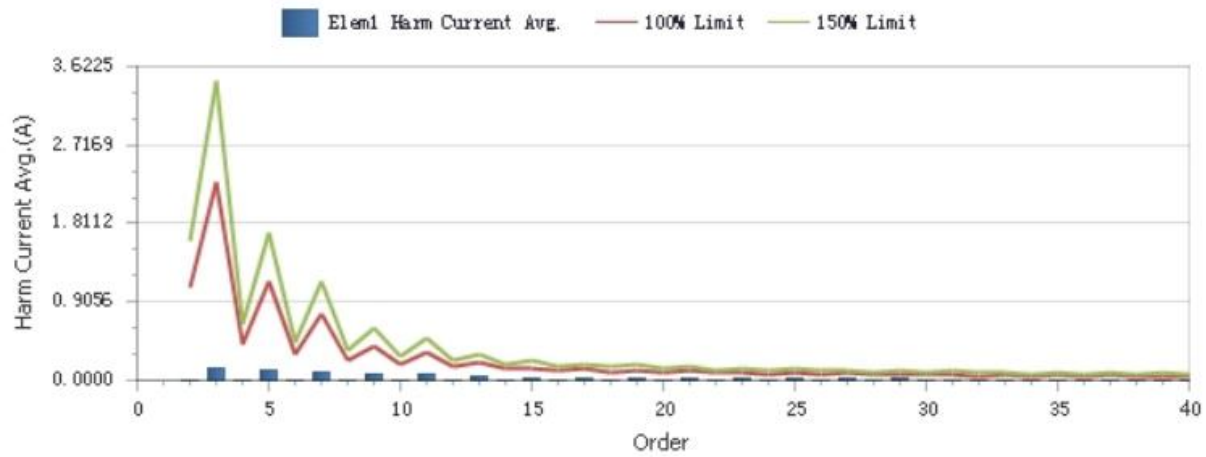
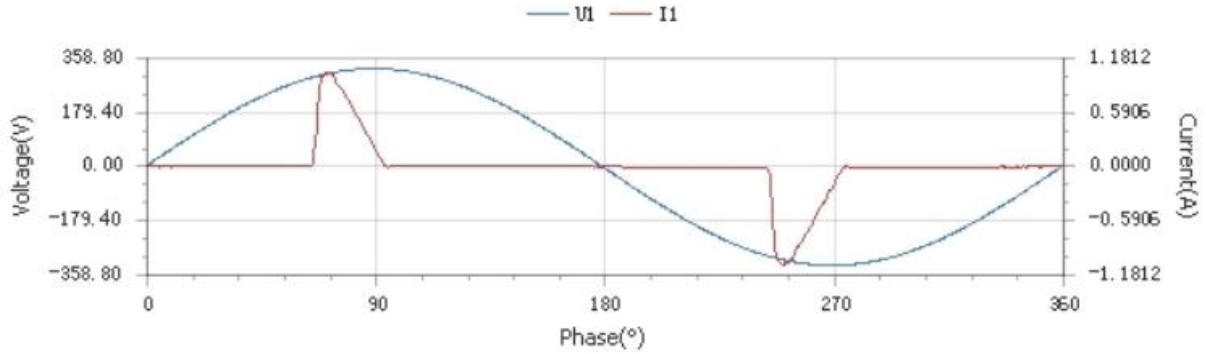
The test result please refer to the next page.





<b>Test Model</b>	ZJ-BWCLAH-RGB WW-R12C2	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	23.2°C, 55.1% RH	<b>Test Voltage</b>	AC 230V/50Hz

Customer : Result : Pass





Customer : Result : Pass

Total Current Harmonics and Some Odd Harmonic Parameters

THC(A)	0.2386	THD(%)	174.27	POHC(A)	0.0488	POHC Limit(A)	0.2514
--------	--------	--------	--------	---------	--------	---------------	--------

Maximum Value of Relevant Parameter During Test Period

Urms (V)	230.16	Freq(Hz)	50.000
Irms (A)	0.2762	Ipeak (A)	1.0723
II (A)	0.1376	ICF	3.9278
P(W)	30.697	λ	0.4826

