



TEST REPORT

Kunde: <i>Client:</i>	AOK Industrial Company Limited
Adresse: <i>Address:</i>	1/F of 1#Building, East Block of 3/F of Building 1, And 2/F of Building 4, ST George's Science and Technology Industrial Park, Northside of Xinyu Road, Xiangshan Community, Xianqiao Street Baoan District, 518000 Shenzhen, Guangdong, CHINA
Hersteller: <i>Manufacturer:</i>	AOK Industrial Company Limited
Adresse: <i>Address:</i>	1/F of 1#Building, East Block of 3/F of Building 1, And 2/F of Building 4, ST George's Science and Technology Industrial Park, Northside of Xinyu Road, Xiangshan Community, Xianqiao Street Baoan District, 518000 Shenzhen, Guangdong, CHINA
Name der Marke: <i>Brand Name:</i>	AOK
Beschreibung des Produkts: <i>Product Description:</i>	LED STADIUM LIGHT
Modelle: <i>Models:</i>	AOK-1200WISF-NV-00-S35-4080-20-U
Bewertung: <i>Rating:</i>	100-277V~, 50/60Hz, 1200W
Verfahren: <i>Method:</i>	According to requirement clause 12.4.1 of AS/NZS 60598.1: 2017+A1:2017+A2: 2020;AS/NZS 60598.2.5:2018;(also reference IEC 60598-1)
Prüfergebnis*: <i>Test result*:</i>	Pass

Datum der Prüfung:
Date of Test:

2022/12/29~2023/1/5

Datum der Emission:
Date of Issue:

2023/1/11

Klassifizierung:
Classification:

Commission Test

Gegenstand der Prüfung:
Test item:

ISTMT+TM21 Test

Prüflabor (Testlabor) / Testing Laboratory:
Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Test von/Test by:

Rebecca Qin

Rebecca Qin/ Project Engineer

Check von/Check by:

Torres He

Torres He/ Director

Genehmigt von/Approved by:

Jesse Liu

Jesse Liu/ Manager

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Scan code to check authenticity



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3. The general information of applicant and manufacturer (such as the name and address), product name, model/type reference, trademark and other similar information contained in this report are all provided by the applicant, the laboratory is not responsible for verifying its authenticity.

Modified Information

Version	Report No.	Revision Date	Summary
000	LCSB111822016S	--	Original Version

4. "(See attachment#)" refers to additional information appended to the report.
5. "(See remark#)" refers to a remark appended to the report.
6. "(See appended table)" refers to a table appended to the report.
7. Throughout this report a comma (point) is used as the decimal separator.





1. GENERAL INFORMATION

1.1 Product Information

Information of product:	
Product description	LED STADIUM LIGHT
Model Number	AOK-1200WISF-NV-00-S35-4080-20-U
Rated Inputs	100-277V~, 50/60Hz
LED driver model	EUM-680S560MG
Manufacturer of LED driver	INVENTRONICS
Rated Power	1200W
Declared CCT.	4000K
LED Package, Array or Module	2*(5P50S+2); 504pcs LED chip(s)
Date of Receipt Samples	2022/12/29
Quantity of Receipt Samples	1 unit
Information of LED chip:	
LED Chip Manufacturer	Seoul Semiconductor Co., LTD
LED type	3535
Model of the LED chip(s)	SZ5-M4-WW-C7
Forward voltage of the LED chip	2.95V
Forward current of the LED chip	1050mA
ISTMT temperature of the LED chip	105°C
IES LM-80 Test Report	Report Number: I-191002-119-I-06 Issue Date: December 27, 2021 Tested and Prepared By: Seoul Semiconductor Testing Laboratory



**Remark:**

1. Measurement was conducted at a stable ambient temperature $45^{\circ}\text{C}\pm 1^{\circ}\text{C}$ and voltage 230Vac, 50Hz
2. The ISTMT was performed with the cover installed on the LED package and the luminaire was installed according to actual use of the installation status.
- 3..Detail information for models covered in this report as below.

