NVLAP LAB CODE:201045-0

Shenzhen Anbotek Compliance Laboratory Limited

IES LM-79-08 TEST REPORT

For

P.Q.L., Inc.

Report Number:	R011508513L
Product Type:	1x4 Luminaires for Ambient Lighting of Interior Commercial Spaces
Date of Receipt	2015-08-04
Date of Test:	2015-08-04 to 2015-08-19
Date of Report:	2015-08-20
Product Model:	55169 / 5517X
Product Description:	AC100-277V 50/60Hz 35W 3000K/5000K
Product Criteria：	IES LM-79-08: Electrical and Photometric Measurements of Solid-State Lighting Products
Prepared By:	Shenzhen Anbotek Compliance Laboratory Limited 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road,Nanshan District,Shenzhen, Guangdong, China Tel: +86 755 2606 6544 Fax: +86 755 26014772 Web: www.anbotek.com
Tested By:	Rain chen
Reviewed By:	Vic zhou/Energy Lab Manager

Note: This test report is perpared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Anbotek Compliance Laboratory Limited.This report must not be used by the customer to claim product certification, approval, or endorsement By NVLAP,NIST,or any agency of the Federal Government.

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1 – GENERAL

1.1 Product description

General Information

Applicant	P.Q.L., Inc.
Applicant Address	2285 Ward Avenue Simi Valley, CA 93065
Manufacturer	P.Q.L., Inc.
Manufacturer Address	2285 Ward Avenue / Simi Valley, CA 93065
Brand name	Superior Life®
Test Model Number	55169 / 5517X
Burning time before test	0 Hours (For new products)

Rated Values

Rated Inputs	AC100-277V 50/60Hz
Rated Power	35W
Nominal CCT	3000K / 5000K

1.2 Standard of method

- ANSI C78.377-2011:Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits-Related Power Quality Requirements for Lighting Equipment
- CIE Publication No.13.3-1995:Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products

1.3 Test Facility

The test facility used by Shenzhen Anbotek Compliance Laboratory Limited is located at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road,Nanshan District,Shenzhen, Guangdong, China.

2 – Test Equipment List and Details

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Goniophotometeric System	SENSING	GMS-3000	-	-	2015-03-16	2016-03-15
AC Power Source	Ainuo	AN97001W	-	0-300V, 1000VA	2015-03-16	2016-03-15
Digital Power Meter	YOKOGAWA	WT310		0-600V/0-10A/0-100Hz	2015-03-16	2016-03-15
Temperature & Humidity meter	XINIXI	CTH-608	-	0℃~50℃, 10% to 90%RH	2015-03-16	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	220V/500W	S135009	220V/500W	2015-03-16	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	220V/500W	S1350014	220V/500W	2015-03-16	2016-03-15
1.5m Integral Sphere	SENSING	SPR-600M	-	380nm-780nm,0.01lm～6.00×10^5lm	2015-03-16	2016-03-15
Spectrum analyzer	SENSING	SPR-3000	-	380nm-780nm,0.01lm～6.00×10^5lm	2015-03-16	2016-03-15
AC Power Source	ALL POWER	APW-110N	997079	0-300V, 0-1000VA	2015-07-15	2016-07-14
Digital Power Meter	YOKOGAWA	WT210	-	0-600V/0-10A/0-100Hz	2015-03-16	2016-03-15
DC Power Supply	Linkcolor	Linkcolor	-	DC 30V, 5A	2015-03-16	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	110 V / 100 W	S13100190	Refer specification	2015-03-16	2016-03-15
Total Luminous Flux Standard Lamp	SENSING	110 V / 100 W	S1310034	Refer specification	2015-03-16	2016-03-15
Temperature & Humidity meter	XINIXI	CTH-608	-	0℃~50℃, 10% to 90%RH	2015-03-16	2016-03-15

Statement of Traceability:Shenzhen Anbotek Compliance Laboratory Limited attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).

3 - Test Method

3.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25° C ±1° C, the air flow around the sample(s) being tested did not affect the performance.

3.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within±0.2 percent under load.

3.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

3.4 Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards. 4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

3.5 Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The method according to IESNA LM-79-08 following chapter.

