



UL-CCIC Company Limited  
No.2 Chengwan Road,  
Suzhou Industrial Park  
Suzhou 215122, China  
86-512-68086400



## Photometric Test Report

### Relevant Standards

- IES LM-79-2008
- ANSI C82.77-2002
- UL1598-2008/ UL1993-2012

### Prepared For

**P.Q.L., Inc.**

2285 Ward Avenue  
Simi Valley, CA 93065

### Catalog Number

55172

### Project Number

4787477968

### Report Number

4787477968\_15R01

### Test Date

6/7/2016-6/17/2016

### Issue Date

7/4/2016

Prepared By

Jonathan Xu

Approved By

Duff Yang

The results contained in this report pertain only to the tested sample.

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## 1.0 Test Summary

DLC Technical Requirements v4.0

<i>Integrated Retrofit Kits for 2x4 Luminaires</i>				
Requirement Category	Test Method	Requirements	Test value	Results (Fail/Pass)
Minimum Light Output (lm)	IES LM-79-2008	3000lm	4978.69	Pass
Minimum Lamp Output (lm)	IES LM-79-2008	N/A	N/A	N/A
Spacing Criteria (0-180°)	IES LM-79-2008	1.0-2.0	1.22	N/A
Spacing Criteria (90-270°)	IES LM-79-2008	1.0-2.0	1.3	N/A
Zonal Lumen Requirement (0°-60°)	IES LM-79-2008	75%	75.10%	Pass
Zonal Lumen Requirement 2	IES LM-79-2008	N/A	N/A	N/A
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	121.25lm/W	121.65	Pass
Minimum Lamp Efficacy (lm/ft)	IES LM-79-2008	N/A	N/A	N/A
Allowable CCTs* (K)	IES LM-79-2008	≤5000	3367	Pass
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥80	82.42	Pass
L70 Lumen maintenance (hours)	IES LM-80-2015 IES TM-21-2011	≥50000	≥50000	Pass
L90 Lumen maintenance (hours)	IES LM-80-2015 IES TM-21-2011	N/A	N/A	N/A
Power Factor	ANSI C82.77-2002	≥0.9	0.95	Pass
Total Harmonic Distortion (A%)	ANSI C82.77-2002	≤20%	4.50%	Pass
In-Situ Temperature Measurement Test for LED (°C)	UL1598-2008/ UL1993-2012	≤105	37.7	Pass
In-Situ Temperature Measurement Test for Driver (°C)	UL1598-2008/ UL1993-2012	N/A	N/A	N/A
Minimum Luminaire Warranty (years)	N/A	5	5	Pass

\*Defined by ANSI C78.377-2011‡

‡ANSI C78.377-2015 also referred to for Duv and (x,y) chromaticity coordinates tolerances for indoor categories.



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### 3.0 Test List

Test Item	Test	Test Date	Model Number	Tests Conducted By
1	Integrating Sphere Test for the Lower CCT	6/7/2016	3500K	Gavin Yang
2	Integrating Sphere Test for the Higher CCT	6/8/2016	5000K	Gavin Yang
3	Goniophotometer Test	6/15/2016	3500K	Gavin Yang
4	THD and PF Test	6/7/2016	3500K	Gavin Yang
5	In-Situ Temperature Measurement Test	6/17/2016	3500K	Gavin Yang

#### Remark (if any)

1. UL test equipment information is recorded on Meter Use in UL's Laboratory Project Management (LPM) database.
2. This report replace 4787477968\_15 (original report number), the report 4787477968\_15 is terminated.