Model list:

Model No.	CCT	Rating	Driver
AOK-1200WISF-NV-00-S35-4080-20-U	4000K	100-277V~, 50/60Hz, 1200W	EUM-680S560M (2pcs)

LED specification:

Model/Series	Manufacturer	V_F (V)	I_F (mA)
SZ5-M4-WW-C7	Seoul Semiconductor Co., LTD	2.95V	1050mA





1.2 Reference Standards or Methods

According to requirement clause 12.4.1 of AS/NZS 60598.1: 2017+A1:2017+A2:2020;

AS/NZS 60598.2.5:2018;(also reference IEC 60598-1)

IES LM-84-14: Measuring Luminous Flux and Color Maintenance of LED Lamps, Light Engines, and Luminaires---Annex A: measurement of in-situ conditions LED case temperature.

1.3 Equipment list

Item	Equipment No.	Equipment	Manufacturer/Type	Cal.Date	Due Date
1	SLCS-S-004	Digital Power Meter	YOKOGAWA/ WT210 / 91L424211	2022.5.10	2023.5.9
2	SLCS-S-011	Thermocouple	DE AO/J	2022.5.10	2023.5.9
3	SLCS-S-036	Temperature recorder	AGILENT/ 34970A	2022.5.10	2023.5.9

2. Test Result of ISTMT

2.1 Electrical data

Criteria Item	Result
Input voltage	230V
Input current	5.116A
Total power	1169W
Power factor	0.991
Current on each LED module	624.5mA
Remark: There are 504pcs LED chip(s)(2*(5P50S+2)) in models AOK-1200WISF-NV-00-S35-4080-20-U, That we are measurement the total current of driver output was 7494mA, and current on each parallel was 624.5mA(7494mA/12=624.5mA), Because in each series that the forward current on each LED chip(s) was equivalent, so forward current on each LED chip(s) was 624.5mA.	



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2.2 Temperature data

Ambient Temperature, °C :	45±1°C	Relative Humidity, % :	65%	
Supply voltage:	230 Vac / 50 Hz	Type of thermocouples:	J	
Test Product Model	AOK-1200WISF-NV-00-S35-4080-20-U			
Test LED Model	SZ5-M4-WN-C8			
Test LED Driver Model	EUM-680S560MG (2pcs)			
Number of Driver / Product	One Lamp with two power supply			
Test Duration	≥3.5Hours			
Item	Parts	Test Result (℃)	Revise to ta. (℃)	Limit (℃)
1	Measured maximum Temperature @ TEMLED	104.8	104.7	105
2	tc of LED driver	80.2	80.1	90
3	Ambient	45.1	45.0	--

3. Lumen Maintenance Projection (IESNA TM-21-11 Method)

3.1 LM-80 report summary for LED chip(s)

Manufactured by	Seoul Semiconductor Co., LTD		
LED Model	SZ5-M4-WW-C7		
Number of LED light source tested	20 units		
Drive Current	1050mA		
Case temperature	85°C	105°C	--
17000 hours lumen maintenance	98.8%	98.3%	--
17000 hours color maintenance ($\Delta u'v'$)	0.0012	0.0017	--

Test data exact from LM80 test report which generated for seoul semiconductor testing report.Report No.I-191002-119-I-06.issued date:2021-12-27.

3.2 Lumen Maintenance Projection for luminaires

Criteria Item	Result
354000h at which to estimate lumen maintenance	70.0%
Drive current on each LED light source	624.5mA
Reported L ₇₀ lumen maintenance life	>102000 hours

Criteria Item	Result
221000h at which to estimate lumen maintenance	80.05%





Drive current on each LED light source	624.5mA
Reported L ₈₀ lumen maintenance life	>102000 hours

Criteria Item	Result
104000h at which to estimate lumen maintenance	90.07%
Drive current on each LED light source	624.5mA
Reported L ₉₀ lumen maintenance life	>102000 hours





TM-21 Inputs

Instructions

Yellow fields are completed by the user. Fields not used should be left blank. Cyan fields are calculated based on user entries.

