

EMC TEST REPORT for AOK LED Light Company Limited

LED High Bay Light

Model No.: AOK-60WoH-NV-X-0(B), AOK-100WoH-NV-X-0(B), AOK-150WoH-NV-X-0(B), AOK-200WoH-NV-X-0(B), AOK-240WoH-NV-X-0(B) ("X" can be L3, L5, O3, O5 and N3 which stands for different LEDs type; when X=L3, stands for LED type is LUXEON 3030 2D; when X=L5, stands for LED type is LUXEON 5050; when X=O3, stands for LED type is GW PSLR31.PM; when X=O5, stands for LED type is GW P9LR31.EM 5050; when X=N3, stands for LED type is NICHIA 3030. "B" can be B0 and B1 which stands for different light type; when Y=B0, stands for light from front; when Y=B1, stands for light from front and light from back.)

Applicant : AOK LED Light Company Limited

East of third floor, Building 1, St George's Industrial Park, Shajing street, Baoan District, Shenzhen, China (Second floor,

Building 4, St George's Industrial Park)

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited

Address : 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road,

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Report Number : R0117080084E

Date of Test : Aug. 26~Nov. 20, 2017

Date of Report : Nov. 20, 2017



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TEST REPORT VERIFICATION

Applicant AOK LED Light Company Limited Manufacturer **AOK LED Light Company Limited**

EUT LED High Bay Light

Model No. AOK-60WoH-NV-X-0(B), AOK-100WoH-NV-X-0(B),

AOK-150WoH-NV-X-0(B), AOK-200WoH-NV-X-0(B),

AOK-240WoH-NV-X-0(B)

("X" can be L3, L5, O3, O5 and N3 which stands for different LEDs type; when X=L3, stands for LED type is LUXEON 3030 2D; when X=L5, stands for LED type is LUXEON 5050; when X=O3, stands for LED type is GW PSLR31.PM; when X=O5, stands for LED type is GW P9LR31.EM 5050; when X=N3, stands for LED type is

NICHIA 3030.

"B" can be B0 and B1 which stands for different light type; when Y=B0, stands for light from front; when Y=B1, stands for light from

front and light from back.)

Rating 100-240VAC, 50/60Hz,

See Chapter 1.7 for model list

Trade Mark

Measurement Procedure Used: AS/NZS CISPR 15: 2011

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels em anating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the AS/NZS CISPR 15 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited

Date of Test: Aug. 26~Nov. 20, 2017 hanon Wen Prepared by: (Engineer/ Baron Wen) Reviewer: (Project Manager/ Oliay Yang)

Approved & Authorized Signer: (Manager/ Tom Chen)



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : LED High Bay Light

Model Number : AOK-60WoH-NV-X-0(B), AOK-100WoH-NV-X-0(B),

AOK-150WoH-NV-X-0(B), AOK-200WoH-NV-X-0(B),

AOK-240WoH-NV-X-0(B)

("X" can be L3, L5, O3, O5 and N3 which stands for different LEDs type; when X=L3, stands for LED type is LUXEON 3030 2D; when X=L5, stands for LED type is LUXEON 5050; when X=O3, stands for LED type is GW PSLR31.PM; when X=O5, stands for LED type is GW P9LR31.EM 5050; when X=N3,

stands for LED type is NICHIA 3030.

"B" can be B0 and B1 which stands for different light type; when Y=B0, stands for light from front; when Y=B1, stands for

light from front and light from back.)

(Note: All samples are the same except the model number & appearance, so we prepare "AOK-240WoH-NV-L3-0(B0)" for

EMC test only.)

Test Power Supply: AC 240V, 50Hz

Applicant : AOK LED Light Company Limited

East of third floor, Building 1, St George's Industrial Park, Shajing street, Baoan District, Shenzhen, China (Second floor,

Building 4, St George's Industrial Park)

Manufacturer : AOK LED Light Company Limited

Address : East of third floor, Building 1, St George's Industrial Park,

Shajing street, Baoan District, Shenzhen, China (Second floor,

Building 4, St George's Industrial Park)

Factory : AOK LED Light Company Limited

Address : East of third floor, Building 1, St George's Industrial Park,

Shajing street, Baoan District, Shenzhen, China (Second floor,

Building 4, St George's Industrial Park)



1.2. Auxiliary Equipment Used during Test

N/A

1.3. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111, July 31, 2017.

