



Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-10-2014
- ☐ UL1598-2008

Prepared For

Beyond LED Technology

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Catalog Number

ZPS-GC377-100W-40K-E1-D3-CM-110L50

(xx can be 30, 40, 50 to represent different CCT. Blank means without sensor; M1 means with sensor.)

Project Number

4790039590

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Revision Date

N/A

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1.0 Test Summary

☒ DLC Technical Requirements v5.1- issued 2020-02-14

Requirement Category	Test Method	Requirements	Test value
Minimum Light Output (lm)	IES LM-79-2008	$\geq 10,000$ (tolerance +10%)	16,148
Zonal Lumen Requirement (20°-50°)	IES LM-79-2008	$\geq 30\%$	51.8%
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	≥ 120 (tolerance -3%)	158.70
Allowable CCTs (3000K/5000K)	IES LM-79-2008 ANSI C78.377-2017	3045 ± 175 5029 ± 283	3073 5201
IES Rf	IES LM-79-2008 ANSI/IES TM-30-18	≥ 70 (tolerance -1 point)	84
IES Rg	IES LM-79-2008 ANSI/IES TM-30-18	≥ 89 (tolerance -1 point)	96
Allowable Rcs,h1	IES LM-79-2008 ANSI/IES TM-30-18	$-18\% \leq \text{IES Rcs,h1} \leq +23\%$ (tolerance +/- 1 point)	-12%
Minimum Ra	IES LM-79-2008 CIE 13.3-1995	≥ 70 (tolerance -1 point)	81
Minimum R9	IES LM-79-2008 CIE 13.3-1995	≥ 40 (tolerance -1 point)	-2
L70 Lumen maintenance (hours)	N/A	≥ 50000	>60000
Power Factor	ANSI C82.77-10-2014	≥ 0.9 (tolerance -3%)	0.925
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	$\leq 20\%$ (tolerance +5%)	12.09%



2.0 Test List

Test Item	Test	Sample ID	Sample Received Date	Test Date	Model Number	Tests Conducted By
1	Integrating Sphere Test	4092531	7/23/2021	7/23/2021	ZPS-GC377-100W.V7-30K-E1-D3-CM-110-L50	Joe Chen
2	Integrating Sphere Test	4092533	7/23/2021	7/26/2021	ZPS-GC377-100W.V7-50K-E1-D3-CM-110-L50	Joe Chen
3	Goniophotometer Test	4092531	7/23/2021	7/23/2021	ZPS-GC377-100W.V7-30K-E1-D3-CM-110-L50	Joe Chen
4	THD and PF Test	4092531	7/23/2021	7/23/2021	ZPS-GC377-100W.V7-30K-E1-D3-CM-110-L50	Joe Chen

Remark (if any)

- ☒ 1. UL test equipment information is recorded on Meter Use in UL's Aurora database.
2. The temperature measurement point of LED is referred to the LM-80 test report, which is provided by the customer.
3. The temperature measurement point for the hottest location on the driver case is provided by the driver manufacturer or the customer.



3.0 Product Description

Luminaire Description: High Bay Luminaires (Commercial and Industrial)