4–Test Result

4.1 Photometric test with Integrating Sphere

System 4.1.1 Model: 55169

Electrical data

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.04	60	0.306	35.89	0.976

Photometric data

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
3230.100	7.593	90.00	3049	-0.0019

Chromaticity Coordinate

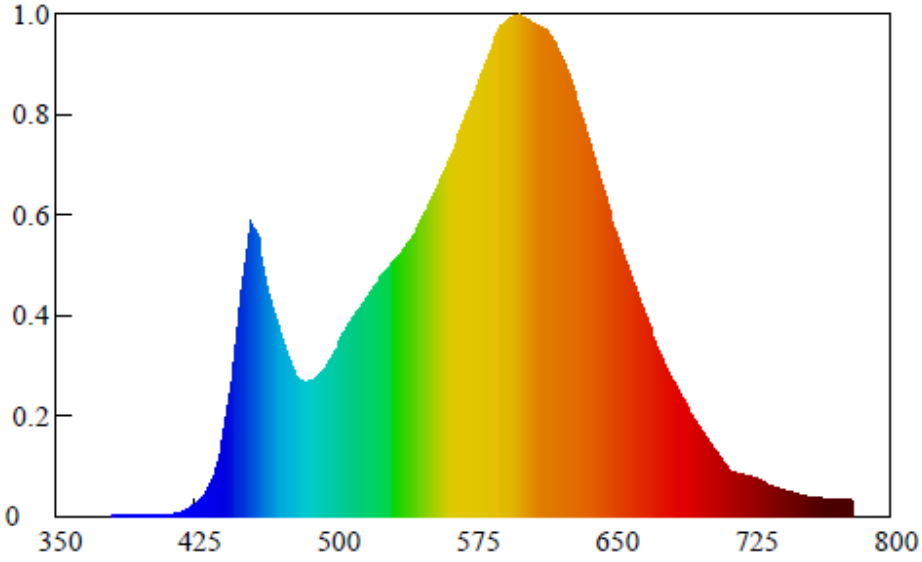
x	y	u	v	u'	v'
0.4308	0.3972	0.2496	0.3451	0.2496	0.5177

Color Rendering Details

Ra
83.1

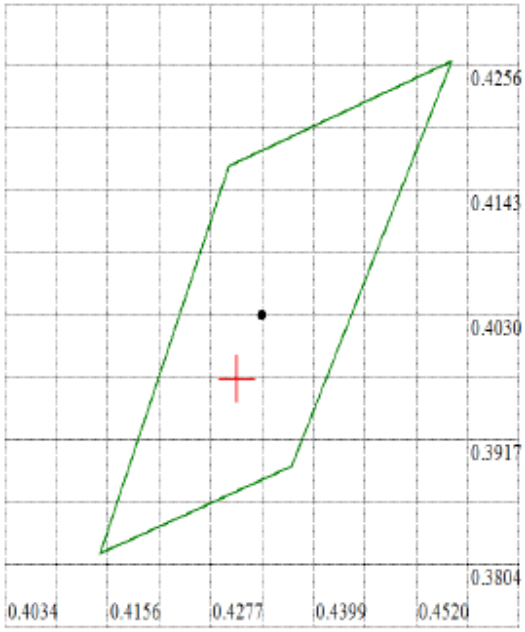
R1	R2	R3	R4	R5
83	94	93	79	83
R6	**R7**	**R8**	**R9**	**R10**
92	81	60	13	86
R11	**R12**	**R13**	**R14**	**R15**
78	73	86	97	76