ISED-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A-1, June 13, 2016.

Test Location

All Emissions tests were performed:

Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.1dB (Horizontal)

Ur = 4.3dB (Vertical)

Conduction Uncertainty : Uc = 3.4dB

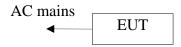
Magnetic Uncertainty : Um = 3.3dB



1.5. Description of Test Mode

Pretest Mode	Description
Mode 1	On

For Mode 1 Block Diagram of Test Setup



1.6. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test (9kHz To 30MHz)	Mode 1	P
Radiated Emission Test (30MHz To 300MHz)	Mode 1	Р
Magnetic Radiated emission Test (9KHz To 30MHz)	Mode 1	P

- P) Indicates that the through the test.
- N) Don't test.



1.7. Model List

Model No.	Input power (W)	LED driver	Dimension
AOK-60WoH-NV-X-0(B)	60W	HBG-100-48B	Ф248*138
AOK-100WoH-NV-X-0(B)	100W	HBG-100-48B	Ф248*138
AOK-150WoH-NV-X-0(B)	150W	HBG-160-48B	Ф319*138
AOK-200WoH-NV-X-0(B)	200W	HBG-200-48B	Ф400*141
AOK-240WoH-NV-X-0(B)	240W	HBG-240-48B	Ф400*141

Remark:

"X" can be L3, L5, O3, O5 and N3 which stands for different LEDs type; when X=L3, stands for LED type is LUXEON 3030 2D; when X=L5, stands for LED type is LUXEON 5050; when X=O3, stands for LED type is GW PSLR31.PM; when X=O5, stands for LED type is GW P9LR31.EM 5050; when X=N3, stands for LED type is NICHIA 3030.

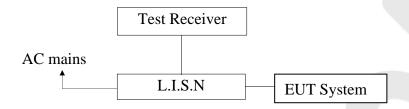
"B" can be B0 and B1 which stands for different light type; when Y=B0, stands for light from front; when Y=B1, stands for light from front and light from back.



2. CONDUCTED EMISSION TEST

2.1. Block Diagram of Test Setup

2.1.1. Block diagram of connection between the EUT and simulators



2.2. Measuring Standard

AS/NZS CISPR 15

2.3. Power Line Conducted Emission Limits

Frequency	At mains terminals (dBµV)			
requency	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.

2.4. EUT Configuration on Measurement

The following equipments are installed on conducted emission measurement to meet AS/NZS CISPR 15 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

2.5. Operating Condition of EUT

- 2.5.1. Setup the EUT as shown on Section 3.1.
- 2.5.2. Turn on the power of all equipments.
- 2.5.3. Let the EUT work in measuring mode and measure it.



2.6. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the AS/NZS CISPR 15 regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 9kHz in 150kHz~30MHz.

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

The test results are listed in Section 2.8.

2.7. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	May 27, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	May 27, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 27, 2017	1 Year
4.	Software Name EZ-EMC	Ferrari Tcchnology	ANB-03A	N/A	N/A	N/A

2.8. Measuring Results

PASS

The frequency range 9kHz to 30MHz is investigated.

The test curves are shown in the following pages.