Model Number: ZPS-GC377-100W.V7-xxK-E1-D3-[Blank; M1]-CM-110-L50

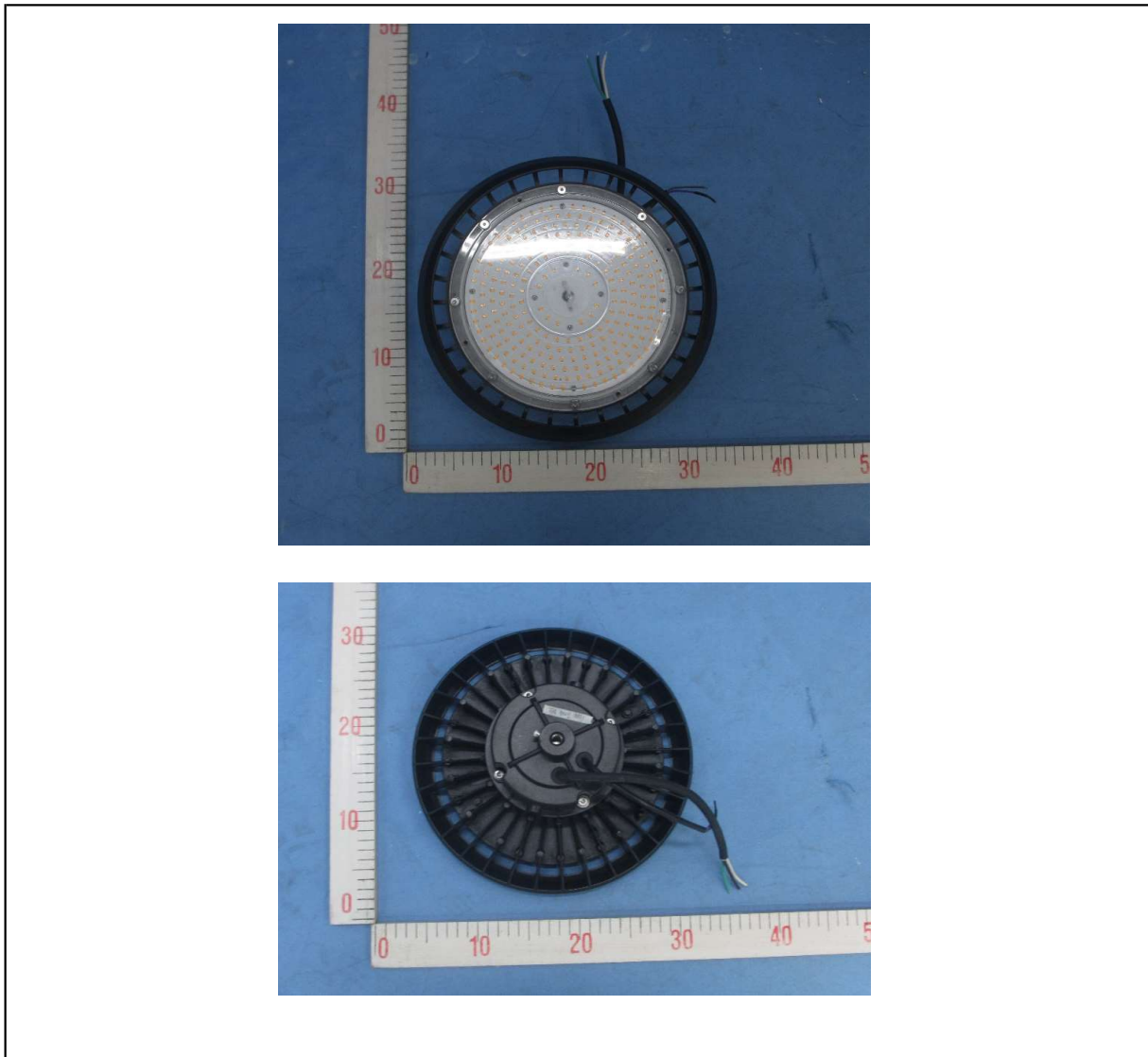
Electrical Ratings and CCT: 100-277 VAC, 50/60 Hz, 100 W, 3000K/4000K/5000K

LED Package: BXVN-XXE-21L-3FJ

Driver Model Number: G6-096M260

Family Model and Variation: ZPS-GC377-100W.V7-xxK-E1-D3-[Blank; M1]-CM-110-L50 (xx can be 30, 40, 50 to represent different CCT. Blank means without sensor; M1 means with sensor.)

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1.1 Integrating Sphere Test - 3000K

Model No.	ZPS-GC377-100W.V7-30K-E1-D3-CM-110-L50	Sample ID.	4092531
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-200 8, and the product is assume to be brand new without seasoning.