Spectral Distribution



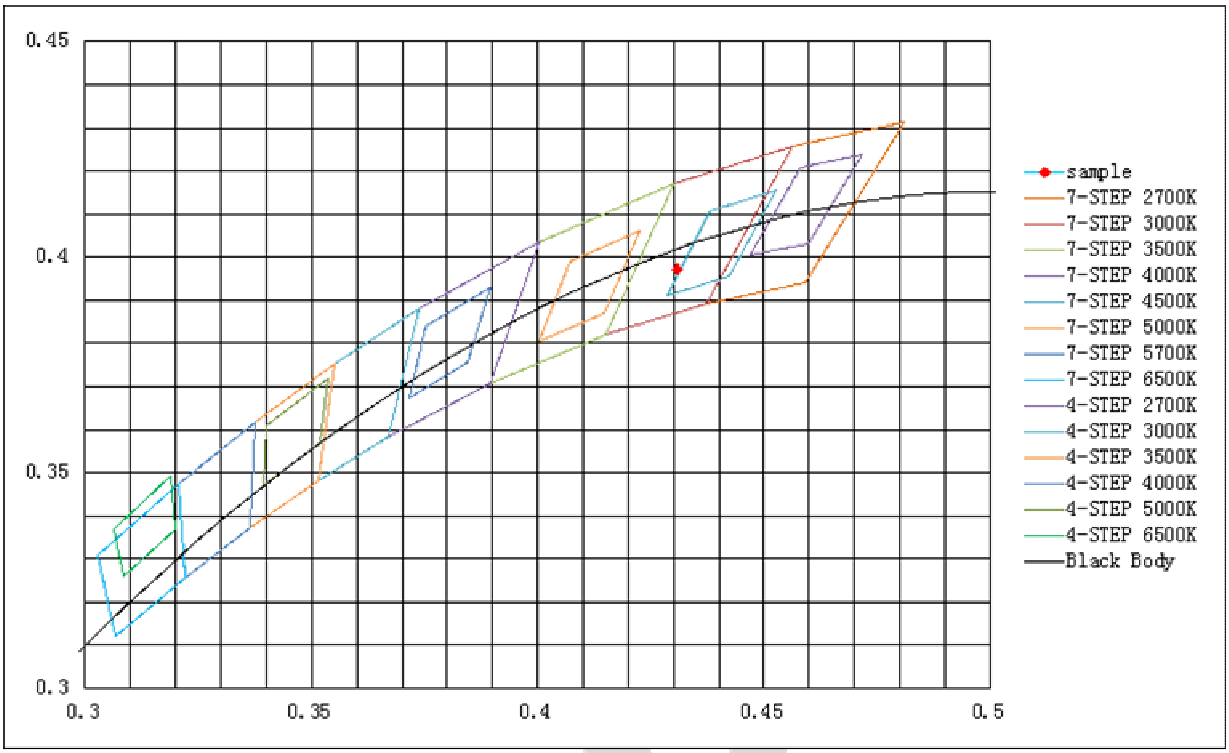
光谱分布 Spectral Distribution

Chromaticity Diagram (CIE 1931)



Nominal CCT:LED 3000K

ANSI Chromaticity Quadrangles Diagram



4.1.2 Model: 5517X

Electrical data

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
119.95	60	0.3072	35.93	0.975

Photometric data

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
3348.803	8.525	93.20	5240	0.00428

Chromaticity Coordinate

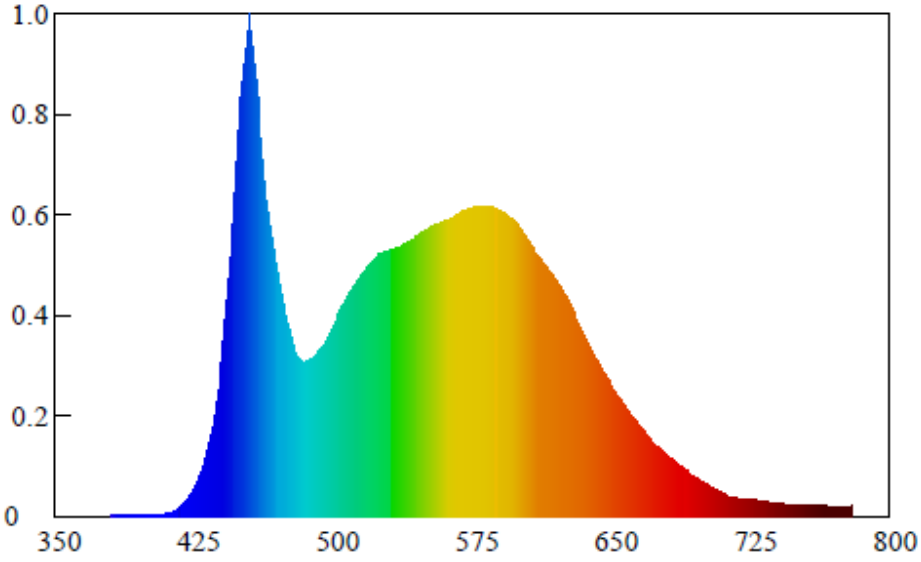
x	y	u	v	u'	v'
0.3392	0.3553	0.206	0.3237	0.206	0.4856