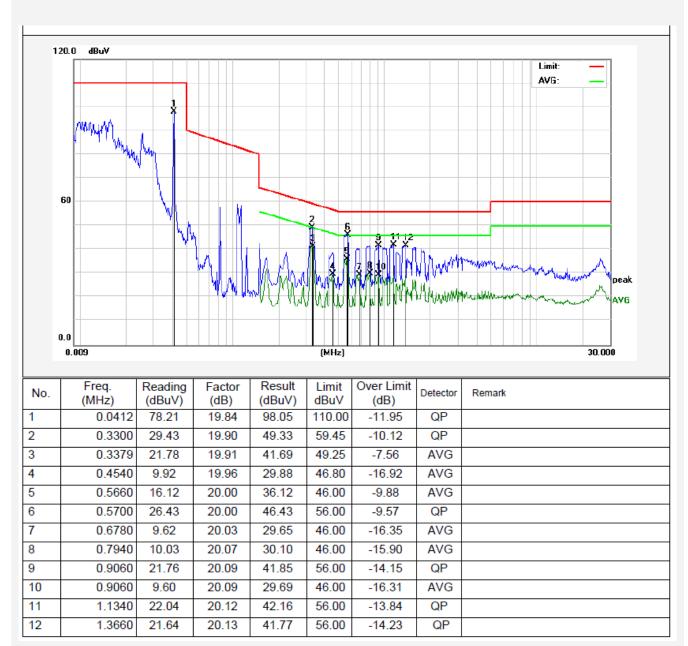


CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
Test Specification: AC 240V, 50Hz

Comment: L

Tem.: 22.2℃ Hum.: 60%



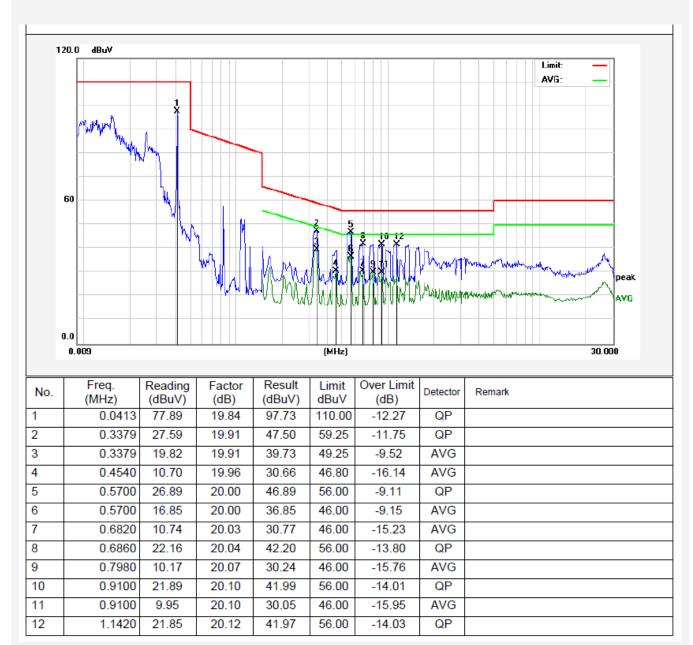


CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
Test Specification: AC 240V, 50Hz

Comment: N

Tem.: 22.2℃ Hum.: 60%

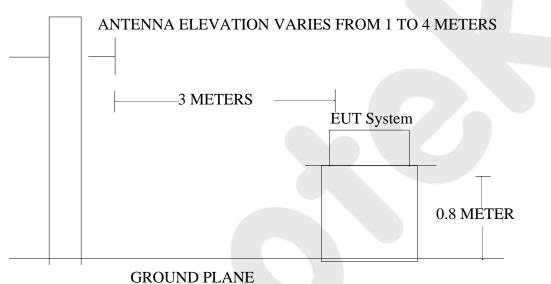




3. RADIATED EMISSION TEST

3.1. Block Diagram of Test

3.1.2. Block diagram of test setup (In chamber)



3.2. Measuring Standard

AS/NZS CISPR 15

3.3. Radiated Emission Limits

All emanations from a CISPR 15 device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

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

Note:

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

3.4. EUT Configuration on Test

The AS/NZS CISPR 15 regulations test method must be used to find the maximum



emission during radiated emission measurement.

3.5. Operating Condition of EUT

- 3.5.1. Turn on the power.
- 3.5.2. Let the EUT work in test mode and measure it.

3.6. Test Procedure

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

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

The EUT is tested in 9*6*6 Chamber.

The test results are listed in Section 3.8.

