



## Photometric Test Report

### Relevant Standards

UL1598-2008

ANSI C82.77-10-2014

IES LM-79-2008

### Prepared For

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

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### Test Laboratory:

UL Verification Services (Guangzhou) Co., Ltd.

### Test Laboratory Address:

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### Catalog Number

84534

### Project Number

4789163216

### Report Number

4789163216\_4

### Test Date

2019-09-02~2019-09-30

### Issue Date

2019-10-11

### Revision Date

N/A

### Prepared By

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### Approved By

Susie Shao

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

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## Test Summary

### DLC Technical Requirements v4.4- issued 2018-10-18

Requirement Category	Test Method	Requirements	Tolerance	Test Result
Minimum Light Output (lm)-Luminaires	IES LM-79-2008	≥1000	-10%	3819.6
Zonal Lumen Requirement 1(0°-90°)	IES LM-79-2008	≥85%	-3%	100.00%
Minimum Luminaire Efficacy (lm/W)-Luminaires	IES LM-79-2008	≥110	-3%	131.21
L70 Lumen maintenance (Hours)	N/A	≥50000	N/A	≥50000
L90 Lumen maintenance (Hours)	N/A	≥36000	N/A	≥36000
Power Factor	ANSI C82.77-10-2014	≥0.9	-0.03	0.9429
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	9.90%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	67.8
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	63.5
Minimum Luminaire Warranty (Years)	N/A	≥5	N/A	≥5



## Test List

Sample Received Date: 2019-08-30

Test Item	Test Date	Model Number	Tests Conducted By
Goniophotometer Test	2019-09-02	84534	Howie Wang
THD and PF Test	2019-09-02	84534	Howie Wang
In-Situ Temperature Measurement Test	2019-09-30	84534	Howie Wang

### Remark (if any)

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.
2. The accuracy method decision rule is applied when the compliance or verdict is made to the results of this report.



## Product Description

**Lamp/Luminaire Description:** Architectural Flood and Spot Luminaires

**Model Number:** 84534

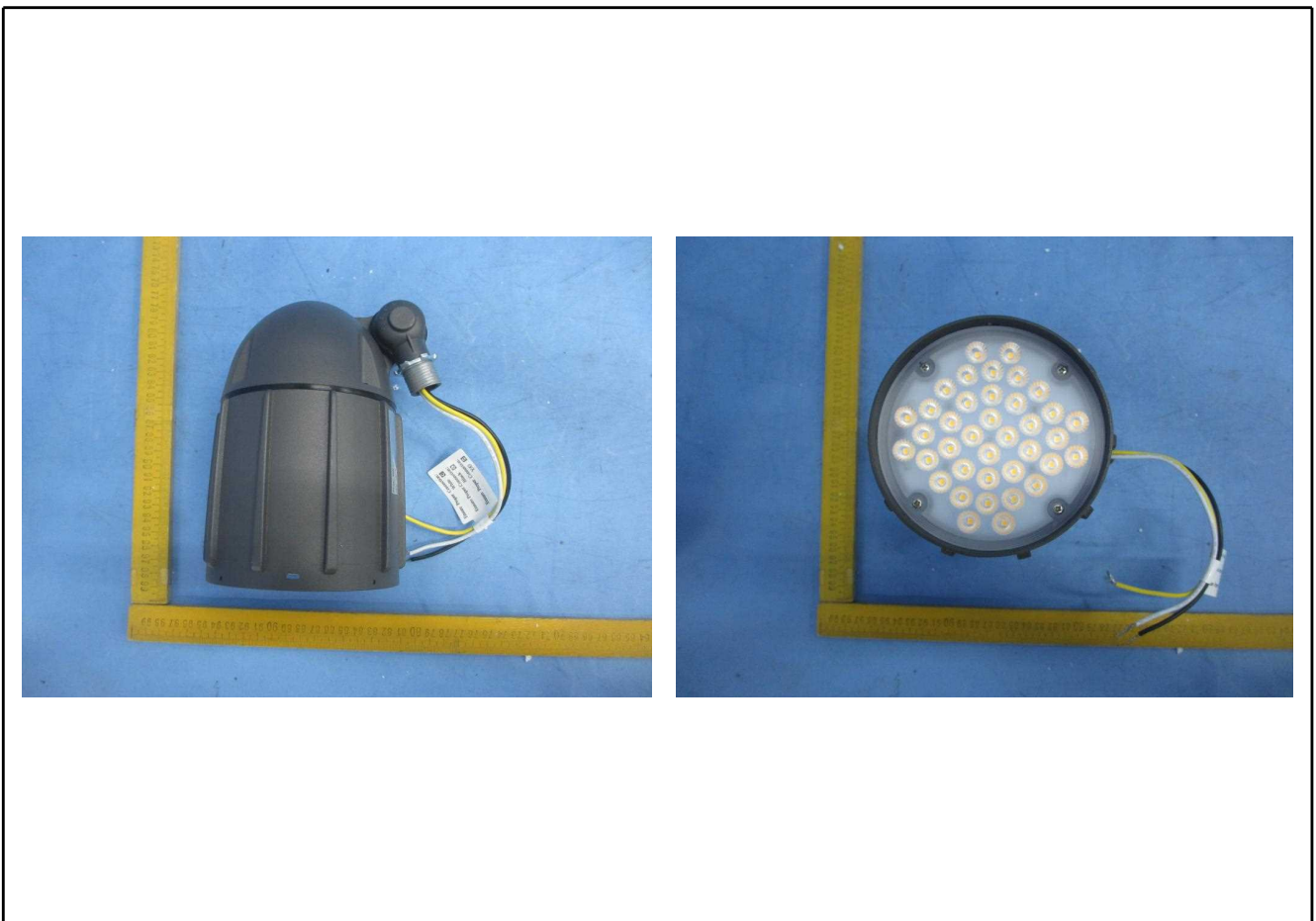
**Electrical Parameter:** 100-277 Vac, 50/60 Hz, 30 W