Color Rendering Details

Ra
82.9

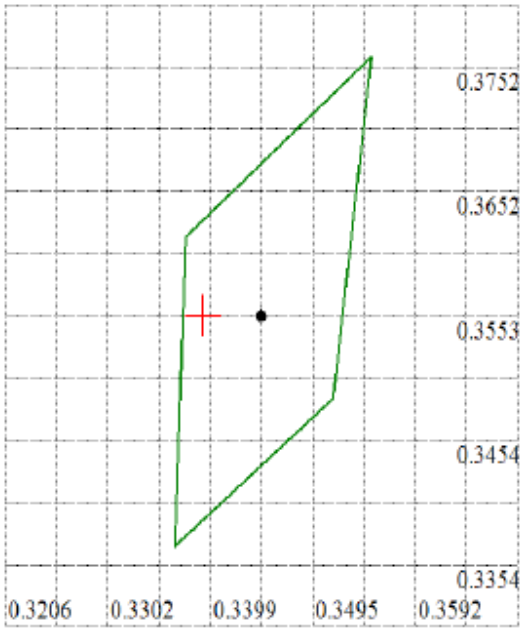
R1	R2	R3	R4	R5
81	91	95	80	81
R6	**R7**	**R8**	**R9**	**R10**
86	86	65	4	77
R11	**R12**	**R13**	**R14**	**R15**
79	60	85	97	75

Spectral Distribution



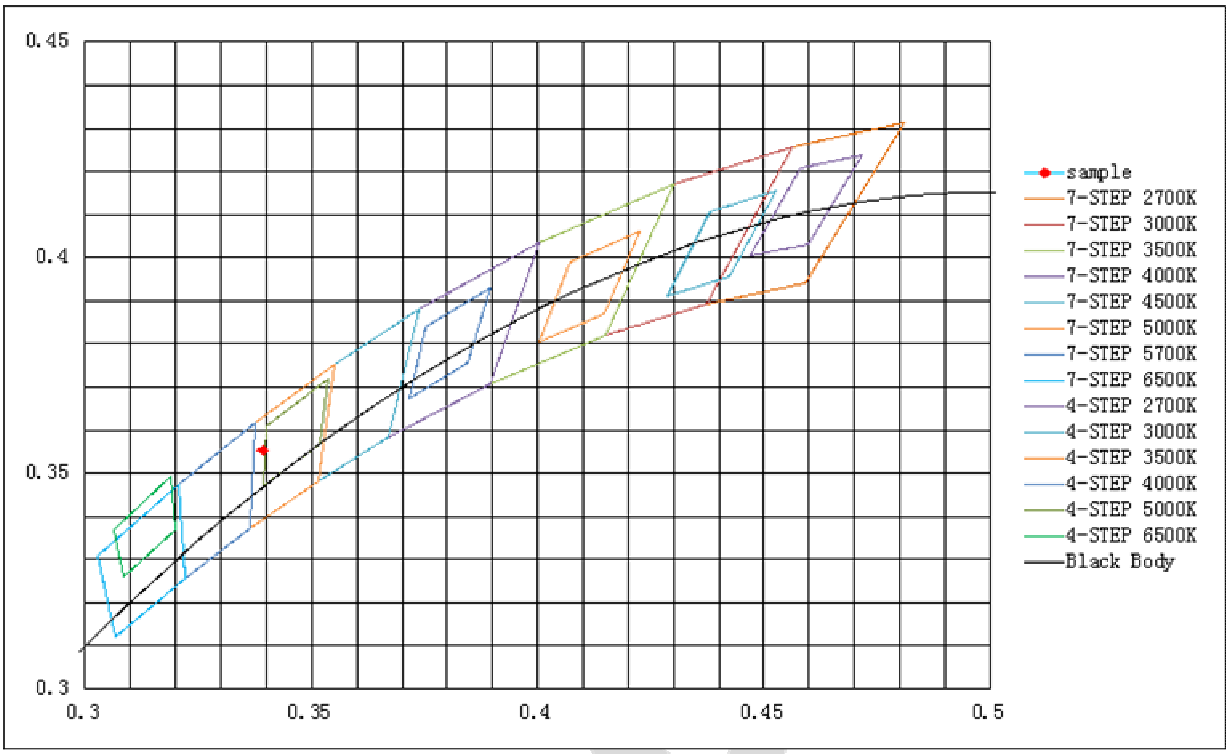
光谱分布 Spectral Distribution

Chromaticity Diagram (CIE 1931)