Determination of Harmonics and Limits

Order (n)	Harmonics Current Avg. (A)	100% Limit (A)	Limit Percent (%)	Harmonics Current Max. (A)	150% Limit (A)	Limit Percent (%)	Result
2	0.0048	1.0800	N/A	0.0050	1.6200	N/A	Pass
3	0.1294	2.3000	5.63	0.1300	3.4500	3.77	Pass
4	0.0047	0.4300	N/A	0.0049	0.6450	N/A	Pass
5	0.1167	1.1400	10.24	0.1171	1.7100	6.85	Pass
6	0.0047	0.3000	N/A	0.0048	0.4500	N/A	Pass
7	0.0995	0.7700	12.92	0.0998	1.1550	8.64	Pass
8	0.0046	0.2300	N/A	0.0047	0.3450	N/A	Pass
9	0.0798	0.4000	19.95	0.0800	0.6000	13.33	Pass
10	0.0045	0.1840	N/A	0.0047	0.2760	N/A	Pass
11	0.0601	0.3300	18.21	0.0602	0.4950	12.16	Pass
12	0.0044	0.1533	N/A	0.0045	0.2300	N/A	Pass
13	0.0429	0.2100	20.43	0.0430	0.3150	13.65	Pass
14	0.0043	0.1314	N/A	0.0044	0.1971	N/A	Pass
15	0.0308	0.1500	20.53	0.0309	0.2250	13.73	Pass
16	0.0041	0.1150	N/A	0.0043	0.1725	N/A	Pass
17	0.0253	0.1324	19.11	0.0254	0.1985	12.80	Pass
18	0.0040	0.1022	N/A	0.0042	0.1533	N/A	Pass
19	0.0243	0.1184	20.52	0.0244	0.1776	13.74	Pass
20	0.0039	0.0920	N/A	0.0040	0.1380	N/A	Pass
21	0.0238	0.1071	22.22	0.0239	0.1607	14.87	Pass
22	0.0038	0.0836	N/A	0.0039	0.1255	N/A	Pass
23	0.0220	0.0978	22.49	0.0220	0.1467	15.00	Pass
24	0.0037	0.0767	N/A	0.0038	0.1150	N/A	Pass
25	0.0188	0.0900	20.89	0.0189	0.1350	14.00	Pass
26	0.0035	0.0708	N/A	0.0037	0.1062	N/A	Pass
27	0.0153	0.0833	18.37	0.0154	0.1250	12.32	Pass
28	0.0034	0.0657	N/A	0.0035	0.0986	N/A	Pass
29	0.0127	0.0776	16.37	0.0127	0.1164	10.91	Pass
30	0.0033	0.0613	N/A	0.0034	0.0920	N/A	Pass
31	0.0116	0.0726	15.98	0.0117	0.1089	10.74	Pass
32	0.0032	0.0575	N/A	0.0033	0.0863	N/A	Pass
33	0.0115	0.0682	16.86	0.0116	0.1023	11.34	Pass
34	0.0031	0.0541	N/A	0.0032	0.0812	N/A	Pass
35	0.0113	0.0643	17.57	0.0113	0.0964	11.72	Pass
36	0.0030	0.0511	N/A	0.0031	0.0767	N/A	Pass
37	0.0104	0.0608	17.11	0.0104	0.0912	11.40	Pass
38	0.0029	0.0484	N/A	0.0030	0.0726	N/A	Pass
39	0.0089	0.0577	15.42	0.0090	0.0865	10.40	Pass
40	0.0028	0.0460	N/A	0.0029	0.0690	N/A	Pass



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Customer : Result : Pass

Determination of Voltage Relevant Parameter During Test Period

Item	Nominal Value	Tested Value	Error Value	Allowable Error Value	Result
Urms(V)	230.00	230.17	0.17	±2.0%	Pass
Frequency (Hz)	50.000	50.001	0.001	±0.5%	Pass
CFU	1.4100	1.4177	0.0077	±0.01	Pass
Peak-Volt Phase	90.00	90.00	0.00	±3	Pass

Determination of Voltage Harmonics and Limits

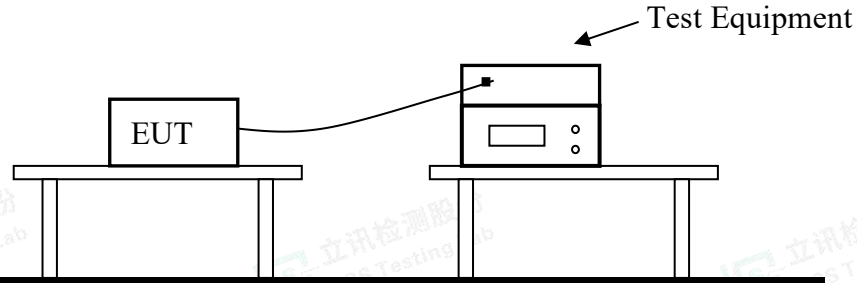
Order (n)	U <sub>hdf</sub>	Limit (%)	Limit Percent (%)	Result
1	100%	---	---	---
2	0.01%	0.20	6.01%	Pass
3	0.02%	0.90	1.94%	Pass
4	0.00%	0.20	1.21%	Pass
5	0.00%	0.40	0.95%	Pass
6	0.00%	0.20	0.97%	Pass
7	0.00%	0.30	1.01%	Pass
8	0.00%	0.20	2.07%	Pass
9	0.01%	0.20	3.92%	Pass
10	0.01%	0.20	4.74%	Pass
11	0.00%	0.10	1.86%	Pass
12	0.01%	0.10	8.61%	Pass
13	0.00%	0.10	4.55%	Pass
14	0.00%	0.10	4.65%	Pass
15	0.00%	0.10	2.00%	Pass
16	0.00%	0.10	1.84%	Pass
17	0.00%	0.10	3.19%	Pass
18	0.00%	0.10	0.85%	Pass
19	0.00%	0.10	1.65%	Pass
20	0.00%	0.10	0.97%	Pass
21	0.00%	0.10	3.01%	Pass
22	0.00%	0.10	0.95%	Pass
23	0.00%	0.10	3.10%	Pass
24	0.00%	0.10	1.06%	Pass
25	0.00%	0.10	3.68%	Pass
26	0.00%	0.10	0.90%	Pass
27	0.00%	0.10	2.70%	Pass
28	0.00%	0.10	0.90%	Pass
29	0.00%	0.10	2.81%	Pass
30	0.00%	0.10	1.15%	Pass
31	0.00%	0.10	2.06%	Pass
32	0.00%	0.10	0.91%	Pass
33	0.00%	0.10	1.85%	Pass
34	0.00%	0.10	1.16%	Pass
35	0.00%	0.10	1.74%	Pass
36	0.00%	0.10	1.18%	Pass
37	0.00%	0.10	2.22%	Pass
38	0.00%	0.10	1.15%	Pass
39	0.00%	0.10	1.65%	Pass
40	0.00%	0.10	0.97%	Pass



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## 4.5. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

### 4.5.1. Block Diagram of Test Setup



### 4.5.2. Test Standard

EN 61000-3-3:2013/A2:2021

### 4.5.3. Operating Condition of EUT

Same as Section 4.1.4, except the test setup replaced by Section 4.5.1.