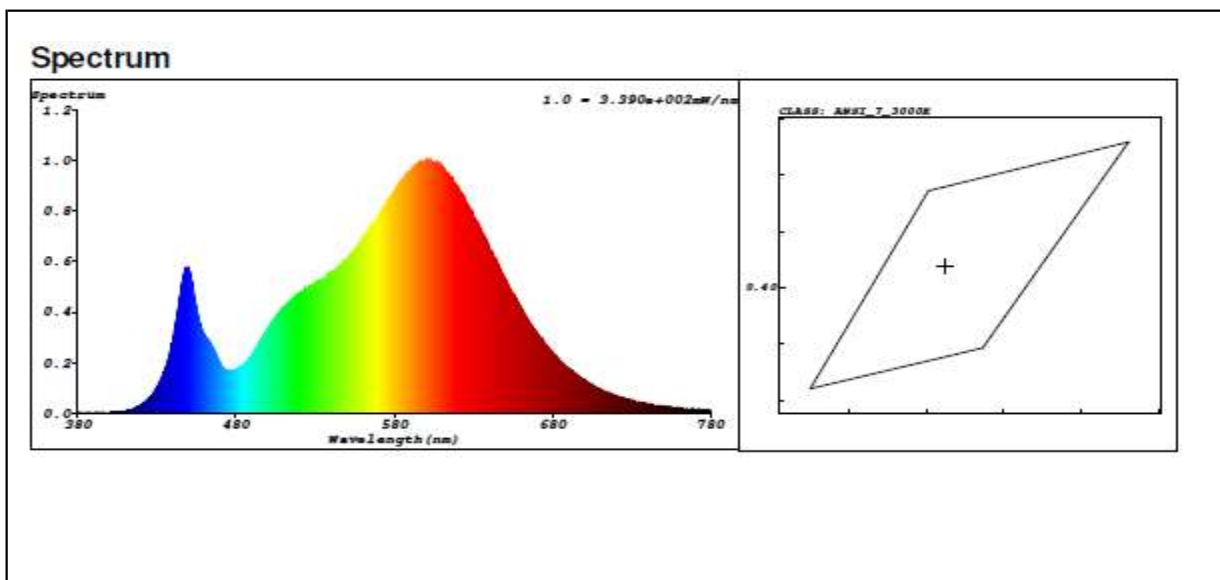
2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° C.The reference standard lamp is rated cu rrent 0.9013 A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.

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. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4 π geometry.The self-absorption factor is applied in the final test result.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 5 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Conditions and Results