Nominal CCT:LED_5000K

ANSI Chromaticity Quadrangles Diagram



4.2 Photometric test with Goniophotometer

System 4.2.1 Model: 55169

Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
119.93	60	0.304	35.80	0.983

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	CBCP (cd)	Zonal Lumen Density(0~60°)
3226.25	90.12	1115.486	78.31%

Spacing Criteria 0-180°	Spacing Criteria 90-270°
1.36	1.24

Zonal Lumen Summary

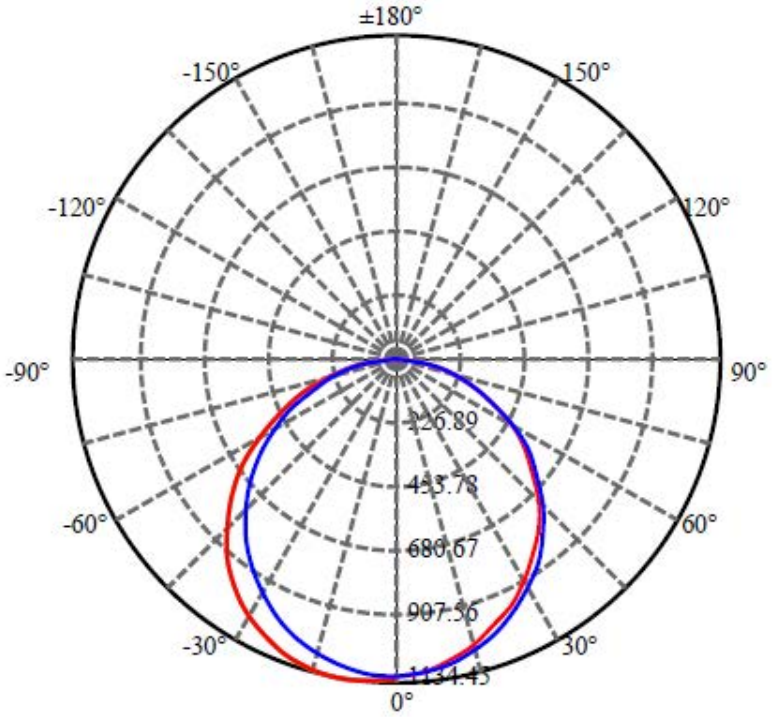
ZONAL LUMEN SUMMARY

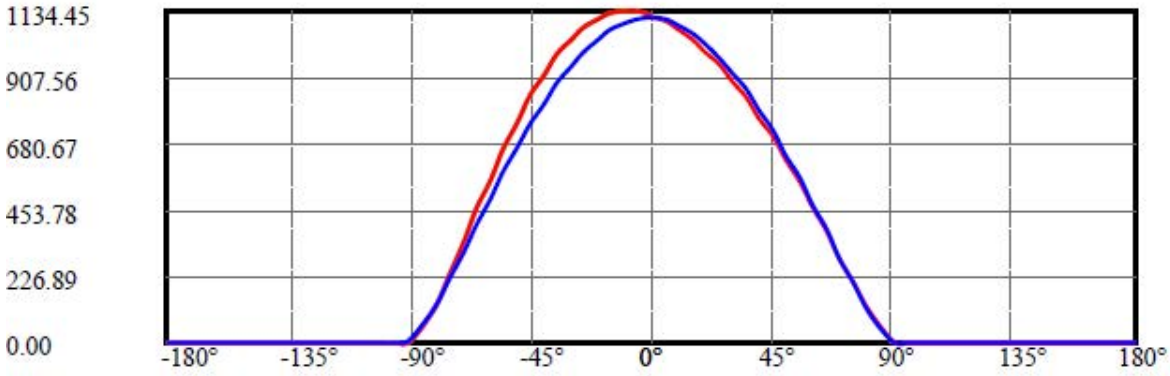
Zone	Lumens	%Fixt
0-30	867.15	26.88%
0-40	1423.47	44.12%
0-60	2526.58	78.31%
0-90	3220.73	99.83%
0-120	3223.03	99.90%
0-180	3226.25	100.00%
60-90	944.60	29.28%
90-120	18.26	0.57%
90-130	19.03	0.59%
90-150	20.47	0.63%
90-180	21.45	0.66%
0-61.24	2581.00	80.00%