### 4.5.4. Test Results

**PASS.**

The test result please refer to the next page.

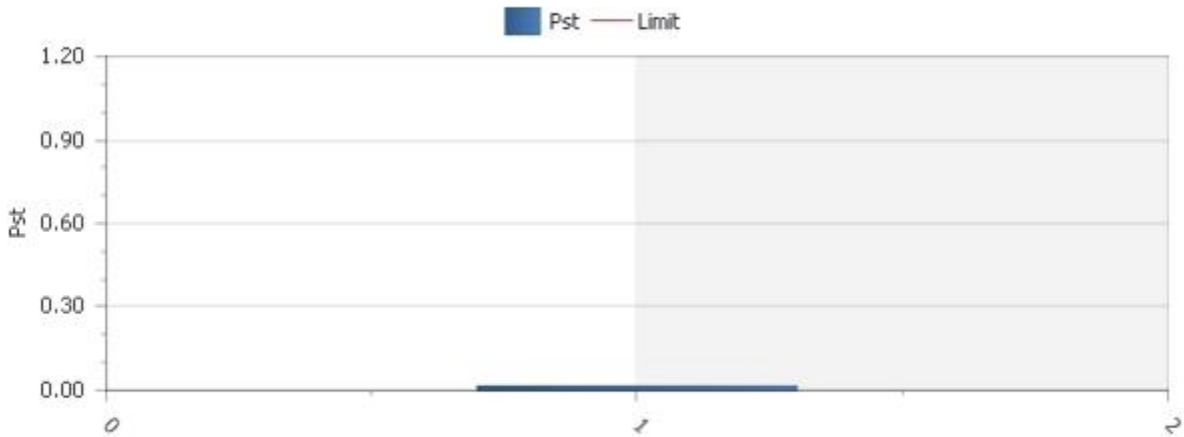




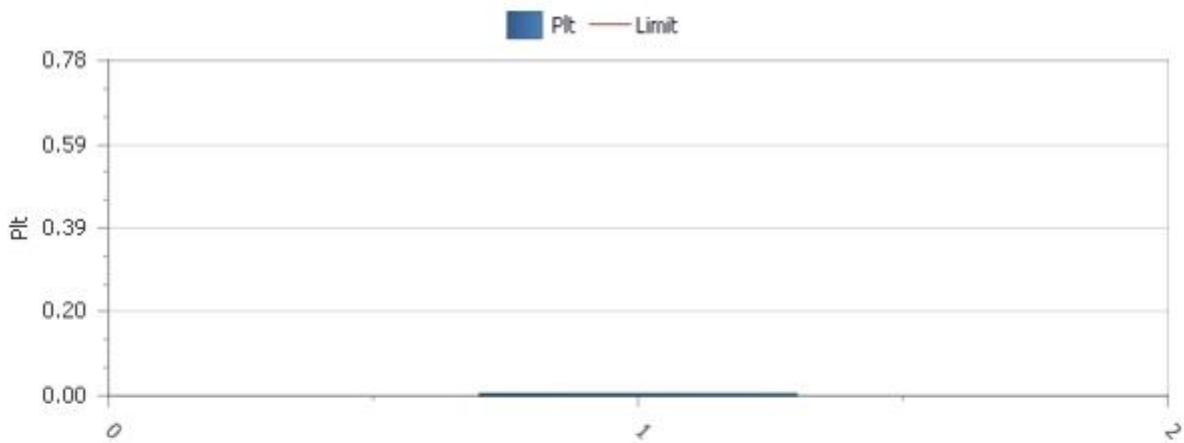
<b>Test Model</b>	ZJ-BWCLAH-RGBWW-R12C2	<b>Test Engineer</b>	Taylor Hu
<b>Environmental Conditions</b>	23.3°C, 55.2% RH	<b>Test Voltage</b>	AC 230V/50Hz

Customer : Result : PASS

Pst and Limit



Plt and Limit



Relevant Parameter and Judgement During Test Period

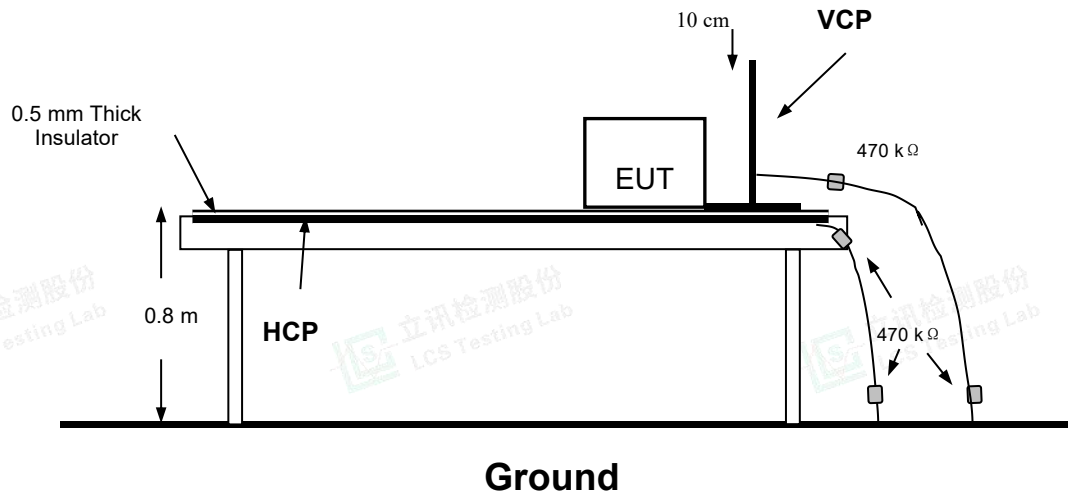
Vrms at the end of test (V)	230.41			
Error Max(%)		Test Limit(%)		
T-max (ms)	0.00	Test Limit(ms)	500	Pass
dc (%)	0.00	Test Limit(%)	3.30	Pass
dmax (%)	0.00	Test Limit(%)	4.00	Pass
Pst	0.013	Test Limit	1.000	Pass
Plt	0.006	Test Limit	0.650	Pass