First, enter a description of the LED light source tested. Then complete the fields labeled "LM-80 Testing Details". Test duration must be at least 6,000 hours. If only one case temperature data set is to be used (no interpolation), complete only "Tested case temperature 1". For only two case temperature data sets, complete 1 and 2.

Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data per TM-21 sections 5.2.1 and 5.2.2. If case temperatures have different test durations, enter data up to the lowest of the test durations for all of the case temperatures.

Enter drive current, *in-situ* temperature data and the percentage of initial lumens to project to in the fields labeled "In-Situ Inputs".

Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report".

Description of LED Light Source Tested
(manufacturer, model, catalog number)

Seoul Semiconductor Co., LTD
SZ5-M4-WW-C7

LM-80 Testing Details

Total number of units tested per case temperature:	20
Number of failures:	0
Number of units measured:	20
Test duration (hours):	17000
Tested drive current (mA):	1050
Tested case temperature 1 (T _c , °C):	85
Tested case temperature 2 (T _c , °C):	105
Tested case temperature 3 (T _c , °C):	

In-Situ Inputs

Drive current for each LED package/array/module (mA):	624.5
In-situ case temperature (T _c , °C):	104.7
Percentage of initial lumens to project to (e.g. for L ₇₀ , enter 70):	70

Results

Time (t) at which to estimate lumen maintenance (hours):	354,000
Lumen maintenance at time (t) (%):	70.00%
Reported L70 (hours):	>102000

LM-80 Test Inputs

Test Data for 85°C Case Temperature		Test Data for 105°C Case Temperature		Tested Case Temperature 3	
Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
1000	99.90%	1000	99.90%		
2000	99.90%	2000	99.80%		
3000	99.80%	3000	99.70%		
4000	99.70%	4000	99.60%		
5000	99.70%	5000	99.50%		
6000	99.60%	6000	99.40%		
7000	99.50%	7000	99.30%		
8000	99.40%	8000	99.20%		
9000	99.40%	9000	99.10%		
10000	99.30%	10000	99.00%		
11000	99.30%	11000	98.90%		
12000	99.20%	12000	98.80%		
13000	99.00%	13000	98.70%		
14000	99.00%	14000	98.60%		
15000	98.90%	15000	98.50%		
16000	98.90%	16000	98.40%		
17000	98.80%	17000	98.30%		



TM-21 Report

Table 1: Report at each LM-80 Test Condition					
Description of LED Light Source Tested (manufacturer, model, catalog number)		Seoul Semiconductor Co., LTD SZ5-M4-WW-C7			
		Test Condition 1 - 85°C Case Temp		Test Condition 2 - 105°C Case Temp	
Sample size	20	Sample size	20	Sample size	-
Number of failures	0	Number of failures	0	Number of failures	-
DUT drive current used in the test (mA)	1050	DUT drive current used in the test (mA)	1050	DUT drive current used in the test (mA)	-
Test duration (hours)	17,000	Test duration (hours)	17,000	Test duration (hours)	-
Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	-
Tested case temperature (°C)	85	Tested case temperature (°C)	105	Tested case temperature (°C)	-
α	7.337E-07	α	1.013E-06	α	-
B	1.000	B	1.000	B	-
Reported L70(17k) (hours)	>102000	Reported L70(17k) (hours)	>102000	Reported L70(17k) (hours)	-

Table 2: Interpolation Report (projection based on in-situ temperature entered)	
T ₈₅ (°C)	85.00
T ₈₅ (K)	358.15
α ₁	7.337E-07
B ₁	1.000
T ₈₅ (°C)	105.00
T ₈₅ (K)	378.15
α ₂	1.013E-06
B ₂	1.000
E _a /k _B	2.18E+03
A	3.244E-04
B ₀	1.000
T ₈₅ (°C)	104.70
T ₈₅ (K)	377.85
α _i	1.008E-06
Reported L70(17k) at 104.7°C (hours)	>102000



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TM-21 Inputs

Instructions

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Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data (per TM-21 sections 5.2.1 and 5.2.2). If case temperatures have different test durations, enter data up to the lowest of the test durations for all of the case temperatures.