ZONAL LUMEN SUMMARY

0-10	105.29
10-20	302.23
20-30	459.63
30-40	556.31
40-50	579.20
50-60	523.91
60-70	398.97
70-80	228.94
80-90	66.24
90-100	1.09
100-110	0.54
110-120	0.66
120-130	0.77
130-140	0.75
140-150	0.70
150-160	0.55
160-170	0.34
170-180	0.08

Light Distribution Curve [Unit: cd]





C180(Max):
C0/C180:
C90/C270:

Field angle(10%Imax):C0/180Left:71.4 Right:90.8
:C90/270Left:81.5 Right:80.7

Beam Angle(50%Imax):C0/180Left:49.6 Right:63.8
:C90/270Left:56.6 Right:55.3

Luminous Intensity (cd) Distribution Data

C/γ(°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
0.0	1115.49	1098.91	1071.92	1038.26	995.04	949.08	895.09	835.46	770.71
22.5	1113.95	1092.42	1064.92	1028.87	986.32	937.46	883.98	822.65	758.58
45.0	1109.51	1091.57	1065.43	1031.09	991.45	941.39	887.91	829.31	760.46
67.5	1105.07	1091.06	1069.87	1037.24	997.77	950.27	895.94	834.95	770.37
90.0	1111.22	1104.04	1086.10	1057.91	1022.54	975.39	921.74	863.82	795.48
112.5	1112.24	1112.07	1101.48	1080.12	1049.03	1007.68	956.60	895.43	829.14
135.0	1112.24	1117.88	1112.92	1097.55	1073.29	1037.07	988.72	930.63	866.04
157.5	1116.34	1125.57	1125.74	1116.51	1096.18	1065.77	1020.66	965.99	899.70
180.0	1120.44	1132.06	1134.45	1127.10	1109.17	1079.10	1036.04	983.93	917.64
202.5	1113.95	1126.25	1128.13	1121.47	1103.53	1073.97	1032.97	977.61	915.08
225.0	1109.51	1118.73	1118.05	1107.12	1084.56	1052.44	1007.00	952.84	887.74
247.5	1105.07	1108.65	1101.14	1085.25	1056.20	1019.13	973.85	914.22	849.30
270.0	1111.22	1107.63	1093.79	1071.58	1038.26	994.87	945.66	887.74	819.06
292.5	1112.24	1102.84	1084.05	1054.66	1017.93	973.17	919.01	861.09	795.14
315.0	1112.24	1096.69	1072.09	1040.65	1001.87	952.67	901.07	842.47	774.64
337.5	1116.34	1096.18	1069.70	1036.72	993.67	946.51	894.41	832.22	769.68
360.0	1115.49	1098.91	1071.92	1038.26	995.04	949.08	895.09	835.46	770.71