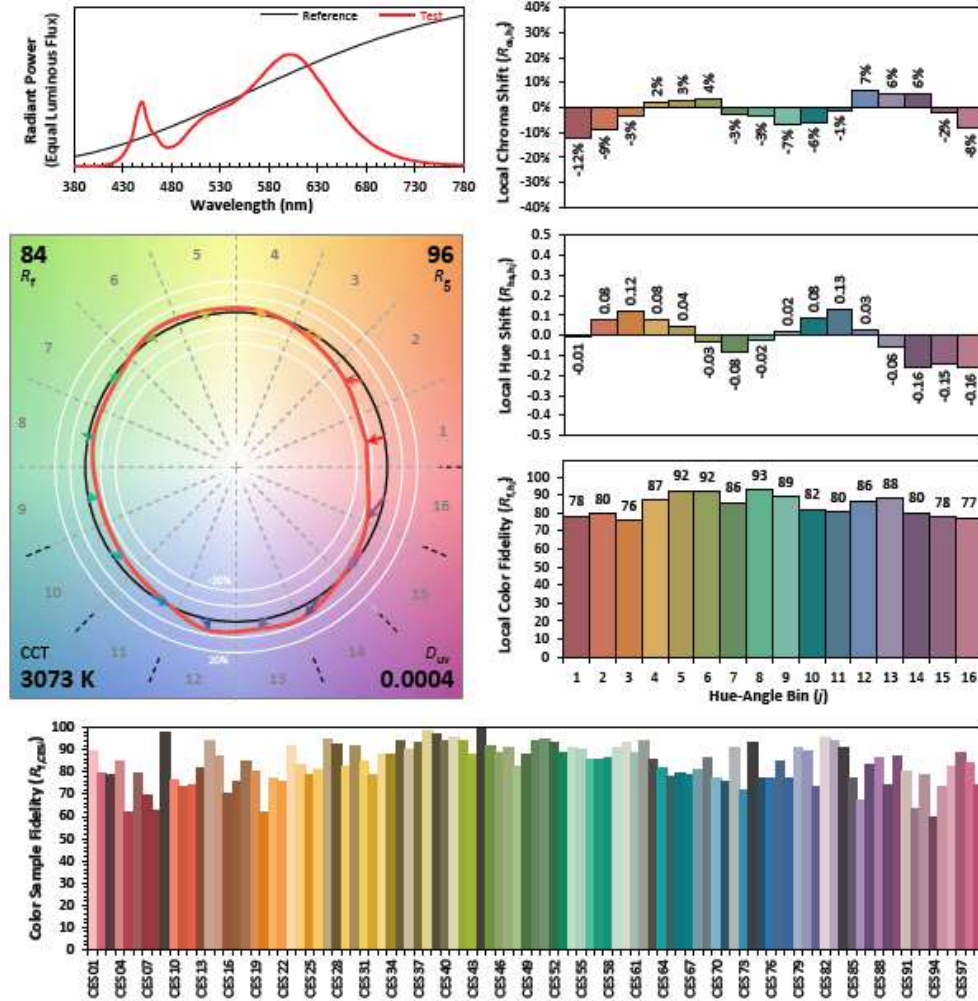
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.3	119.90	60	0.849	101.5	0.997	Horizontal

CCT (K)	CRI (Ra)	Rcs,h1	Rf	Rg	Luminous Flux(lm)	Luminous Efficacy (lm/W)
3073	81	-12%	84	96	16462.0	162.19





ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4324
 y 0.4035
 u' 0.2479
 v' 0.5205

CIE 13.3-1995
(CRI)

R_a 81
 R_g -2

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



4.0 LM-79 Measurement and Test Results

4.1.2 Integrating Sphere Test - 5000K

Model No.	ZPS-GC377-100W.V7-50K-E1-D3-CM-110-L50	Sample ID.	4092533
Operate time (Min.)	55	Stabilization time (Min.)	50

Test Method

1.The sample was tested according to the IES LM-79-200 8, and the product is assume to be brand new without seasoning.

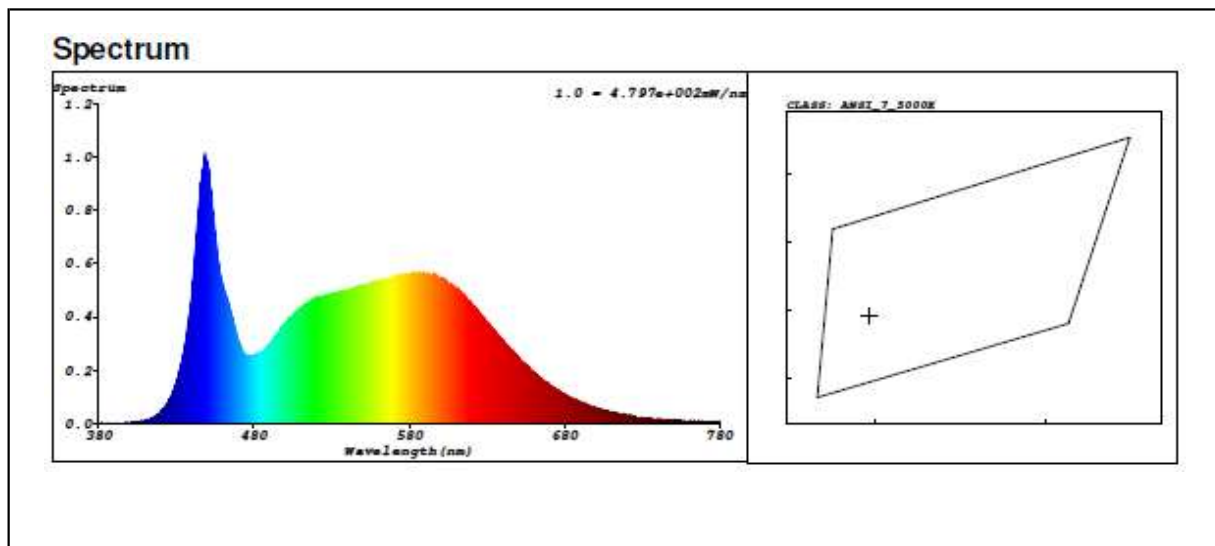
2.Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.The reference standard lamp is rated cu rrent 0.9013 A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.