Enter drive current, *in-situ* temperature data and the percentage of initial lumens to project to in the fields labeled "In-Situ Inputs".

Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report".

Description of LED Light Source Tested
(manufacturer, model, catalog number)

Seoul Semiconductor Co., LTD
SZ5-M4-WW-C7

LM-80 Testing Details

Total number of units tested per case temperature:	20
Number of failures:	0
Number of units measured:	20
Test duration (hours):	17000
Tested drive current (mA):	1050
Tested case temperature 1 (T _c , °C):	85
Tested case temperature 2 (T _c , °C):	105
Tested case temperature 3 (T _c , °C):	

In-Situ Inputs

Drive current for each LED package/array/module (mA):	624.5
In-situ case temperature (T _c , °C):	104.7
Percentage of initial lumens to project to (e.g. for L ₇₀ , enter 70):	80

Results

Time (t) at which to estimate lumen maintenance (hours):	221,000
Lumen maintenance at time (t) (%):	80.05%
Reported L80 (hours):	>102000

LM-80 Test Inputs

Test Data for 85°C Case Temperature		Test Data for 105°C Case Temperature		Tested Case Temperature 3	
Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
1000	99.90%	1000	99.90%		
2000	99.90%	2000	99.80%		
3000	99.80%	3000	99.70%		
4000	99.70%	4000	99.60%		
5000	99.70%	5000	99.50%		
6000	99.60%	6000	99.40%		
7000	99.50%	7000	99.30%		
8000	99.40%	8000	99.20%		
9000	99.40%	9000	99.10%		
10000	99.30%	10000	99.00%		
11000	99.30%	11000	98.90%		
12000	99.20%	12000	98.80%		
13000	99.00%	13000	98.70%		
14000	99.00%	14000	98.60%		
15000	98.90%	15000	98.50%		
16000	98.90%	16000	98.40%		
17000	98.80%	17000	98.30%		



TM-21 Report

Table 1: Report at each LM-80 Test Condition			
Description of LED Light Source Tested (manufacturer, model, catalog number)		Seoul Semiconductor Co., LTD SZ5-M4-WW-C7	
Test Condition 1 - 85°C Case Temp		Test Condition 2 - 105°C Case Temp	
Sample size	20	Sample size	20
Number of failures	0	Number of failures	0
DUT drive current used in the test (mA)	1050	DUT drive current used in the test (mA)	1050
Test duration (hours)	17,000	Test duration (hours)	17,000
Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	8,000 - 17,000
Tested case temperature (°C)	85	Tested case temperature (°C)	105
α	7.337E-07	α	1.013E-06
B	1.000	B	1.000
Reported L80(17k) (hours)	>102000	Reported L80(17k) (hours)	>102000

Table 2: Interpolation Report (projection based on in-situ temperature entered)	
T _{s1} (°C)	85.00
T _{s1} (K)	358.15
α ₁	7.337E-07
B ₁	1.000
T _{s2} (°C)	105.00
T _{s2} (K)	378.15
α ₂	1.013E-06
B ₂	1.000
E _s /K ₀	2.18E+03
A	3.244E-04
B ₀	1.000
T _{s1} (°C)	104.70
T _{s1} (K)	377.85
α ₁	1.008E-06
Reported L80(17k) at 104.7°C (hours)	>102000





TM-21 Inputs

Instructions

Yellow fields are completed by the user. Fields not used should be left blank. Cyan fields are calculated based on user entries.

First, enter a description of the LED light source tested. Then complete the fields labeled "LM-80 Testing Details". Test duration must be at least 6,000 hours. If only one case temperature data set is to be used (no interpolation), complete only "Tested case temperature 1". For only two case temperature data sets, complete 1 and 2.

