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## EMC Test report for 5LED LIGHT

**Models: MO8110**

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DEKRA Testing and Certification (Shanghai) Ltd.

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DOCUMENT

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## **1 CONCLUSION**

The tests described in this report do not result in the right to use any approval mark as conferred by DEKRA. As far as the tests were based on certain specifications, these are mentioned in the report.

The conclusion and results stated in this test report are based on a non-recurrent examination of sample(s) provided by the applicant.

### **1.1 Model description**

The apparatus as supplied for the test is 5 LED LIGHT, model MO8110 intended for residential use.

According to the declaration from manufacturer, all the models are identical except the ratings and appearance.



Figure 1 Overview for model MO8110

## 2 SUMMARY

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

### 2.1 Applied standards

Standard	Year	Title
EN 55014-1	2006	Emission – Electrical motor-operated and thermal appliances for household and similar purposes, electrical tools and similar electrical apparatus
A1	2009	
A2	2011	
EN 55014-2	1997	Immunity - Household appliances, electric tools and similar
A1	2001	
A2	2008	
EN 55015	2013	Emission – Electrical lighting and similar equipment
EN 61547	2009	Immunity – Equipment for general lighting purposes

### 2.2 Overview of results

Emission tests	Result
Mains conducted disturbance voltage	<b>N/A*</b>
Radiated Magnetic Field emission	<b>PASS</b>
Radiated disturbance	<b>PASS</b>

Immunity tests	Result
Electrostatic Discharges (ESD)	<b>PASS</b>
Radiated EM Field	<b>PASS</b>
Electrical fast transient (EFT)	<b>N/A*</b>
Surge transients	<b>N/A*</b>
Conducted RF disturbances	<b>N/A*</b>
Power supply voltage interruptions & dips	<b>N/A*</b>

Note\*: The equipment is powered by battery without connecting the mains.

### 3 GENERAL INFORMATION

#### 3.1 Product Information

Equipment under test	5 LED LIGHT
Trade mark	--
Tested Types	MO8110
Ratings	6 V

#### 3.2 Customer Information

Applicant	Mid Ocean Brands B.V.
Address	Unit 201, 2/F., Laford Centre, 838 Lai Chi Kok Road, Cheung Sha Wan, Kowloon, Hong Kong.

### 3.3 Test data

For Radiated disturbance and Radiated EM Field immunity tests:

Location	QuieTek Technology (Suzhou) Co., Ltd.
Address	No. 99, Hongye Road, Suzhou Industrial Park Loufeng Hi-New-Tech Development Area, Suzhou City, China
Date	Apr. 2016
Supervised by	Richie Tang

For other tests:

Location	DEKRA Testing and Certification (Shanghai) Ltd.
Address	3 F., No. 250, Jiangchangsan Road, Shanghai, China
Date of receipt of test item	Apr. 2016 (samples provided by applicant)
Date (s) of performance of tests	Apr. 2016
Supervised by	Richie Tang

### 3.4 Environmental conditions

Tests have been performed in a controlled laboratory environment, where the environmental conditions are maintained within the applicable ranges.

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

### 3.5 Measurement Uncertainty

Radiated Magnetic Field emission Expanded Uncertainty: U = 2.88 dB

Radiated Emission Expanded Uncertainty (30-300MHz):

U = 3.70 dB (horizontal)

U = 4.23 dB (vertical)

Radiated Emission Expanded Uncertainty (300M-1000MHz):

U = 3.20 dB (horizontal)

U = 3.23 dB (vertical)