C/γ(°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
0.0	702.37	625.49	547.92	466.77	377.92	289.42	205.53	123.35	57.41
22.5	690.41	617.63	535.28	454.46	367.84	283.44	200.24	121.48	52.11
45.0	691.09	617.97	537.33	453.27	366.48	282.42	199.38	117.72	52.11
67.5	701.34	622.75	543.31	460.61	372.97	284.30	198.02	120.28	52.79
90.0	723.73	641.55	560.22	473.77	385.61	291.13	204.34	121.48	50.91
112.5	750.55	671.10	586.02	493.93	401.33	301.72	209.63	125.06	52.28
135.0	792.41	704.76	616.09	521.61	420.12	317.10	217.15	128.65	52.45
157.5	824.53	735.34	643.08	545.01	443.19	331.96	230.14	132.92	53.13
180.0	842.64	752.09	659.83	559.37	454.63	343.92	232.53	136.00	54.50
202.5	841.10	753.28	662.22	563.47	453.78	348.54	241.41	139.24	55.53
225.0	812.91	729.19	637.79	539.72	441.14	333.33	234.07	142.32	58.60
247.5	775.83	695.36	608.57	515.80	419.27	324.62	224.67	137.71	62.36
270.0	748.84	669.57	584.48	495.47	403.72	310.44	221.08	133.09	61.16
292.5	723.04	645.30	566.54	477.02	390.39	297.79	212.54	133.26	59.29
315.0	706.98	630.27	550.31	468.30	379.46	294.55	210.83	127.97	58.43
337.5	699.64	626.00	547.07	460.79	377.07	291.81	203.48	126.60	60.14
360.0	702.37	625.49	547.92	466.77	377.92	289.42	205.53	123.35	57.41

C/γ(°)	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0
0.0	1.54	0.34	0.34	0.34	0.51	0.68	0.68	0.85	1.03
22.5	2.56	0.51	0.51	0.51	0.68	0.68	0.85	0.85	1.03
45.0	2.56	0.68	0.51	0.68	0.51	0.68	0.85	1.03	1.03
67.5	2.90	0.68	0.68	0.68	0.68	0.68	0.85	1.03	1.03
90.0	2.22	0.68	0.68	0.68	0.68	0.68	0.85	1.03	1.03
112.5	0.85	0.68	0.68	0.68	0.68	0.85	0.85	0.85	0.85
135.0	0.68	0.68	0.34	0.51	0.51	0.68	0.68	0.85	0.85
157.5	0.51	0.68	0.51	0.51	0.51	0.68	0.85	0.85	1.03
180.0	0.68	0.68	0.34	0.51	0.51	0.68	0.85	0.85	0.85
202.5	0.85	0.34	0.34	0.51	0.51	0.51	0.85	0.68	0.85
225.0	3.25	0.51	0.34	0.34	0.51	0.51	0.68	0.85	0.85
247.5	3.59	0.34	0.34	0.51	0.68	0.68	0.85	0.85	0.85
270.0	5.13	0.34	0.34	0.34	0.68	0.51	0.68	0.85	1.03
292.5	4.95	0.51	0.51	0.51	0.51	0.68	0.68	0.68	0.85
315.0	4.78	0.34	0.34	0.34	0.51	0.68	0.68	0.85	0.85
337.5	2.73	0.34	0.34	0.51	0.68	0.51	0.68	0.85	0.85
360.0	1.54	0.34	0.34	0.34	0.51	0.68	0.68	0.85	1.03

C/γ(°)	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0
0.0	1.03	1.03	1.03	1.03	1.03	1.03	1.20	1.20	1.20
22.5	1.03	1.20	1.37	1.37	1.20	1.20	1.37	1.20	1.03
45.0	1.03	1.20	1.20	1.20	1.37	1.20	1.20	1.20	1.03
67.5	1.03	1.20	1.20	1.37	1.20	1.37	1.37	1.37	1.37
90.0	1.03	1.20	1.20	1.37	1.20	1.20	1.20	1.20	1.37
112.5	1.03	1.03	1.37	1.37	1.37	1.37	1.20	1.20	1.20
135.0	1.03	1.03	1.20	1.20	1.37	1.37	1.37	1.20	1.20
157.5	1.03	1.03	1.03	1.03	1.20	1.20	1.20	1.20	1.20
180.0	0.85	0.85	1.03	1.20	1.03	1.20	1.20	1.03	1.03
202.5	0.85	0.85	1.03	1.03	1.03	1.03	1.03	1.20	1.20
225.0	0.85	1.03	1.03	1.20	1.03	1.20	1.20	1.20	1.20
247.5	0.85	0.85	1.03	1.03	1.20	1.20	1.20	1.20	1.20
270.0	0.85	1.03	1.20	1.03	1.20	1.37	1.20	1.20	1.20
292.5	0.85	1.03	1.03	1.03	1.37	1.20	1.20	1.20	1.20
315.0	1.03	1.03	1.20	1.03	1.20	1.20	1.03	1.20	1.20
337.5	0.85	0.85	1.03	1.03	1.20	1.03	1.20	1.03	1.20
360.0	1.03	1.03	1.03	1.03	1.03	1.03	1.20	1.20	1.20