3.7. Test Equipment

The following test equipments are used during radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	May 27, 2017	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 31, 2017	1 Year
3.	Pre-amplifier	SONOMA	310N	186860	May 27, 2017	1 Year
4.	Software Name EZ-EMC	Ferrari Tcchnology	ANB-03A	N/A	N/A	N/A

3.8. Measuring Results

PASS

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

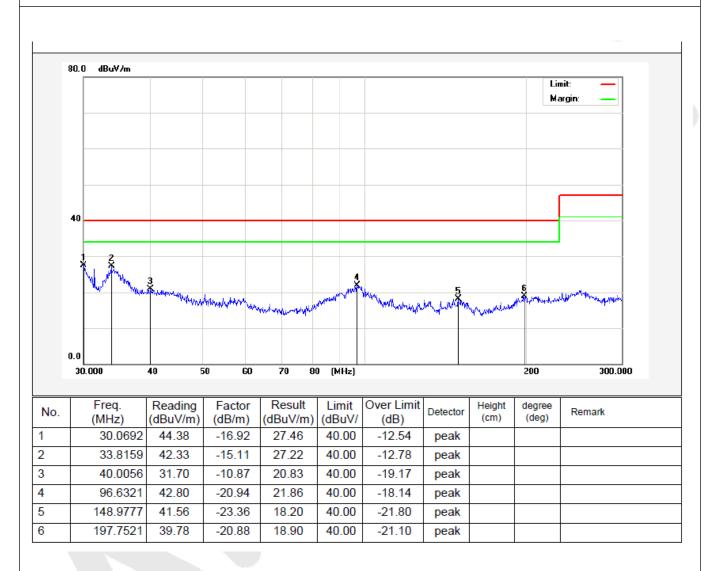
Test data see the following pages.



Test item: Radiation Test Palarization: Horizontal

Standard: (RE)AS/NZS CISPR 15 Power Source: AC 240V, 50Hz

Distance: 3m Temp.(℃)/Hum.(%RH): 24.3(℃)/55%RH

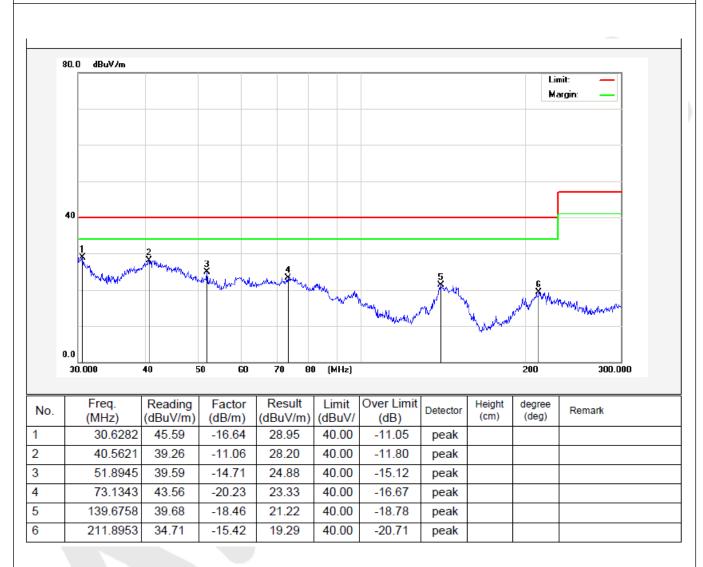




Test item: Radiation Test Palarization: Vertical

Standard: (RE)AS/NZS CISPR 15 Power Source: AC 240V, 50Hz

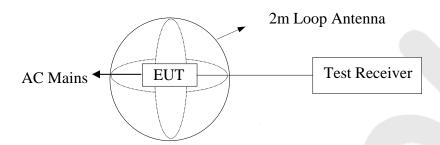
Distance: 3m Temp.(℃)/Hum.(%RH): 24.3(℃)/55%RH





4. MAGNETIC RADIATED EMISSION TEST

4.1. Block Diagram of Test Setup



4.2. Magnetic Field Emission Measurement Standard and Limits

4.2.1. Measuring Standard

AS/NZS CISPR 15

4.2.2. Measuring Limits

Frequency	Limits for loop diameter (dBµA)
Trequency	2m
9KHz ~ 70KHz	88
70KHz ~ 150KHz	88 ~ 58*
150KHz ~ 3MHz	58 ~ 22*
3MHz ~ 30MHz	22

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

4.3. EUT Configuration on Measurement

The following equipments are installed on magnetic radiated emission measurement to meet AS/NZS CISPR 15 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

4.4. Operating Condition of EUT

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

4.5. 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 test receiver (ESCI) is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz.