## 4.6. Electrostatic Discharge TEST

### 4.6.1. Block Diagram of Test Setup



### 4.6.2. Test Standard

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

### 4.6.3. Severity Levels and Performance Criterion

#### 4.6.3.1. Severity level

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

#### 4.6.3.2. Performance criterion: **B**

### 4.6.4. EUT Configuration on Test

The configuration of EUT is listed in Section 3.7

### 4.6.5. Operating Condition of EUT

4.6.5.1. Setup the EUT as shown in Section 4.6.1.

4.6.5.2. Turn on the power of all equipments.





4.6.5.3. Let the EUT work in test mode (1) and measure it.

#### 4.6.6. Test Procedure

##### 4.6.6.1. Air Discharge

This test is done on a non-conductive surfaces. 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.

Because the case of the EUT is metal surface, so it does not need to be tested.

##### 4.6.6.2. Contact Discharge

All the procedure shall be same as Section 4.6.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

##### 4.6.6.3. 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.

##### 4.6.6.4. 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.

#### 4.6.7. Test Results

**PASS.**

Please refer to the following page.





# Electrostatic Discharge Test Results

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2		
<b>Applicant</b>	JM Zengge Co.,Ltd		
<b>EUT</b>	LED Ceiling Light	<b>Temperature</b>	23.3℃
<b>M/N</b>	ZJ-BWCLAH-RGBWW-R12C2	<b>Humidity</b>	52.5%
<b>Criterion</b>	B	<b>Pressure</b>	1021mbar
<b>Test Mode</b>	Mode 1	<b>Test Engineer</b>	Taylor Hu

## Air Discharge

Test Points	Test Levels			Results		
	± 2KV	± 4KV	± 8KV	Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

## Contact Discharge

Test Points	Test Levels		Results		
	± 2 KV	±4 KV	Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

## Discharge To Horizontal Coupling Plane

Side of EUT	Test Levels		Results		
	± 2 KV	± 4 KV	Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

## Discharge To Vertical Coupling Plane

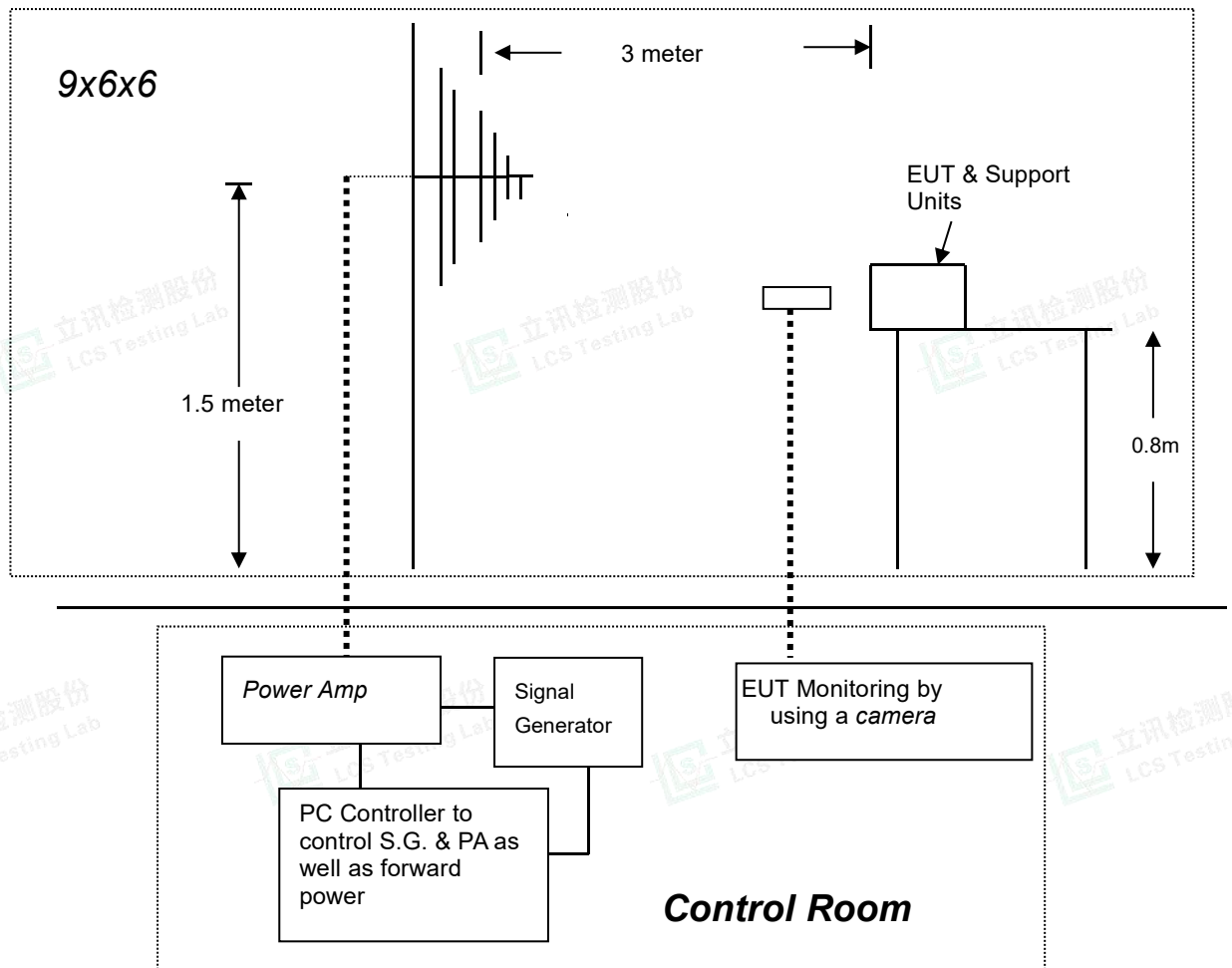
Side of EUT	Test Levels		Results		
	± 2 KV	± 4 KV	Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B