**Optical Parameter:** 3000K

**LED Package:** SAW7C22B-NZ

**Family Model and Variation:** CCTs, can be 3000K, 4000K or 5000K; Finish color, can be Bronze, White or Black; Distribution, can be Narrow, Medium or Wide; Photocontrol, can be Photocontrol or No photocontrol.

## Photos of Products Characteristics





## Goniophotometer Test

<b>Model No.</b>	84534	<b>Sample ID.</b>	2524248
<b>Operate time (Min.)</b>	80	<b>Stabilization time (Min.)</b>	70

### Test Method

- 1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
- 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.The reference standard lamp is rated current 3.812A, 3.843A, 3.837A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
- 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 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.

### Goniophotometer Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
26.0	120.01	60	0.2487	29.11	0.9754	5.22%	Horizontal

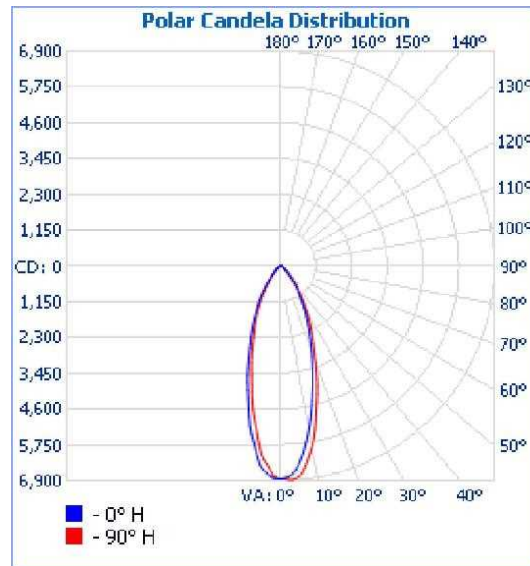
### Test Results

Luminous Flux (lm)	Zonal Lumen Requirement 1	Zonal Lumen Requirement 2	Beam Angle (50%)		Luminous Efficacy (lm/W)	Spacing Criteria (0-180°)	Spacing Criteria (90°-270°)
	0°-90°	N/A	Horizontal Spread	Vertical Spread			
3819.6	100.00%	N/A	35.5	35.6	131.21	N/A	N/A