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. Coating reflectance of the integrating sphere was 90% to 98%.Photometric measurement conditions was using 4π geometry.The self-absorption factor is applied in the final test result.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 5 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Conditions and Results

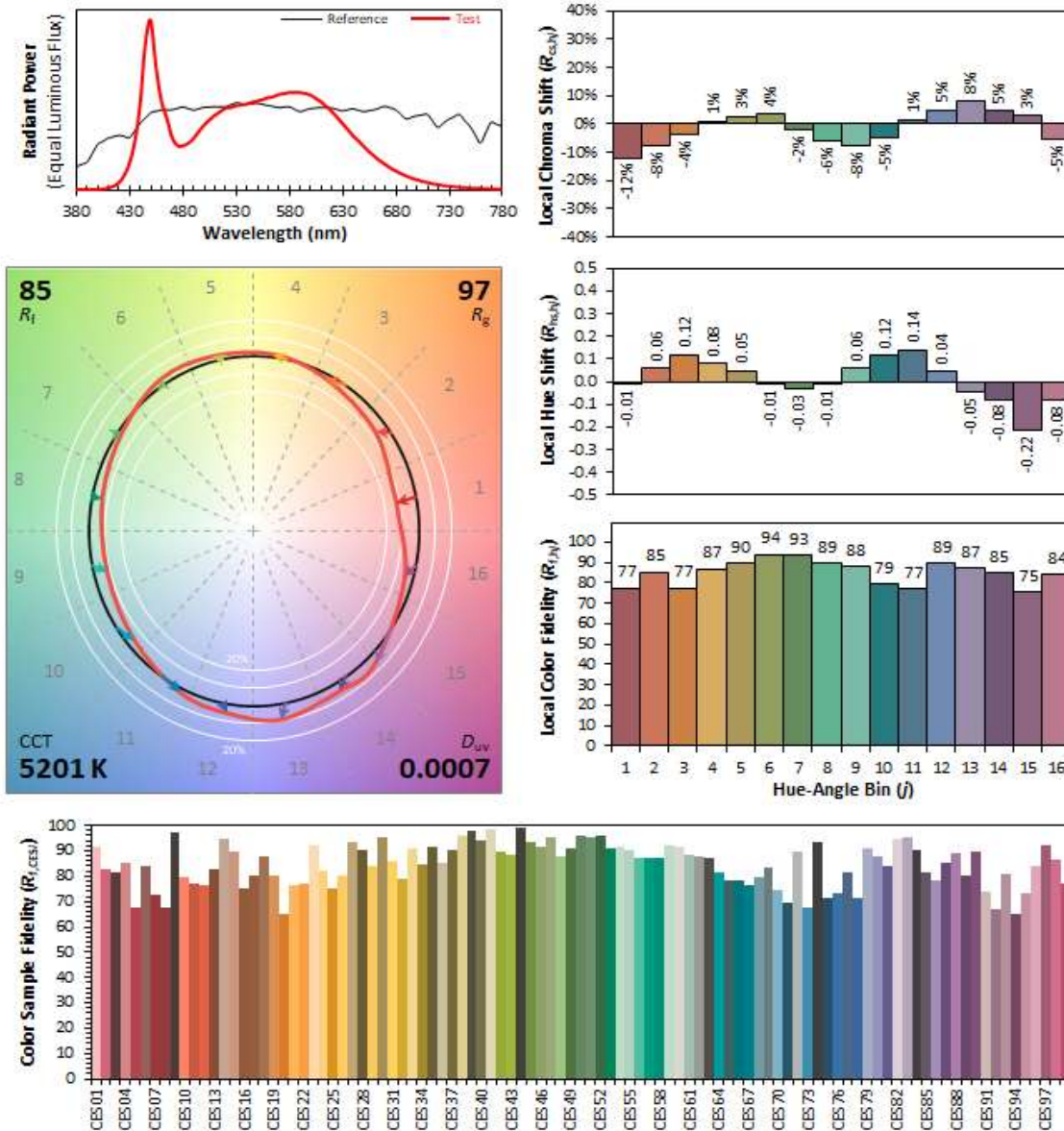
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.3	119.90	60	0.857	102.6	0.997	Horizontal