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### 4.7. RF Field Strength susceptibility Test

#### 4.7.1. Block Diagram of Test Setup



#### 4.7.2. Test Standard

EN 61547: 2009 (EN 61000-4-3, Severity Level: 2, 3V / m)

#### 4.7.3. Severity Levels and Performance Criterion

##### 4.7.3.1. Severity level

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

##### 4.7.3.2. Performance criterion: A

#### 4.7.4. EUT Configuration on Test





The configuration of EUT are listed in Section 3.8.

4.7.5. Operating Condition of EUT

4.7.5.1. Setup the EUT as shown in Section 4.7.1.

4.7.5.2. Turn on the power of all equipments.

4.7.5.3. Let the EUT work in test mode (1) and measure it.

4.7.6. 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 polarization 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	Unmodulated
3. Scanning Frequency	80 - 6000 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	3 Sec.

4.7.7. Test Results

**PASS.**

Please refer to the following page.





# RF Field Strength Susceptibility Test Results

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-3 <input checked="" type="checkbox"/> EN 61000-4-3		
<b>Applicant</b>	JM Zengge Co.,Ltd		
<b>EUT</b>	LED Ceiling Light	<b>Temperature</b>	23.4℃
<b>M/N</b>	ZJ-BWCLAH-RGBWW-R12C 2	<b>Humidity</b>	53.1%
<b>Field Strength</b>	3 V/m	<b>Criterion</b>	A
<b>Test Mode</b>	Mode 1	<b>Test Engineer</b>	Taylor Hu
<b>Frequency Range</b>	80 MHz to 6000 MHz		
<b>Modulation</b>	<input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1KHz 80%		
<b>Steps</b>	1%		

	Horizontal	Vertical
<b>Front</b>	PASS	PASS
<b>Right</b>	PASS	PASS
<b>Rear</b>	PASS	PASS
<b>Left</b>	PASS	PASS

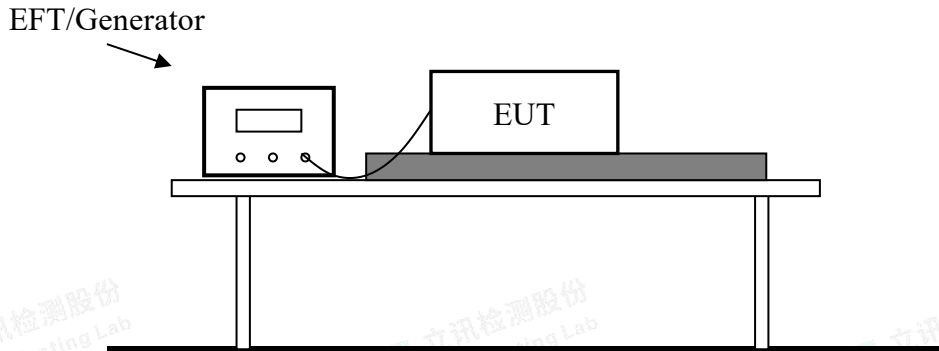
Note:



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### 4.8. Electrical Fast Transient/Burst Test

#### 4.8.1. Block Diagram of Test Setup



#### 4.8.2. Test Standard

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

#### 4.8.3. Severity Levels and Performance Criterion

##### 4.8.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

##### 4.8.3.2. Performance criterion: **B**

#### 4.8.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.9.

#### 4.8.5. Operating Condition of EUT

- 11.5.1. Setup the EUT as shown in Section 4.8.1.
- 11.5.2. Turn on the power of all equipments.
- 11.5.3. Let the EUT work in test mode (1) and measure it.

#### 4.8.6. 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.





4.8.6.1. 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.

4.8.6.2. For signal lines and control lines ports:

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

4.8.6.3. For DC output line ports:

It's unnecessary to test.

4.8.7. Test Results

**PASS.**

Please refer to the following page.