## 4 EMISSION TEST RESULTS

### 4.1 Radiated Magnetic Field emission

Standard	EN 55015
Port	Enclosure with cabling
Mode	On mode

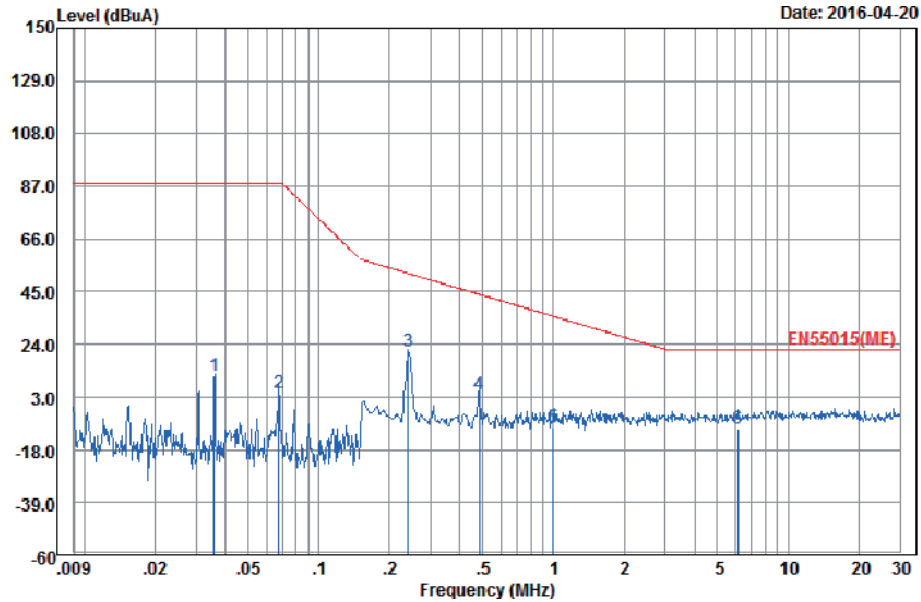
Frequency [MHz]	QP [dB(μA)]
0,009 – 0,07	88
0,07 – 0,15	88 – 58 *)
0,15 – 3,0	58 – 22 *)
3,0 – 30,0	22