Next, further to the right, in the corresponding box(es) for each tested case temperature, enter the test data along with the time (in hours) at which each measurement was taken. Data entered must be normalized then averaged measured data (per TM-21 sections 5.2.1 and 5.2.2). If case temperatures have different test durations, enter data up to the lowest of the test durations for all of the case temperatures.

Enter drive current, *in-situ* temperature data and the percentage of initial lumens to project to in the fields labeled "In-Situ Inputs".

Results can be tailored to estimate lumen maintenance at a specific time by entering a value (t) in the yellow field. A complete TM-21 report will appear on the next tab labeled "Report".

Description of LED Light Source Tested
(manufacturer, model, catalog number)

Seoul Semiconductor Co., LTD
SZ5-M4-WW-C7

LM-80 Testing Details

Total number of units tested per case temperature:	20
Number of failures:	0
Number of units measured:	20
Test duration (hours):	17000
Tested drive current (mA):	1050
Tested case temperature 1 (T _c , °C):	85
Tested case temperature 2 (T _c , °C):	105
Tested case temperature 3 (T _c , °C):	

In-Situ Inputs

Drive current for each LED package/array/module (mA):	624.5
In-situ case temperature (T _c , °C):	104.7
Percentage of initial lumens to project to (e.g. for L ₇₀ , enter 70):	90

Results

Time (t) at which to estimate lumen maintenance (hours):	104,000
Lumen maintenance at time (t) (%):	90.07%
Reported L90 (hours):	>102000

LM-80 Test Inputs

Test Data for 85°C Case Temperature		Test Data for 105°C Case Temperature		Tested Case Temperature 3	
Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
1000	99.90%	1000	99.90%		
2000	99.90%	2000	99.80%		
3000	99.80%	3000	99.70%		
4000	99.70%	4000	99.60%		
5000	99.70%	5000	99.50%		
6000	99.60%	6000	99.40%		
7000	99.50%	7000	99.30%		
8000	99.40%	8000	99.20%		
9000	99.40%	9000	99.10%		
10000	99.30%	10000	99.00%		
11000	99.30%	11000	98.90%		
12000	99.20%	12000	98.80%		
13000	99.00%	13000	98.70%		
14000	99.00%	14000	98.60%		
15000	98.90%	15000	98.50%		
16000	98.90%	16000	98.40%		
17000	98.80%	17000	98.30%		



TM-21 Report

Table 1: Report at each LM-80 Test Condition					
Description of LED Light Source Tested (manufacturer, model, catalog number)		Seoul Semiconductor Co., LTD SZ5-M4-WW-C7			
		Test Condition 1 - 85°C Case Temp		Test Condition 2 - 105°C Case Temp	
Sample size	20	Sample size	20	Sample size	-
Number of failures	0	Number of failures	0	Number of failures	-
DUT drive current used in the test (mA)	1050	DUT drive current used in the test (mA)	1050	DUT drive current used in the test (mA)	-
Test duration (hours)	17,000	Test duration (hours)	17,000	Test duration (hours)	-
Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	8,000 - 17,000	Test duration used for projection (hour to hour)	-
Tested case temperature (°C)	85	Tested case temperature (°C)	105	Tested case temperature (°C)	-
α	7.337E-07	α	1.013E-06	α	-
B	1.000	B	1.000	B	-
Reported L90(17k) (hours)	>102000	Reported L90(17k) (hours)	>102000	Reported L90(17k) (hours)	-

Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
T ₈₅ (°C)	85.00
T ₈₅ (K)	358.15
α_1	7.337E-07
B ₁	1.000
T ₈₅ (°C)	105.00
T ₈₅ (K)	378.15
α_2	1.013E-06
B ₂	1.000
E _a /k _B	2.18E+03
A	3.244E-04
B ₀	1.000
T ₈₅ (°C)	104.70
T ₈₅ (K)	377.85
α_i	1.008E-06
Reported L90(17k) at 104.7°C (hours)	>102000