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#### 4.0 Production Description

**Luminaire Description:** Integrated Retrofit Kits for 2x4 Luminaires

**Model Number:** 55172

**Rated Voltage:** 120~277V

**Frequency:** 50/60 Hz

**LED Packagr:** 5630

**Family Model and Variation:** 55166

**Housing Model Number:** Lithonia 2GT8 2 32 A12 MVOL GEB10IS

**Photos of Luminaire Characteristics**





## 5.0 LM-79 Measurement and Test Results

### 5.1 Integrating Sphere Test for the lower CCT

Model No.	55172	Sample ID.	336504-7
Opreate time (Min.)	90	Stabilization time (Min.)	45

#### Test Method

1. The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 32 A12 MVOL GEB10IS.  
 2. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° C.  
 3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

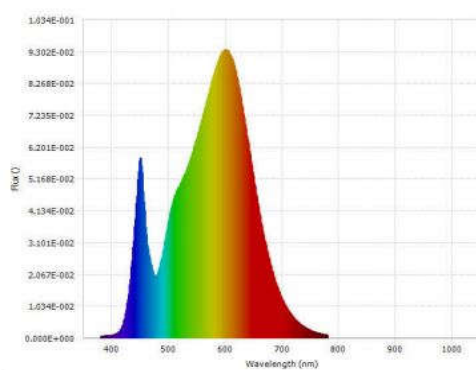
#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency(Hz)	Current (A)	Power (W)	Power Factor	Orientation
25	120.03	60	0.34161	40.928	1.00	horizontal

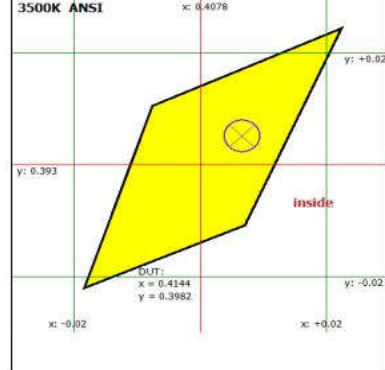
#### Test Results

CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)
3367	82.42	0.0013	4978.69	121.65

Spectral Flux Graph



Chromaticity Diagram



Spectral Result

Luminous Flux $\Phi(v)$	4978.69 (lm)	Chrom x	0.4144
Chrom y	0.3982	Chrom u	0.2385
Chrom v	0.3438	Duv	0.0013
Chrom u'	0.2385	Chrom v'	0.5157
CCT	3367.0 (K)	Luminous Efficacy $\eta$	121.65 (lm/W)
Ra	82.42	R1	80.1
R2	89.2	R3	96.6
R4	81.3	R5	80.6
R6	86.4	R7	84.5
R8	60.7	R9	4.9
R10	75.5	R11	80.4
R12	70.7	R13	82.0
R14	98.3	R15	72.9
Rf	83	Rg	96



## 5.0 LM-79 Measurement and Test Results

### 5.2 Integrating Sphere Test for the higher CCT

Model No.	55166	Sample ID.	336504-9
Operate time (Min.)	90	Stabilization time (Min.)	45

#### Test Method

- The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 32 A12 MVOL GEB10IS.
- Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° C.
- The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

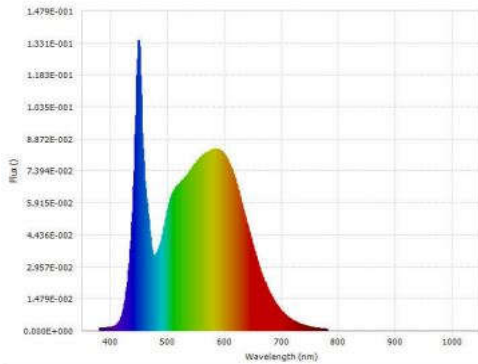
#### Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency(Hz)	Current (A)	Power (W)	Power Factor	Orientation
25	120.04	60	0.34121	40.882	1.00	horizontal

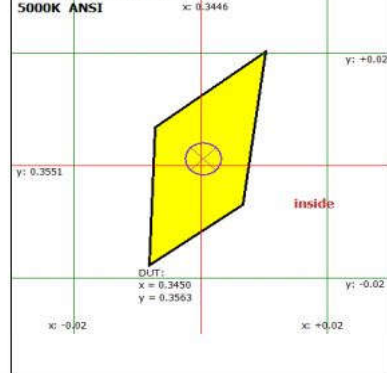
#### Test Results

CCT (K)	CRI (Ra)	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)
5017	83.4	0.0024	5345.13	130.75