\*) Limits decreasing linearly with the logarithm of the frequency



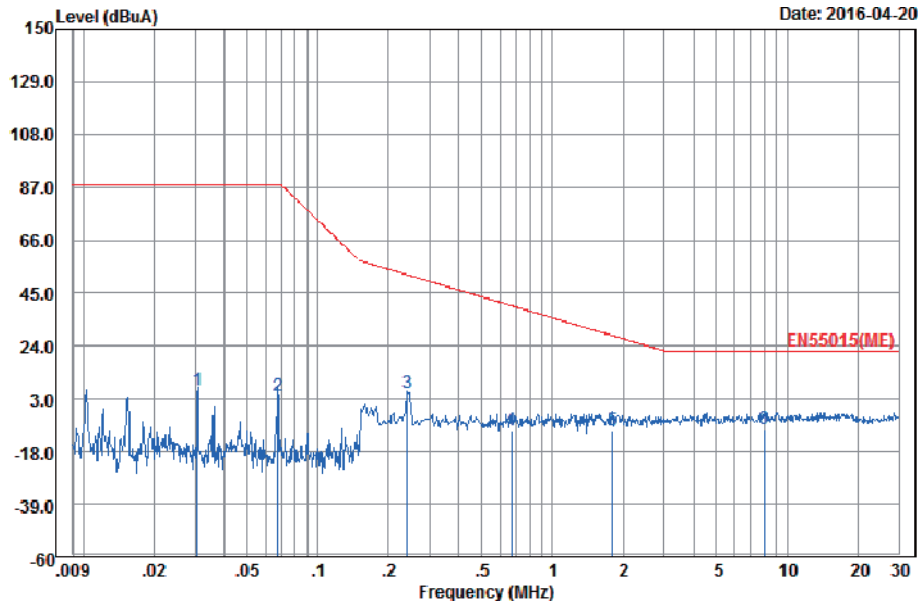
**Results for model AT3329**

**X Axis**



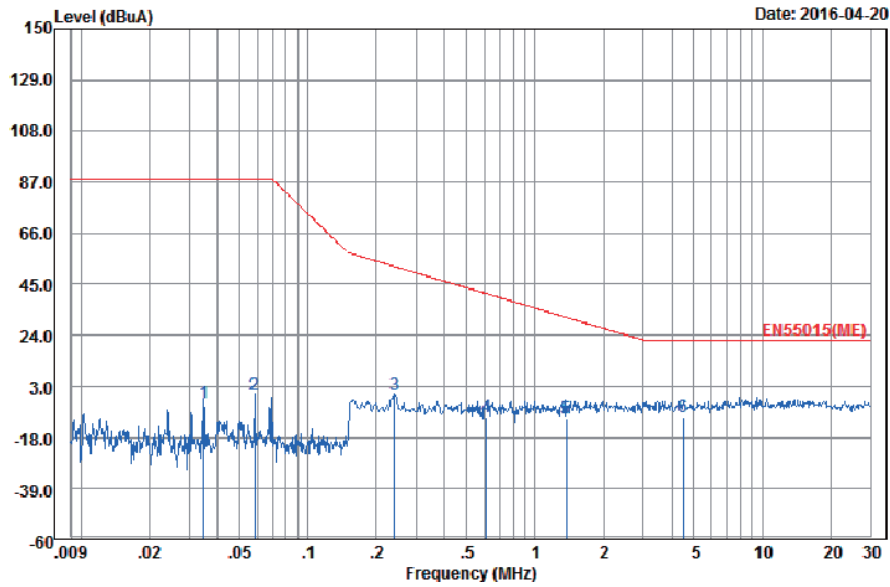
	Limit	Read	Cable	Over	Remark
Freq	Line	Level	Loss	Limit	
MHz	dBuA	dBuA	dB	dB	
1	88.00	11.50	-23.48	34.98	1.00 -76.50 QP
2	88.00	4.83	-30.28	35.11	1.13 -83.17 QP
3 pp	52.33	21.40	-13.68	35.08	1.10 -30.93 QP
4	43.93	4.10	-30.98	35.08	1.10 -39.83 QP
5	35.21	-9.00	-44.28	35.28	1.30 -44.21 QP
6	22.00	-9.67	-44.98	35.31	1.33 -31.67 QP

Y Axis



	Limit Freq	Limit Line	Read Level	Read Level	Cable Factor	Cable Loss	Over Limit	Remark
	MHz	dBuA	dBuA	dBuA	dB	dB	dB	
1	0.03	88.00	6.10	-28.88	34.98	1.00	-81.90	QP
2	0.07	88.00	3.83	-31.28	35.11	1.13	-84.17	QP
3	0.24	52.33	5.10	-29.98	35.08	1.10	-47.23	QP
4	0.67	40.05	-9.90	-45.08	35.18	1.20	-49.95	QP
5	1.80	28.14	-9.92	-45.28	35.36	1.38	-38.06	QP
6 pp	7.98	22.00	-8.93	-44.28	35.35	1.37	-30.93	QP

Z Axis



	Limit Freq	Limit Line	Read Level	Read Level	Cable Factor	Over Limit	Remark
	MHz	dBuA	dBuA	dBuA	dB	dB	dB
1	0.03	88.00	-3.90	-38.88	34.98	1.00	-91.90 QP
2	0.06	88.00	-0.43	-35.48	35.05	1.07	-88.43 QP
3	0.24	52.33	-0.60	-35.68	35.08	1.10	-52.93 QP
4	0.61	41.19	-9.60	-44.78	35.18	1.20	-50.79 QP
5	1.37	31.45	-10.05	-45.38	35.33	1.35	-41.50 QP
6 pp	4.48	22.00	-9.39	-44.68	35.29	1.31	-31.39 QP

Refer to chapter 6 for the test set-up.