4. Photos

4.1 Thermocouple contact photo of @TEM_{LED}

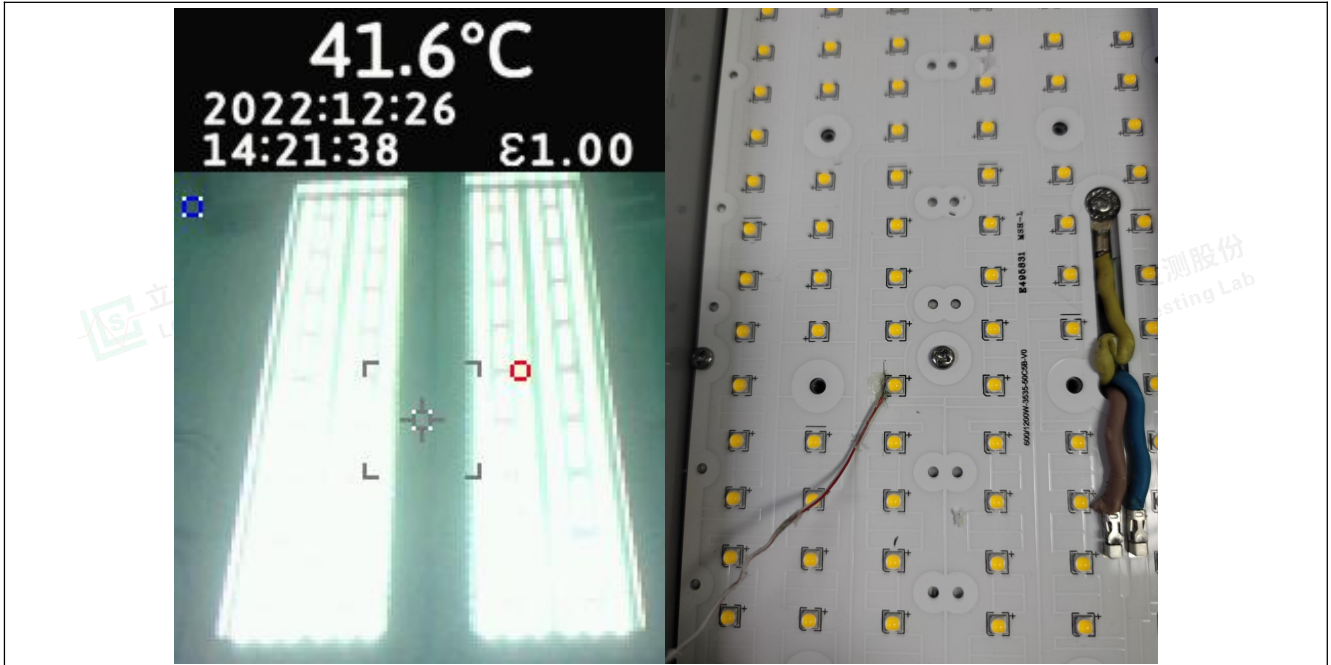


Photo 1

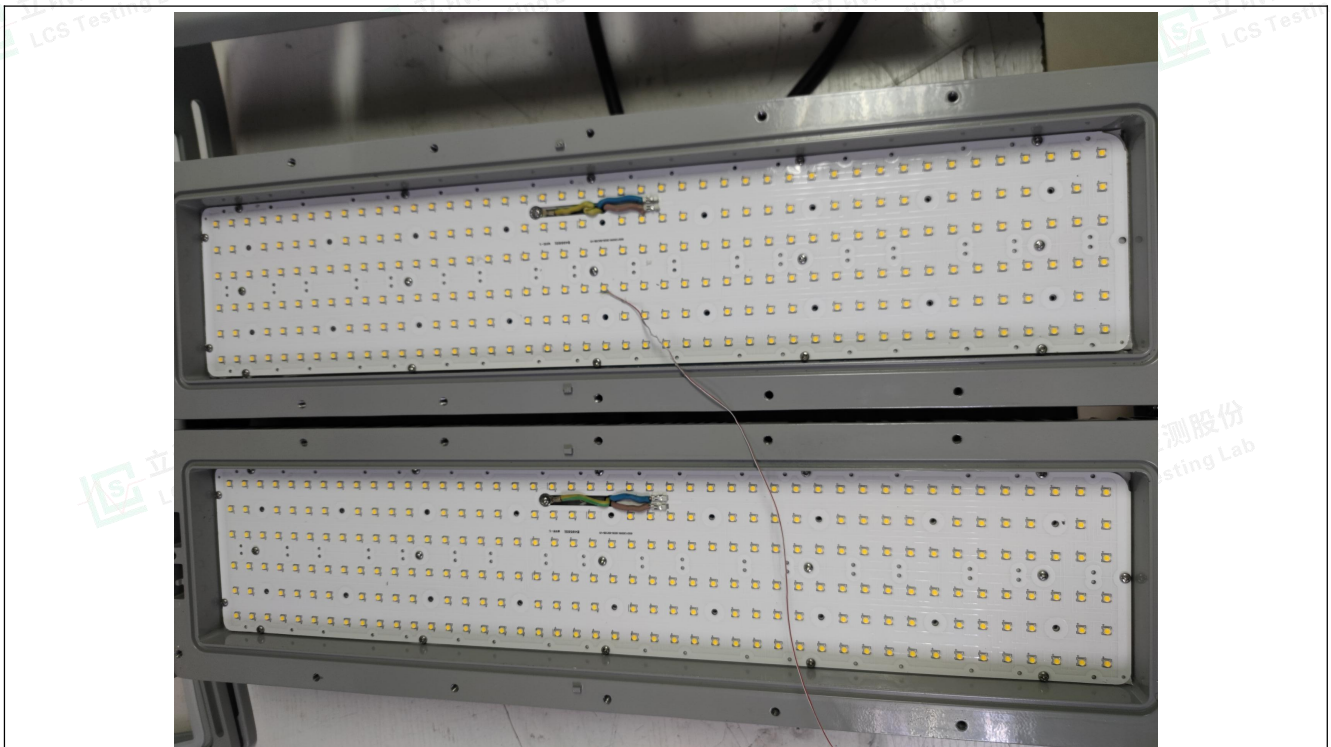