C/γ(°)	180.0
0.0	1.20
22.5	1.20
45.0	1.37
67.5	1.20
90.0	1.37
112.5	1.37
135.0	1.20
157.5	1.20
180.0	1.20
202.5	1.20
225.0	1.37
247.5	1.20
270.0	1.37
292.5	1.37
315.0	1.20
337.5	1.20
360.0	1.20

5-Additional Test

55169

Test item	Test Voltage (V)	Frequency(Hz)	Test Result
Power Factor	277	60	0.943
Total harmonic Distortion	277	60	17.38%
Off State Power (W)	120	60	0

5517X

Test item	Test Voltage (V)	Frequency(Hz)	Test Result
Power Factor	277	60	0.957
Total harmonic Distortion	277	60	17.12%
Off State Power (W)	120	60	0

The test data was only good for the test sample. It may have deviation for other test sample.

Attachment A – Product PHOTO

FRONT PHOTO

REVERSE PHOTO

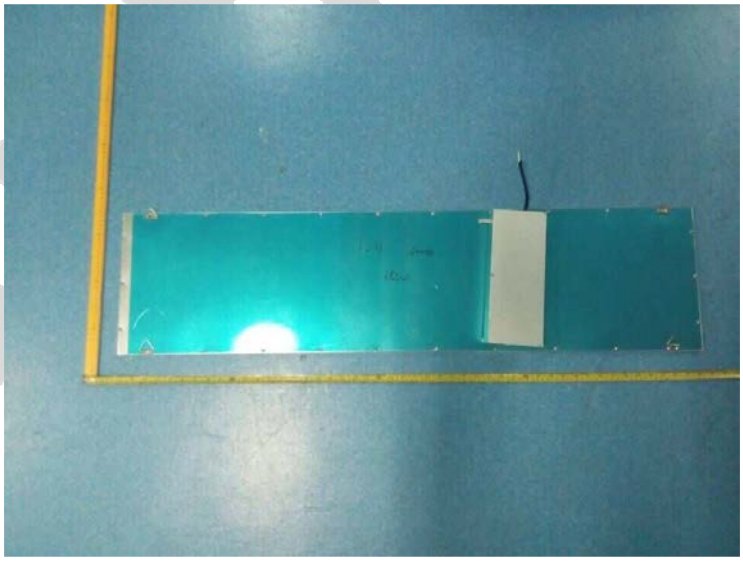


PHOTO 1 3000K

FRONT PHOTO

REVERSE PHOTO

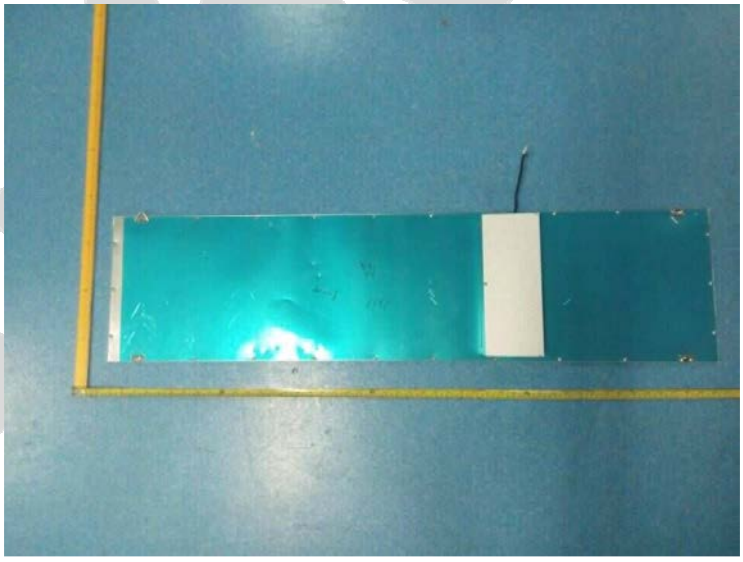


PHOTO 2 5000K

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