Conclusion:

**PASS**

## 4.2 Radiated disturbance

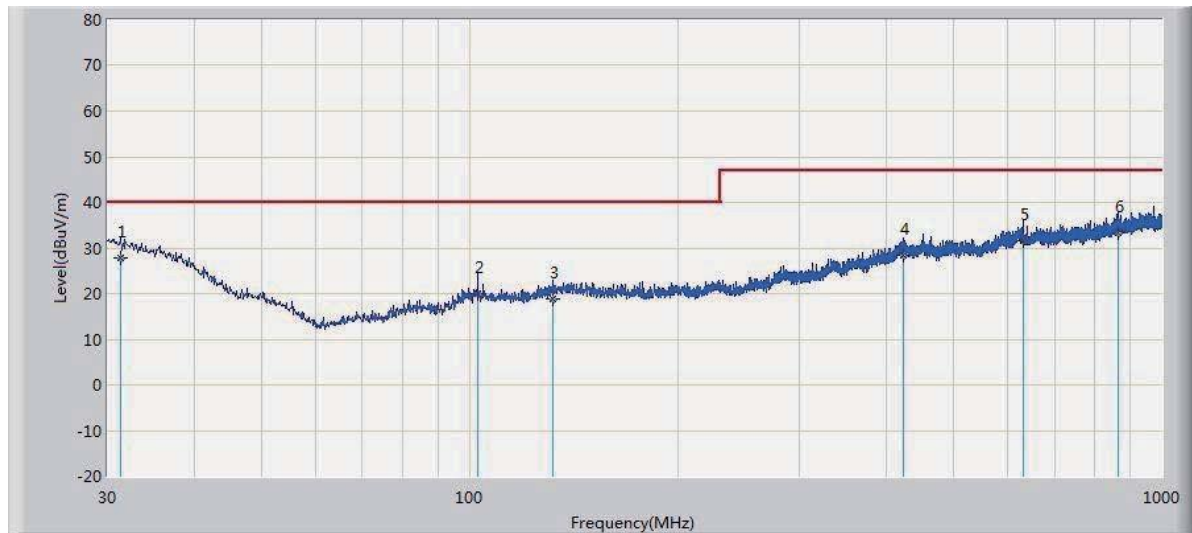
Standard	EN 55015
Measuring distance	3 meters