CCT (K)	CRI (Ra)	Rcs,h1	Rf	Rg	Luminous Flux(lm)	Luminous Efficacy (lm/W)
5201	84	-12%	85	97	16838.0	164.11





ANSI/IES TM-30-18 Color Rendition Report



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3398
 y 0.3487
 u' 0.2089
 v' 0.4825

CIE 13.3-1995
(CRI)

R_a 84
 R_g 10

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



5.0 LM-79 Goniophotometer Measurement and Test Results

5.1 Goniophotometer Test

Model No.	ZPS-GC377-100W.V7-30K-E1-D3-CM-110-L50	Sample ID.	4092531
Operate time (Min.)	70	Stabilization time (Min.)	60

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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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	Orientation
25.6	120.00	60	0.850	101.75	0.998	Horizontal

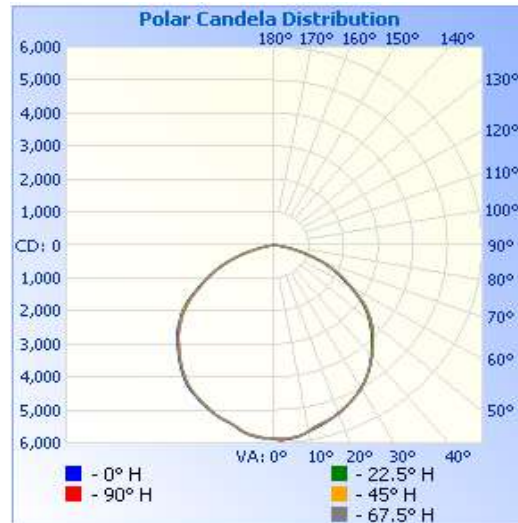
Test Result

Zonal Lumens (20-50°)	Field Angle (10%)		Beam Angle (50%)		Flux (lm)	Luminous Efficacy (lm/W)
	Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread		
51.8%	153.5	153.7	112.4	112.7	16147.5	158.70