Spectral Flux Graph



Chromaticity Diagram



Spectral Result

Luminous Flux $\Phi(v)$	5345.13 (lm)	Chrom x	0.3450
Chrom y	0.3563	Chrom u	0.2095
Chrom v	0.3246	Duv	0.0024
Chrom u'	0.2095	Chrom v'	0.4869
CCT	5017.0 (K)	Luminous Efficacy $\eta$	130.75 (lm/W)
Ra	83.4	R1	81.4
R2	88.1	R3	93.2
R4	83.8	R5	82.9
R6	84.1	R7	86.5
R8	67.0	R9	6.7
R10	72.4	R11	83.8
R12	68.1	R13	83.0
R14	96.5	R15	75.7
Rf	83	Rg	96



## 5.0 LM-79 Measurement and Test Results

### 5.3 Goniophotometer Test

<b>Model No.</b>	55172	<b>Sample ID.</b>	336504-7
<b>Operate time (Min.)</b>	90	<b>Stabilization time (Min.)</b>	45

#### Test Method

1. The sample was tested according to the IES LM-79-2008 in fixture Lithonia 2GT8 2 32 A12 MVOL GEB10IS.
2. Photometric parameters were measured using a type C goniophotometer and software.
3. The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
4. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 22.5° horizontal intervals.

#### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency	Current (A)	Power (W)	Power Factor	Orientation
25	120.06	60	0.34023	40.788	0.998	horizontal

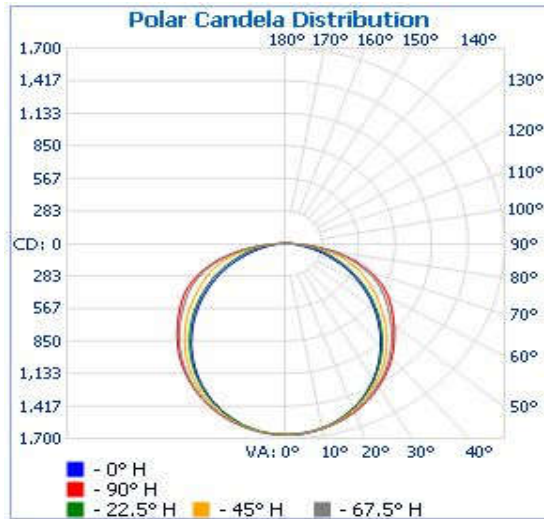
#### Test Result

Flux (lm)	Zonal Lumen Requirement (0°-60°)	Field Angle (10%)		Beam Angle (50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
5007.1	75.1%	169.1	158.1	127.7	105.3	122.76
SC	SC					
0~180°	90°~270°					
1.22	1.3					

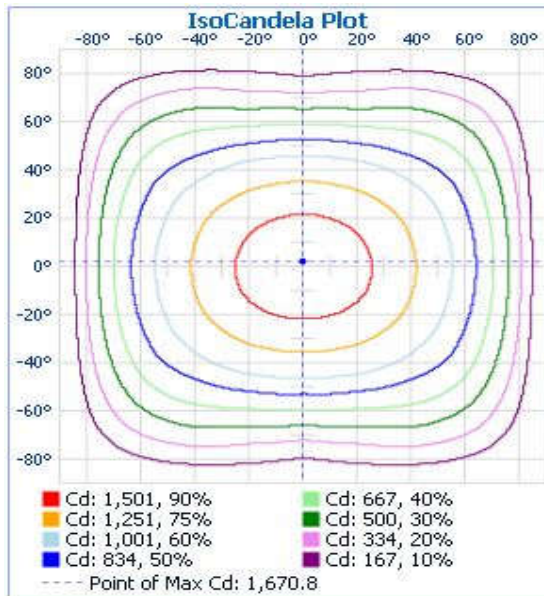


## 5.2 Goniophotometer Test (Cont'd)

### Light Distribution Curve



### IsoCandela Plot







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## 5.2 Goniophotometer Test (Cont'd)