Photo 2





4.2 Thermocouple contact photo (.tc point of LED driver)



Photo 3





4.3 Product Photos



Photo 1

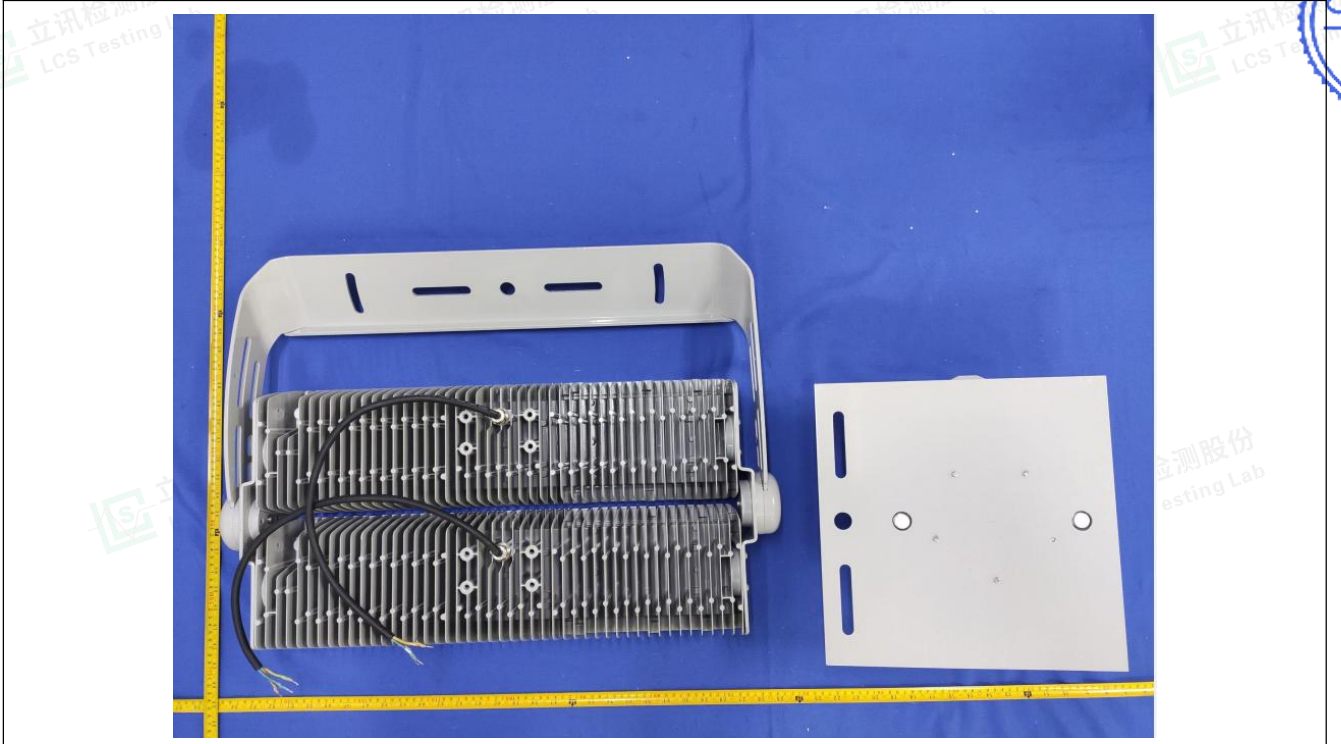