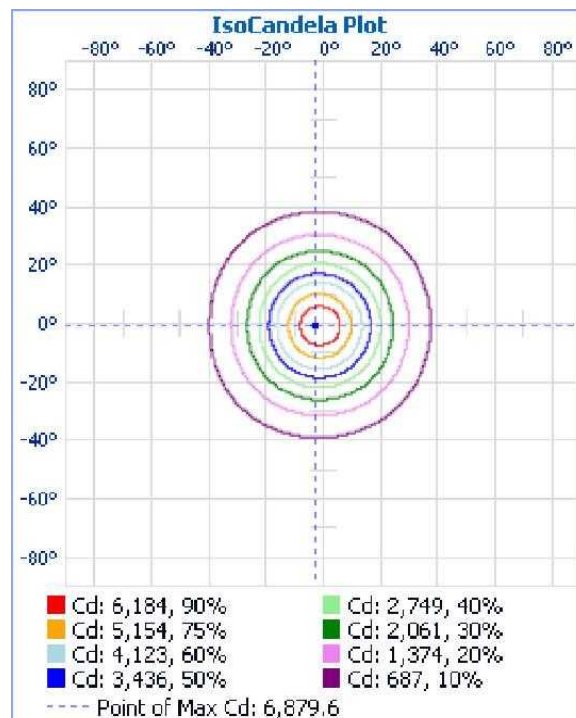


## Goniophotometer Test (Cont'd)

### Polar Candela Distribution



### IsoCandela Plot





**Goniophotometer Test (Cont'd)**  
Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2693.6	70.50%
0-40	3307.3	86.60%
0-60	3720.6	97.40%
60-90	99.0	2.60%
70-100	31.1	0.80%
90-120	0.0	0.00%
0-90	3819.6	100.00%
90-180	0.0	0.00%
0-180	3819.6	100.00%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-5	159.4	4.20%	90-95	0.0	0.00%
5-10	423.0	11.10%	95-100	0.0	0.00%
10-15	556.4	14.60%	100-105	0.0	0.00%
15-20	574.9	15.10%	105-110	0.0	0.00%
20-25	527.5	13.80%	110-115	0.0	0.00%
25-30	452.5	11.80%	115-120	0.0	0.00%
30-35	357.6	9.40%	120-125	0.0	0.00%
35-40	256.2	6.70%	125-130	0.0	0.00%
40-45	171.4	4.50%	130-135	0.0	0.00%
45-50	113.1	3.00%	135-140	0.0	0.00%
50-55	75.2	2.00%	140-145	0.0	0.00%
55-60	53.5	1.40%	145-150	0.0	0.00%
60-65	39.5	1.00%	150-155	0.0	0.00%
65-70	28.4	0.70%	155-160	0.0	0.00%
70-75	18.5	0.50%	160-165	0.0	0.00%
75-80	9.9	0.30%	165-170	0.0	0.00%
80-85	2.7	0.10%	170-175	0.0	0.00%
85-90	0.1	0.00%	175-180	0.0	0.00%





**Goniophotometer Test (Cont'd)**  
**Intensity Data(cd)**

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831
1	6817	6810	6830	6824	6824	6824	6832	6828	6824	6820	6810	6814	6815	6799	6806	6801	6810
2	6789	6815	6825	6852	6858	6853	6856	6839	6816	6797	6783	6758	6756	6746	6760	6763	6784
3	6714	6745	6811	6849	6878	6880	6861	6824	6757	6688	6634	6593	6560	6556	6575	6611	6669
4	6591	6631	6728	6801	6842	6840	6814	6744	6661	6570	6482	6428	6391	6381	6409	6458	6536
5	6440	6556	6644	6739	6785	6778	6759	6678	6568	6461	6369	6302	6256	6236	6267	6333	6426
6	6244	6401	6535	6626	6688	6682	6644	6538	6428	6305	6186	6108	6059	6053	6093	6162	6276
7	6033	6159	6323	6434	6497	6502	6440	6326	6191	6038	5915	5821	5766	5752	5808	5882	6012
8	5789	5911	6076	6211	6279	6284	6213	6089	5931	5766	5624	5519	5461	5450	5497	5591	5733
9	5532	5681	5847	5983	6066	6062	6008	5865	5695	5509	5371	5257	5189	5189	5230	5323	5461
10	5272	5475	5620	5789	5869	5862	5806	5662	5483	5290	5140	5033	4969	4954	4993	5090	5254
11	5015	5234	5415	5570	5645	5652	5570	5420	5247	5060	4909	4797	4733	4725	4777	4863	5026
12	4746	4932	5150	5286	5375	5370	5288	5128	4948	4777	4630	4509	4457	4453	4510	4615	4765
13	4481	4640	4853	4980	5064	5064	4979	4820	4653	4483	4330	4216	4165	4158	4219	4314	4465
14	4223	4375	4563	4700	4765	4772	4697	4547	4371	4201	4057	3947	3896	3887	3940	4036	4182
15	3978	4140	4297	4439	4515	4512	4440	4299	4125	3952	3813	3717	3659	3655	3700	3790	3934
16	3742	3923	4063	4207	4278	4274	4207	4070	3904	3734	3602	3512	3454	3448	3490	3573	3715
17	3511	3699	3844	3978	4043	4044	3970	3834	3681	3525	3400	3310	3261	3257	3297	3376	3512
18	3291	3466	3626	3736	3798	3799	3724	3592	3447	3308	3189	3099	3061	3060	3102	3178	3306
19	3086	3233	3396	3491	3546	3546	3470	3342	3214	3088	2980	2887	2859	2856	2900	2977	3096
20	2894	3018	3169	3253	3303	3303	3236	3118	2996	2879	2777	2693	2664	2662	2708	2773	2884
25	2090	2204	2288	2352	2387	2383	2333	2253	2166	2077	2003	1944	1919	1926	1988	2008	2095
30	1469	1536	1594	1635	1659	1652	1614	1553	1488	1416	1359	1320	1305	1312	1346	1387	1456
35	969	1024	1070	1107	1128	1118	1081	1030	975	918	874	849	847	855	878	917	971
40	589	625	654	684	704	694	668	630	588	545	514	503	500	506	518	547	583
45	351	374	394	419	433	428	408	380	353	327	310	303	303	305	312	329	352
50	212	223	235	249	259	254	241	225	212	198	189	184	186	188	191	200	212
55	136	144	148	156	162	160	152	145	137	131	127	124	124	124	127	130	136
60	94	97	102	105	106	106	104	99	94	91	90	90	88	88	91	92	94
65	66	69	71	72	72	72	73	69	65	66	66	65	64	66	67	67	66
70	44	44	46	46	47	47	46	44	44	43	43	43	44	43	45	45	45
75	27	27	27	28	28	28	27	27	26	25	24	26	26	26	25	27	27
80	11	11	12	12	13	12	10	11	9	10	8	10	10	11	10	11	12
85	0	1	1	0	2	1	1	0	0	1	0	0	0	1	1	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