### Zonal Lumen Summary

#### Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	1,288.8	25.7%
0-40	2,109.2	42.1%
0-60	3,758.4	75.1%
60-90	1,227.1	24.5%
70-100	573.7	11.5%
90-120	10.6	0.2%
0-90	4,985.5	99.6%
90-180	21.1	0.4%
0-180	5,006.6	100%

### Lumens Per Zone

#### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	39.7	0.8%	90-95	2.3	0%
5-10	117.8	2.4%	95-100	1.8	0%
10-15	191.6	3.8%	100-105	1.6	0%
15-20	258.7	5.2%	105-110	1.6	0%
20-25	316.8	6.3%	110-115	1.6	0%
25-30	364.1	7.3%	115-120	1.6	0%
30-35	399.1	8.0%	120-125	1.5	0%
35-40	421.3	8.4%	125-130	1.5	0%
40-45	429.7	8.6%	130-135	1.3	0%
45-50	425.4	8.5%	135-140	1.2	0%
50-55	409.6	8.2%	140-145	1.1	0%
55-60	384.5	7.7%	145-150	1.0	0%
60-65	351.0	7.0%	150-155	0.8	0%
65-70	306.5	6.1%	155-160	0.7	0%
70-75	250.2	5.0%	160-165	0.6	0%
75-80	184.8	3.7%	165-170	0.5	0%
80-85	107.7	2.2%	170-175	0.3	0%
85-90	26.9	0.5%	175-180	0.1	0%





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## 6.0 THD and PF Test

<b>Model No.</b>	55172	<b>Sample ID.</b>	336504-7
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### Test Method

1. The samples were tested according to the ANSI C82.77-2002 in fixture Lithonia 2GT8 2 32 A12 MVOL GEB10IS.
2. The ambient temperature condition was maintained at 25° C ± 1° C. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

### Test Results

Temperature (°C)	Voltage (Vac)	Frequency	Current (A)	Power (W)	Power Factor	Current THD
25	277.08	60	0.15054	39.804	0.95	4.50%



## 7.0 In-Situ Temperature Measurement Test

<b>Model No.</b>	55172	<b>Sample ID.</b>	336504-7
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### Test Method

1. In-Situ Temperature Measurement Test is conducted according to the UL1598-2008, Section 14 or UL1993-2012, Section 8.5 in fixture Lithonia 2GT8 2 32 A12 MVOL GEB10IS.

2. The testing was conducted in a room with ambient temperature of 25°C ± 5°C. The apparatus construction followed those described in UL1598-2008 for normal temperature testing. Thermocouples were placed on the LED package in the locations indicated by LM-80 report. The temperature was recorded after the lamp was operated by 3.5 hours in stability or by 7.5 hours.

### In-Situ Temperature Measurement Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency	Current (A)	Power (W)	Power Factor	Orientation
24.5	120.03	60	0.34161	40.928	1.00	horizontal

### Test Results(LED)

Thermocouple Location	Manufacturer Declared Current (mA)	Temperature for Lighting source (°C)		LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp. (°C)
		Test result column 1	Test result (Correct to 25 °C)			
TMP of LEDs	106.25	37.2	37.7	5630	150	85
Ambient temperature	N/A	24.5	25.0			