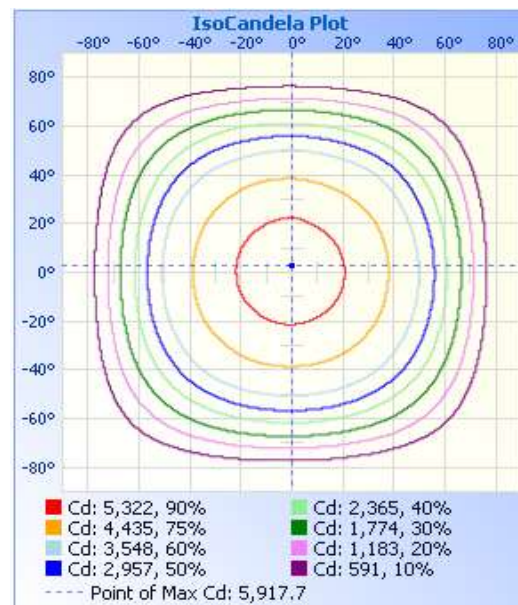


5.2 Goniophotometer Test (Cont'd)

Light Distribution Curve



IsoCandela Plot





5.3 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	4,505.4	27.9%
0-40	7,423.1	46%
0-60	13,233.2	82%
60-90	2,876.6	17.8%
70-100	934.9	5.8%
90-120	11.8	0.1%
0-90	16,109.8	99.8%
90-180	37.7	0.2%
0-180	16,147.5	100%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	139.9	0.9%	90-95	1.4	0%
5-10	413.0	2.6%	95-100	1.5	0%
10-15	663.5	4.1%	100-105	1.8	0%
15-20	898.4	5.6%	105-110	2.1	0%
20-25	1,105.9	6.8%	110-115	2.4	0%
25-30	1,284.7	8.0%	115-120	2.6	0%
30-35	1,419.2	8.8%	120-125	2.7	0%
35-40	1,498.6	9.3%	125-130	2.8	0%
40-45	1,530.2	9.5%	130-135	2.8	0%
45-50	1,524.4	9.4%	135-140	2.8	0%
50-55	1,457.7	9.0%	140-145	2.8	0%
55-60	1,297.8	8.0%	145-150	2.7	0%
60-65	1,087.6	6.7%	150-155	2.5	0%
65-70	856.9	5.3%	155-160	2.2	0%
70-75	569.7	3.5%	160-165	1.9	0%
75-80	279.2	1.7%	165-170	1.5	0%
80-85	76.8	0.5%	170-175	1.0	0%
85-90	6.4	0.0%	175-180	0.3	0%