Photo 2





Photo 3 Label of the LED driver

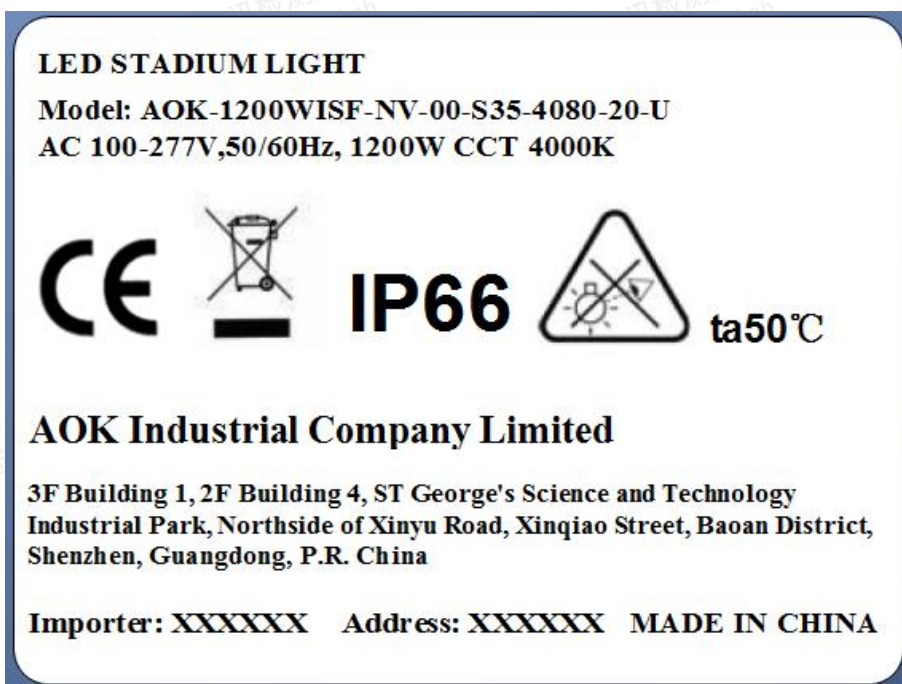


Photo 4 Label of the light

----- End of test report -----