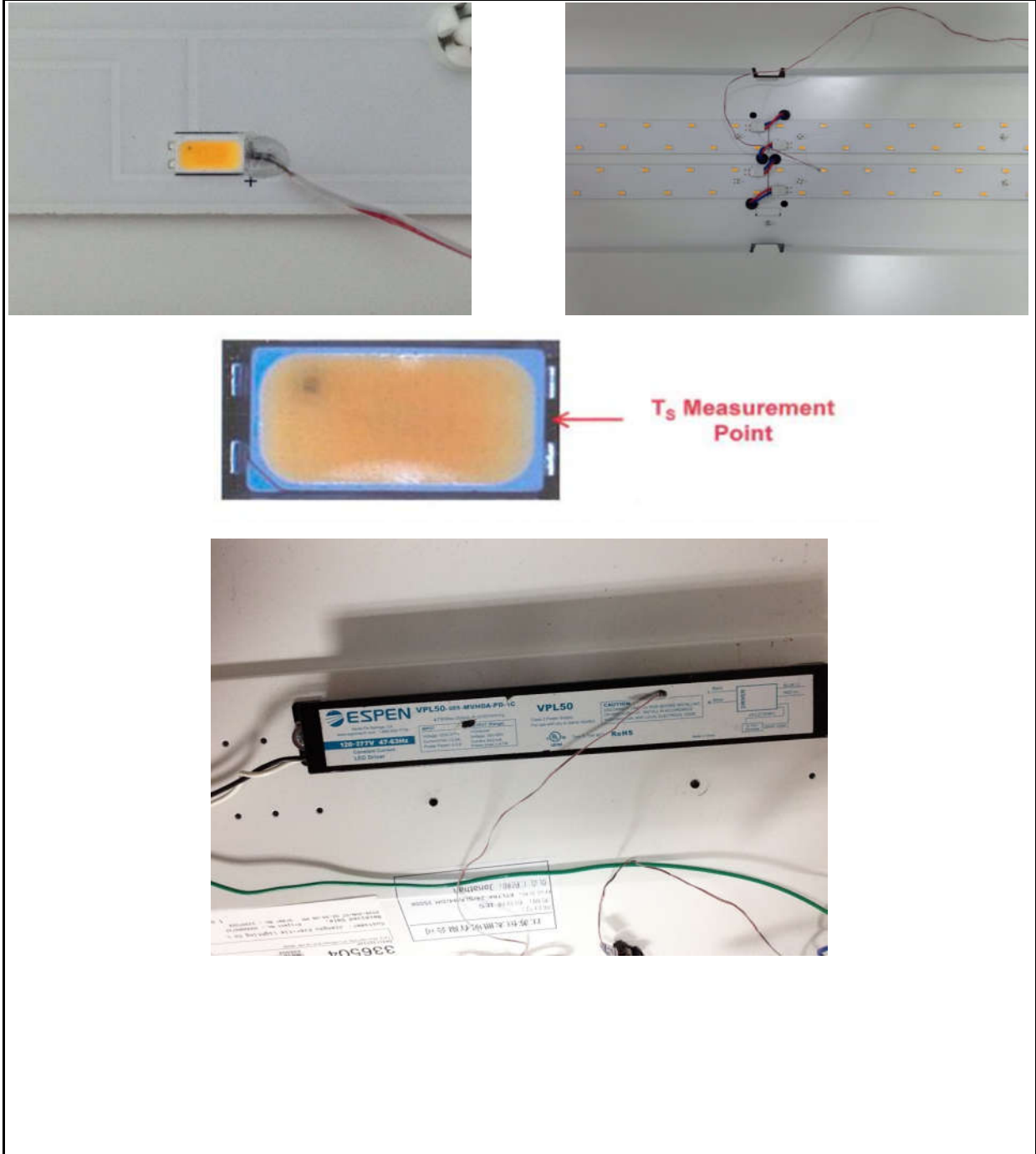
### Test Results(Driver)

Thermocouple Location	Temperature for Driver (°C)		Driver Model Number	Driver Limit Temp. (°C)
	Test result column 1	Test result (Correct to 25 °C)		
TMP of Driver	35.8	36.3	VPL50-085-MVHDA-PD-1C	85
Ambient temperature	24.5	25.0		



## 7.0 In-Situ Temperature Measurement Test (Cont'd)

Test Photos for T<sub>c</sub> Point of LED Packages





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