Frequency [MHz]	QP [dB( $\mu$ V/m)] @ 3m
30 – 230	40
230 – 1000	47

Port	Enclosure
Mode	On mode

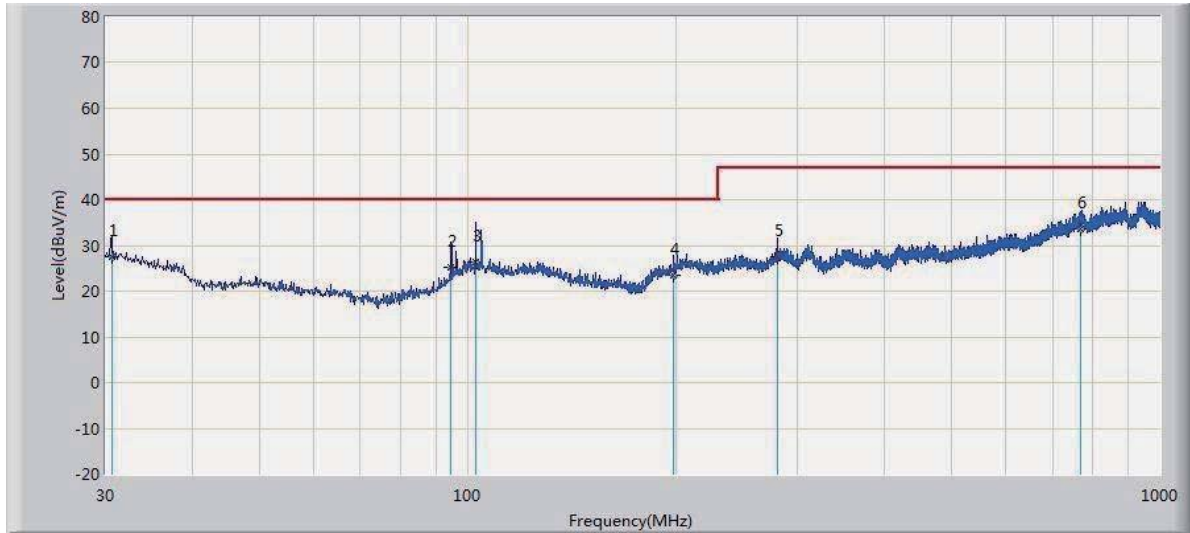
**Results for model AT3329**

**Horizontal**



Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Antenna (dB)	Ant Pos (cm)	Table Pos (deg)	Type
31.334	27.882	0.700	-12.118	40.000	20.720	6.462	0.000	100	130	QP
102.753	20.137	3.600	-19.863	40.000	9.669	6.867	0.000	200	120	QP
131.971	18.811	1.400	-21.189	40.000	10.409	7.001	0.000	100	172	QP
424.062	28.485	1.100	-18.515	47.000	19.416	7.968	0.000	100	85	QP
630.794	31.711	2.300	-15.289	47.000	20.910	8.502	0.000	100	317	QP
864.206	33.403	1.600	-13.597	47.000	22.775	9.028	0.000	100	156	QP

**Vertical**



Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Ant (dB)	Ant Pos (cm)	Table Pos (deg)	Type
30.606	27.610	3.700	-12.390	40.000	17.452	6.458	0.000	100	360	QP
94.747	25.118	5.200	-14.882	40.000	13.093	6.825	0.000	100	252	QP
102.759	26.376	4.300	-13.624	40.000	15.209	6.867	0.000	100	324	QP
198.538	23.406	1.200	-16.594	40.000	14.923	7.283	0.000	200	177	QP
280.017	27.410	2.800	-19.590	47.000	17.059	7.551	0.000	100	127	QP
768.776	33.615	1.300	-13.385	47.000	23.499	8.815	0.000	100	112	QP

Refer to chapter 6 for the test set-up.

**Conclusion:**

**PASS**

## 5 IMMUNITY TEST RESULTS

### 5.1 Electrostatic discharge immunity

Electrostatic discharges (ESD) are the result of persons or objects that accumulate static electricity due to for instance walking on synthetic carpets. The ESD can influence the operation of equipment or damage its electronics, either by a direct discharge or indirectly by coupling or radiation. Both effects are simulated during the tests.

#### Requirements

Standard	EN 61547
Basic standard	EN 61000-4-2
Port	Enclosure
Performance criterion	B; During the test degradation is allowed. No change of operating state or stored data is allowed.
Air discharges	8 kV
Contact discharges	4 kV
Mode	On mode

#### Performed tests

Air discharges		4 kV	✓	8 kV		15 kV		kV
Contact discharges		2 kV	✓	4 kV		8 kV		kV
Via coupling planes	✓	Horizontal			✓	Vertical		
Polarity	✓	Positive			✓	Negative		
Set-up	✓	Table-top				Floor standing		
Ambient temperature	22 °C							
Relative Humidity air	45%							

#### Observations

During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.

#### Conclusion:

**PASS**

## 5.2 Radiated EM field immunity

During the test it is verified if the equipment under test has sufficient immunity against radiated electromagnetic fields. Walkie-talkies, radio transmitters, television transmitters and telecommunication equipment including cellular telephones and other emitting devices like industrial electromagnetic sources can generate these fields.

### Requirements

Standard	EN 61547
Basic standard	EN 61000-4-3
Port	Enclosure
Performance criterion	A; Operation as intended
Frequency range	80 - 1000 MHz
Modulation	1 kHz – 80% AM
Field strength	3 V/m

### Performed tests

Frequency range	80 - 1000 MHz
Tested Field strength	3 V/m
Dwell time	3 seconds
Test set-up	Full Anechoic Chamber
Mode	On mode

### Observations

During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.

### Conclusion:

# PASS



## 6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

The photographs show the tested device.



Figure 3 Radiated Magnetic Field emission test setup



Figure 4 Radiated disturbance test setup

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