# Electrical Fast Transient/Burst Test Results

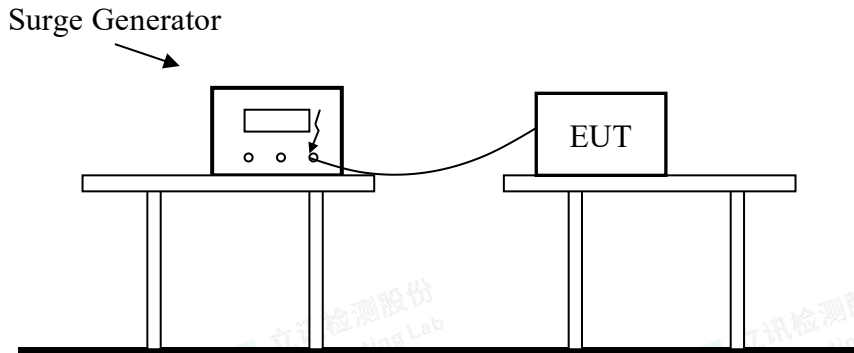
<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-4 <input checked="" type="checkbox"/> EN 61000-4-4		
<b>Applicant</b>	JM Zengge Co.,Ltd		
<b>EUT</b>	LED Ceiling Light	<b>Temperature</b>	23.2℃
<b>M/N</b>	ZJ-BWCLAH-RGBWW-R12C2	<b>Humidity</b>	54.1%
<b>Test Mode</b>	Mode 1	<b>Criterion</b>	B
<b>Test Engineer</b>	Taylor Hu		

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
PE			
L-N	1KV	PASS	PASS
L-PE			
N-PE			
L-N-PE			
Signal Line			
I/O Cable			
Note:			



## 4.9. SURGE immunity Test

### 4.9.1. Block Diagram of Test Setup



### 4.9.2. Test Standard

EN 61547: 2009 (EN61000-4-5: 2014, Severity Level: Line to Line: Level 2, 1.0KV;  
Line to Earth: Level 3, 2.0KV)

### 4.9.3. Severity Levels and Performance Criterion

#### 4.9.3.1. Severity level

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

#### 4.9.3.2. Performance criterion: **B**

### 4.9.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.10

### 4.9.5. Operating Condition of EUT

4.9.5.1. Setup the EUT as shown in Section 4.9.1.

4.9.5.2. Turn on the power of all equipments.

4.9.5.3. Let the EUT work in test mode (1) and measure it.





#### 4.9.6. Test Procedure

4.9.6.1. Set up the EUT and test generator as shown on Section 4.9.1.

4.9.6.2. For line to line coupling mode, provide a 1.0KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

4.9.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

4.9.6.4. Different phase angles are done individually.

4.9.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

#### 4.9.7. Test Results

**PASS.**

Please refer to the following page.





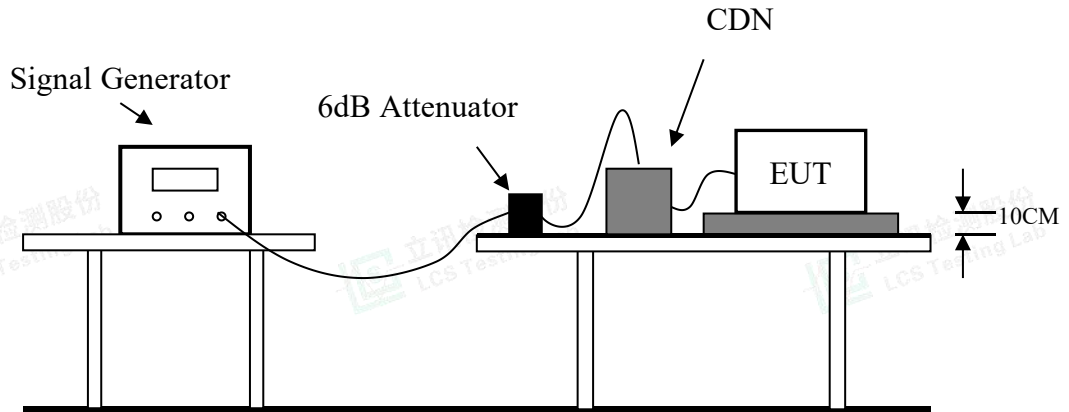
Surge Immunity Test Result			
<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-5 <input checked="" type="checkbox"/> EN 61000-4-5		
<b>Applicant</b>	JM Zengge Co.,Ltd		
<b>EUT</b>	LED Ceiling Light	<b>Temperature</b>	23.1°C
<b>M/N</b>	ZJ-BWCLAH-RGBWW-R12C2	<b>Humidity</b>	53.2%
<b>Test Mode</b>	Mode 1	<b>Criterion</b>	B
<b>Test Engineer</b>	Taylor Hu		

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	0°	5	1.0	PASS
	+	90°	5	1.0	PASS
	+	180°	5	1.0	PASS
	+	270°	5	1.0	PASS
	-	0°	5	1.0	PASS
	-	90°	5	1.0	PASS
	-	180°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					



### 4.10. Injected currents susceptibility test

#### 4.10.1. Block Diagram of Test Setup



#### 4.10.2. Test Standard

EN 61547: 2009 (EN 61000-4-6, Severity Level: 3V (rms), 0.15MHz ~ 80MHz)

#### 4.10.3. Severity Levels and Performance Criterion

##### 4.10.3.1. Severity level

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

##### 4.10.3.2. Performance criterion: A

#### 4.10.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.11.

#### 4.10.5. Operating Condition of EUT

##### 4.10.5.1. Setup the EUT as shown in Section 4.10.1.

##### 4.10.5.2. Turn on the power of all equipments.





4.10.5.3. Let the EUT work in test mode (1) and measure it.

#### 4.10.6. Test Procedure

4.10.6.1. Set up the EUT, CDN and test generators as shown on Section 4.10.1.

4.10.6.2. Let the EUT work in test mode and measure it.

4.10.6.3. 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).