All the test results are listed in Section 4.7.

4.6. Test Equipment

The following test equipments are used during the Magnetic Radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	May 27, 2017	1 Year
2.	Triple-Loop Antenna(2M)	EVERFINE	LLA-2	905003	May 27, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 27, 2017	1 Year
4.	Software Name EZ-EMC	Ferrari Tcchnology	ANB-03A	N/A	N/A	N/A

4.7. Measuring Results

PASS

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

Test data see the following pages.

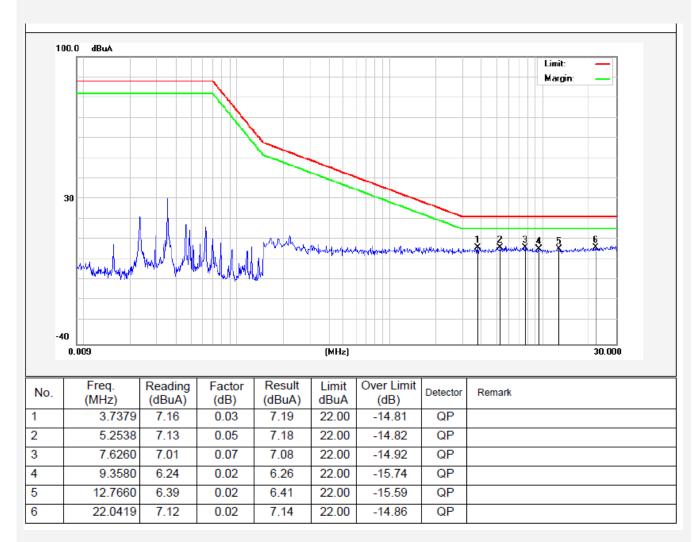


MAGNETIC RADIATED EMISSION TEST

Test Site: 1# Shielded Room
Test Specification: AC 240V, 50Hz

Comment: X

Tem.: 22.2℃ Hum.: 59%



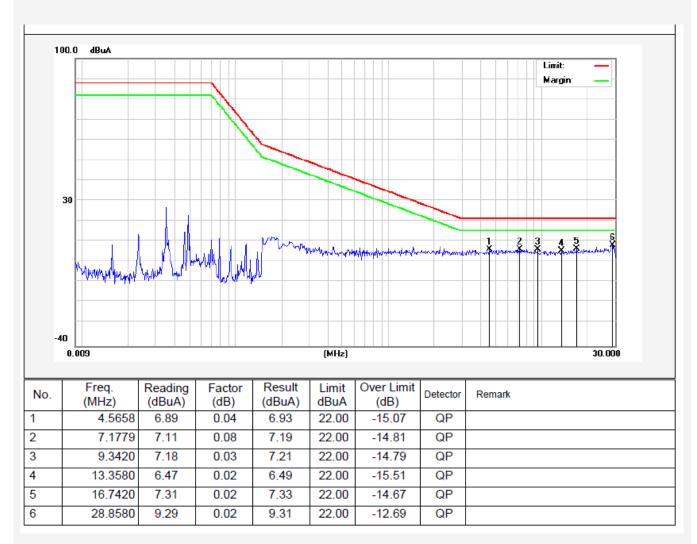


MAGNETIC RADIATED EMISSION TEST

Test Site: 1# Shielded Room
Test Specification: AC 240V, 50Hz

Comment: Y

Tem.: 22.2℃ Hum.: 59%



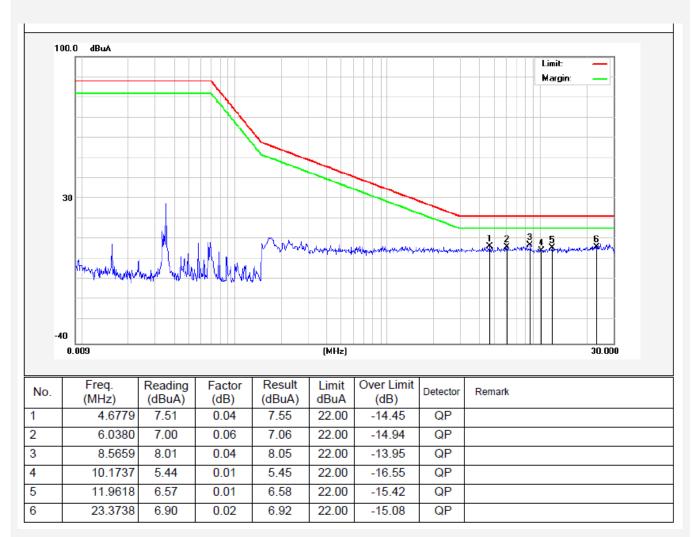


MAGNETIC RADIATED EMISSION TEST

Test Site: 1# Shielded Room