3.3 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	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860	5860
1	5910	5887	5880	5876	5868	5865	5858	5855	5851	5848	5841	5842	5839	5835	5833	5830	5822
2	5918	5888	5879	5876	5869	5868	5863	5857	5852	5846	5843	5842	5837	5832	5833	5830	5822
3	5909	5888	5884	5881	5874	5873	5868	5864	5861	5854	5848	5843	5840	5835	5831	5825	5820
4	5897	5879	5872	5871	5868	5871	5867	5864	5857	5848	5842	5838	5829	5825	5820	5814	5808
5	5883	5866	5858	5856	5854	5853	5851	5846	5838	5829	5821	5820	5808	5810	5807	5805	5797
6	5867	5857	5843	5839	5837	5834	5831	5826	5822	5811	5802	5800	5790	5797	5796	5797	5786
7	5845	5839	5833	5821	5822	5815	5816	5805	5803	5792	5784	5783	5774	5775	5783	5784	5775
8	5813	5810	5808	5801	5800	5791	5788	5782	5774	5768	5762	5754	5747	5745	5760	5763	5755
9	5770	5765	5770	5766	5761	5757	5748	5747	5742	5734	5726	5714	5711	5698	5720	5715	5714
10	5737	5722	5722	5720	5716	5715	5704	5703	5694	5683	5673	5667	5662	5658	5672	5669	5666
11	5705	5686	5679	5676	5665	5668	5658	5655	5644	5635	5626	5620	5614	5616	5628	5630	5628
12	5674	5657	5638	5634	5625	5627	5615	5610	5603	5592	5580	5579	5573	5582	5593	5600	5593
13	5647	5632	5612	5602	5594	5589	5578	5570	5563	5551	5539	5544	5538	5554	5564	5574	5565
14	5618	5606	5586	5579	5569	5560	5550	5541	5532	5518	5511	5520	5513	5532	5536	5550	5542
15	5585	5581	5563	5554	5547	5531	5521	5515	5511	5491	5484	5497	5488	5505	5514	5530	5521
16	5556	5550	5541	5533	5527	5509	5500	5492	5488	5465	5459	5471	5464	5471	5491	5505	5498
17	5528	5517	5517	5511	5503	5486	5474	5467	5461	5440	5436	5442	5441	5440	5464	5477	5476
18	5500	5482	5487	5484	5475	5460	5444	5439	5430	5410	5407	5409	5411	5401	5431	5445	5444
19	5469	5449	5450	5452	5443	5426	5409	5404	5397	5375	5369	5370	5373	5368	5394	5406	5409
20	5437	5412	5417	5413	5404	5390	5368	5367	5357	5335	5330	5331	5332	5336	5355	5365	5368
25	5232	5236	5227	5230	5219	5211	5186	5186	5168	5140	5129	5142	5137	5153	5154	5171	5161
30	4999	4992	5021	5024	5020	5014	4989	4979	4963	4932	4924	4919	4923	4912	4942	4950	4951
35	4712	4715	4717	4729	4723	4722	4687	4679	4654	4631	4615	4608	4609	4620	4628	4638	4642
40	4350	4383	4376	4389	4388	4381	4348	4331	4304	4283	4263	4258	4255	4274	4272	4289	4287
45	3974	3988	4024	4025	4034	4030	3982	3950	3935	3918	3900	3898	3890	3922	3938	3924	
50	3589	3585	3639	3657	3654	3632	3622	3600	3566	3544	3529	3485	3502	3475	3558	3543	3553
55	3131	3122	3182	3211	3213	3173	3158	3151	3113	3082	3063	3027	3010	2991	3054	3063	3085
60	2523	2581	2607	2621	2618	2606	2586	2537	2504	2476	2430	2444	2408	2422	2458	2476	2485
65	1975	2032	2041	2053	2070	2063	2045	1989	1959	1937	1888	1883	1878	1877	1925	1944	1952
70	1425	1433	1471	1505	1508	1494	1472	1455	1408	1388	1360	1290	1286	1283	1355	1351	1403
75	796	790	863	885	884	888	852	827	790	760	728	676	676	665	729	748	780
80	298	304	352	354	352	362	341	317	300	267	245	239	218	226	261	278	290
85	36	47	51	57	55	56	51	44	36	30	26	21	19	23	27	30	35
90	3	3	3	3	3	2	3	3	3	2	2	3	2	3	3	2	3
95	3	3	3	3	3	2	3	3	3	2	2	3	2	3	3	2	3
100	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
105	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4
110	4	4	4	4	4	4	4	4	5	4	4	4	5	5	5	4	5
115	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
120	5	5	5	5	5	5	6	6	6	6	5	6	6	6	5	5	6
125	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
130	7	7	6	6	6	6	7	7	7	7	7	7	7	7	6	6	7
135	8	7	7	7	7	7	7	8	8	8	7	7	8	7	7	7	7
140	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
145	9	9	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9
150	10	9	9	10	10	9	9	10	9	10	10	10	10	10	9	10	9
155	10	10	10	10	10	10	10	10	10	10	10	10	10	11	10	11	10
160	11	11	11	11	11	11	11	11	11	11	11	11	12	11	11	11	11
165	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
170	13	13	13	13	13	13	13	13	13	13	14	13	13	13	14	13	13
175	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
180	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15



6.0 THD and PF Test

Test Method

1. The samples were tested according to the ANSI C82.77.
2. The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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

Model No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD
ZPS-GC377- 100W.V7-30K-E1- D3-CM-110-L50	120.00	60	0.850	101.75	0.998	2.79%
	277.00	60	0.388	99.31	0.925	12.09%



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