4.10.6.4. The disturbance signal described below is injected to EUT through CDN.

4.10.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.

4.10.6.6. 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.

4.10.6.7. The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  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.

4.10.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

#### 4.10.7. Test Results

**PASS.**

Please refer to the following page.





# Injected Currents Susceptibility Test Results

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-6 <input checked="" type="checkbox"/> EN 61000-4-6		
<b>Applicant</b>	JM Zengge Co.,Ltd		
<b>EUT</b>	LED Ceiling Light	<b>Temperature</b>	23.8℃
<b>M/N</b>	ZJ-BWCLAH-RGBWW-R12C2	<b>Humidity</b>	54.2%
<b>Test Mode</b>	Mode 1	<b>Criterion</b>	A
<b>Test Engineer</b>	Taylor Hu		

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Mains	3V	A	PASS

**Remark:**

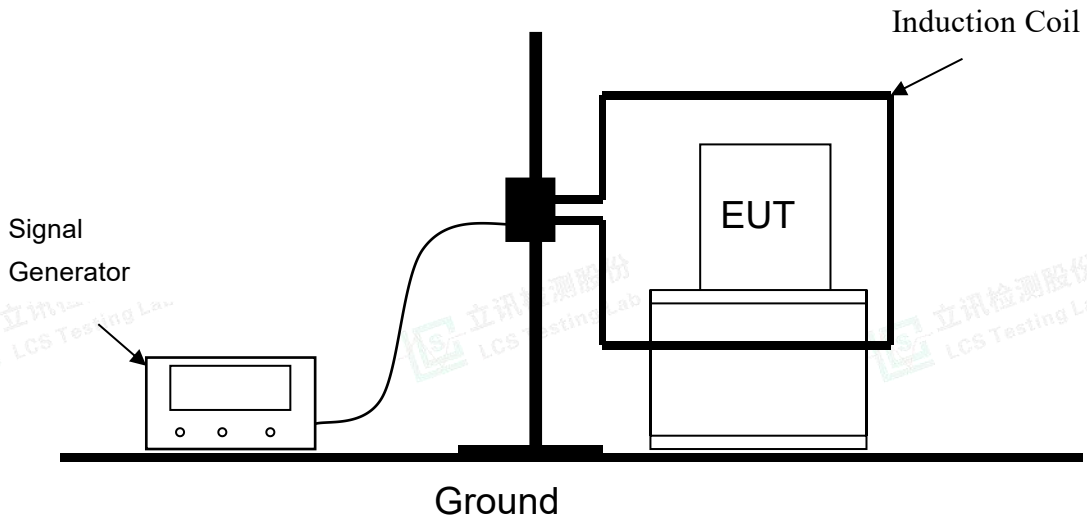
- 1. Modulation Signal:1kHz 80% AM
- 2. Measurement Equipment:  
     Simulator: CIT-10 (FRANKONIA)  
     CDN : CDN-M2 (FRANKONIA)  
          CDN-M3 (FRANKONIA)

**Note:**



### 4.11. Magnetic Field immunity test

#### 4.11.1. Block Diagram of Test Setup



#### 4.11.2. Test Standard

EN 61547: 2009 (EN 61000-4-8, Severity Level 2: 3A/m)

#### 4.11.3. Severity Levels and Performance Criterion

##### 4.11.3.1. Severity level

Level	Magnetic Field Strength (A/m)
1.	1
2.	3
3.	10
4.	30
5.	100
X	Special

##### 4.11.3.2. Performance criterion: A

#### 4.11.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.12.

#### 4.11.5. Operating Condition of EUT

4.11.5.1. Setup the EUT as shown in Section 4.11.1.

4.11.5.2. Turn on the power of all equipments.

4.11.5.3. Let the EUT work in test mode (1) and measure it.







#### 4.11.6.Test Procedure

4.11.6.1.Set up the EUT system as shown on Section 4.11.1.

4.11.6.2.The Induction coil is set up in horizontal or vertical.

4.11.6.3.Let the EUT work in test mode and measure it.

#### 4.11.7.Test Results

**PASS.**

Please refer to the following page.





## Magnetic Field Immunity Test Result

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-8 <input checked="" type="checkbox"/> EN 61000-4-8		
<b>Applicant</b>	JM Zengge Co.,Ltd		
<b>EUT</b>	LED Ceiling Light	<b>Temperature</b>	23.1℃
<b>M/N</b>	ZJ-BWCLAH-RGBWW-R12C2	<b>Humidity</b>	54.1%
<b>Test Mode</b>	Mode 1	<b>Criterion</b>	A
<b>Test Engineer</b>	Taylor Hu		

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
3	5 mins	X	A	PASS
3	5 mins	Y	A	PASS
3	5 mins	Z	A	PASS

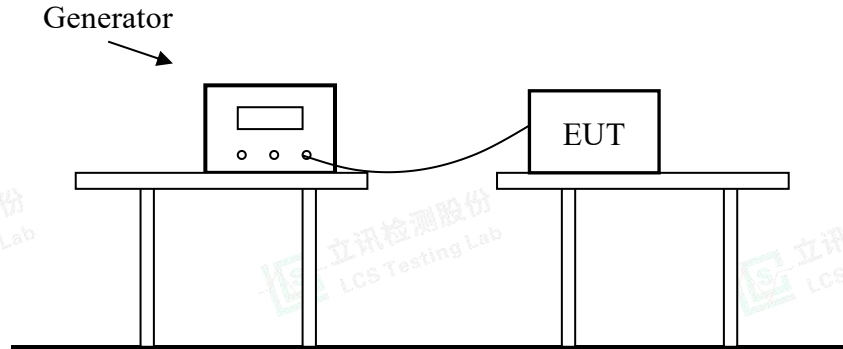
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## 4.12. Voltage dips and interruptions test