Test Specification: AC 240V, 50Hz

Comment: Z

Tem.: 22.2℃ Hum.: 59%



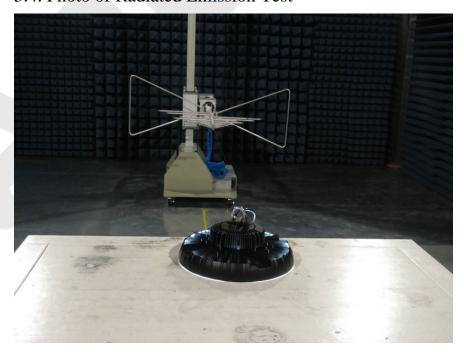


5. PHOTOGRAPH



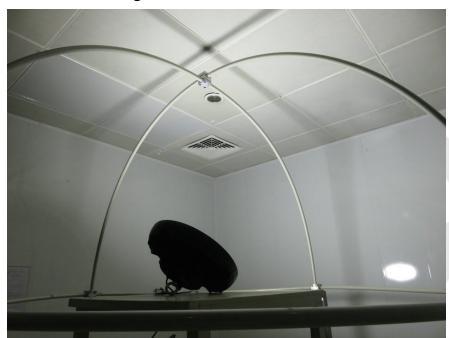


5.4. Photo of Radiated Emission Test





5.7. Photo of Magnetic Radiated Emission Test





APPENDIX I (Photos of EUT)



Figure 1 The EUT- Top View (Model: AOK-100WoH-NV-L3-0(B0))



Figure 2 The EUT- Bottom View (Model: AOK-100WoH-NV-L3-0(B0))





Figure 3
The EUT- Inside View (Model: AOK-100WoH-NV-L3-0(B0))



Figure 4
The EUT- Top View (Model: AOK-150WoH-NV-L3-0(B0))

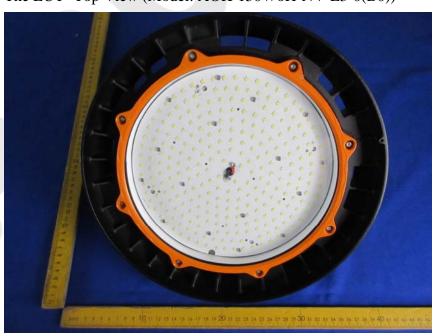




Figure 5
The EUT- Bottom View (Model: AOK-150WoH-NV-L3-0(B0))



Figure 6
The EUT- Inside View (Model: AOK-150WoH-NV-L3-0(B0))





Figure 7
The EUT- Top View (Model: AOK-240WoH-NV-L3-0(B0))



Figure 8 The EUT- Bottom View (Model: AOK-240WoH-NV-L3-0(B0))







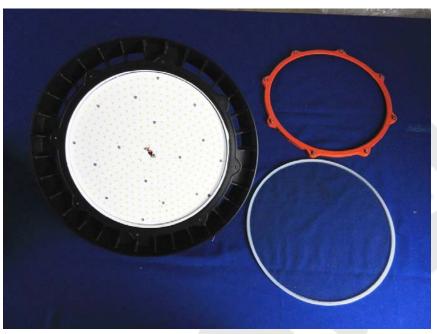


Figure 10 Internal view for all models



----- End of Report -----