### THD and PF Test

<b>Model No.</b>	84534	<b>Sample ID.</b>	2524248
<b>Operate time (Min.)</b>	80	<b>Stabilization time (Min.)</b>	70

#### Test Method

1. The samples were tested according to the ANSI C82.77.
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 (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25	120.01	60	0.2487	29.11	0.9754	5.22%	Horizontal
25	277.00	60	0.1111	29.02	0.9429	9.90%	Horizontal



### In-Situ Temperature Measurement Test

<b>Model No.</b>	84534	<b>Sample ID.</b>	2524248
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#### Test Method

1. In-Situ Temperature Measurement Test is conducted according to the UL1598-2008.  
 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. Thermocouples were placed on the LED driver case in the locations specified by the manufacture if necessary. 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 (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.2	120.01	60	0.2487	29.11	0.9754	5.22%	Horizontal

#### Test Results (LEDs)

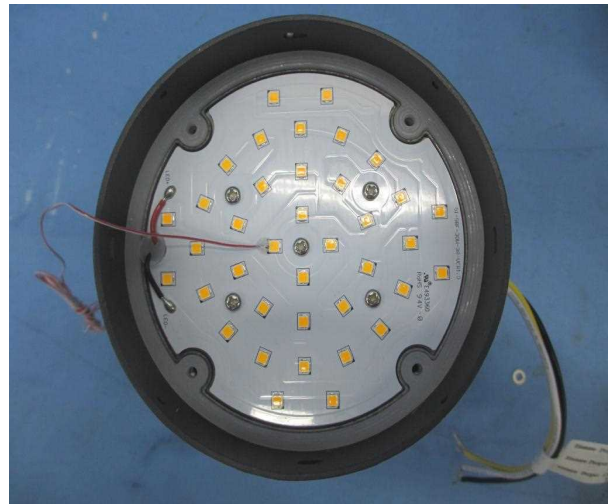
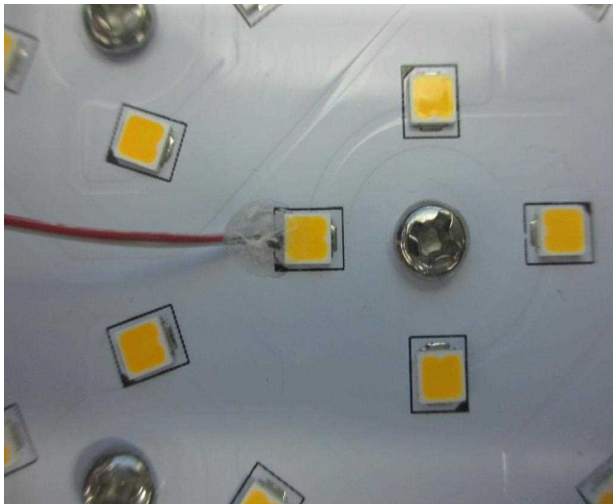
Thermocouple Location	Declared Light Source Current (mA)	Temperature for Light Source (°C)		LED Model Number	LM-80 Limit Current (mA)	LM-80 Limit Temp (°C)
		Test Result	Test Result (Correct to 25 °C)			
Ambient TEMP	N/A	25.2	25.0			
TMP of Location 1	150	68	67.8	SAW7C22B-NZ	150	105

#### Test Results (Drivers)

Thermocouple Location	Temperature for Driver (°C)		Driver Model Number	Driver Limit Temp (°C)
	Test Result	Test Result (Correct to 25 °C)		
Ambient TEMP	25.2	25.0		
TMP of Location 1	63.7	63.5	E030W-42-C0720	75

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

Test Photos for Ts Point of Light Sources & Tc Point of Drivers





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