### 4.12.1. Block Diagram of Test Setup



### 4.12.2. Test Standard

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

### 4.12.3. Severity Levels and Performance Criterion

#### 4.12.3.1. Severity level

Test Level (%UT)	Voltage dip and short interruptions (%UT)	Duration (in period)
0	100	0.5
70	30	10

#### 4.12.3.2. Performance criterion: B&C

### 4.12.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.13&3.14.

### 4.12.5. Operating Condition of EUT

4.12.5.1. Setup the EUT as shown in Section 4.12.1.

4.12.5.2. Turn on the power of all equipments.

4.12.5.3. Let the EUT work in test mode (1) and measure it.

### 4.12.6. Test Procedure

4.12.6.1. Set up the EUT and test generator as shown on Section 4.12.1.





4.12.6.2.The interruptions is introduced at selected phase angles with specified duration.

4.12.6.3.Record any degradation of performance.

#### 4.12.7.Test Results

**PASS.**

Please refer to the following page.





## Voltage Dips And Interruptions Test Results

<b>Standard</b>	<input type="checkbox"/> IEC 61000-4-11 <input checked="" type="checkbox"/> EN 61000-4-11		
<b>Applicant</b>	JM Zengge Co.,Ltd		
<b>EUT</b>	LED Ceiling Light	<b>Temperature</b>	24.6°C
<b>M/N</b>	ZJ-BWCLAH-RGBWW-R12C2	<b>Humidity</b>	54.2%
<b>Test Mode</b>	Mode 1	<b>Criterion</b>	B&C
<b>Test Engineer</b>	Taylor Hu		

Test Level % U <sub>T</sub>	Voltage Dips & Short Interruptions % U <sub>T</sub>	Duration (in periods)	Criterion	Result
0	100	0.5P	B	PASS
70	30	10P	C	PASS

Note:



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## 5. PHOTOGRAPH

### 5.1. Photo of Power Line Conducted Measurement



### 5.2. Photo of Radiated Electromagnetic Disturbance Measurement



### 5.3. Photo of Radiated Measurement



### 5.4. Photo of Harmonic & Flicker Measurement



### 5.5. Photo of Radio-frequency, Continuous radiated disturbance



### 5.6. Photo of Electrostatic Discharge Test

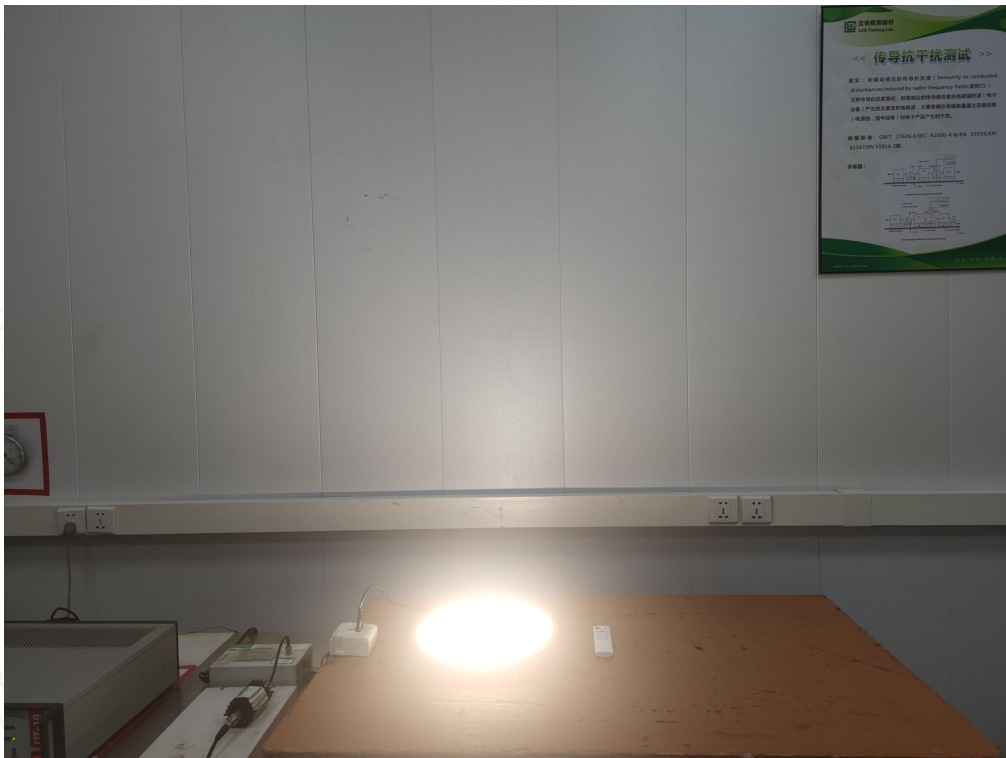




### 5.7. Photo of Electrical Fast Transient/Burst Test & Surge Immunity Test



### 5.8. Photo of Injected Currents Susceptibility Test





### 5.9. Photo of Voltage Dips and Short Interruptions Immunity Test





## 6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Please refer to separated files Appendix C for Photographs of The EUT.

----- THE END OF TEST REPORT -----



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