

LM-79-08 Test Report

LED LAMP

Model name(s): **LF3-220W**

Remark: The letter "X" in the model name stand for CCT as bellow :3=3000K, 4=4000K, 5=5000K; "YY" stand for different mounting pole as bellow YK=Yoke, TR=Trunnion, SF=Slipfitter, MA=Arm, PD=Pendant; "ZZ" stand for housing color by use 2 digits to indicate all of color.

Representative (Tested) Model: **LF3-220W**

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Date: July.09,2015

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: 8th floor, Block B, No. 11 Caipin Road, Guangzhou Science City, Tianhe, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template
Laboratory Information:

Name of Test Laboratory	Standard-Tech Co. Ltd
Date of Test Report	July.09,2015
Test Report No.	GZE150320-I
Laboratory Contact Name	Tommy Liang

Product Information:

Model Number	LF3-220W	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED LAMP	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Integrating Sphere
Goniophotometer
Electrical Measurements:
Output
Output

Input Wattage	--	223.0	W
Input Current	--	1.867	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9945	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	21578	lm
Initial Lumen Efficacy	--	96.75	lm/w
Correlated color temperature / CCT	3110	--	K
Color rendering index / CRI	83.6	--	
R9 Value	12	--	
Duv	-0.0006	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	7386	cd
Beam angle (if applicable)		108.2	°
Zonal lumens in the 0 °-60 °zone		78.4	%
Zonal lumens in the 60 °-90 °zone		21.4	%
Zonal lumens in the 90 °-120 °zone		0.1	%
Zonal lumens in the 120 °-180 °zone		0.1	%

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Product Information:

Model Number	LF3-220W	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED LAMP	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Integrating Sphere
Goniophotometer
Electrical Measurements:
Output
Output

Input Wattage	219.9	--	W
Input Current	1.840	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9953	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	25684	--	lm
Initial Lumen Efficacy	116.82	--	lm/w
Correlated color temperature / CCT	5132	--	K
Color rendering index / CRI	84.7	--	
R9 Value	15	--	
Duv	0.0016	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	-----	cd
Beam angle (if applicable)			°
Zonal lumens in the 0 °-60 °zone			%
Zonal lumens in the 60 °-90 °zone			%
Zonal lumens in the 90 °-120 °zone			%
Zonal lumens in the 120 °-180 °zone			%

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Test Specifications:	
Date of Receipt	: Jun.24,2015
Date of Test	: July.09,2015
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. 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 sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

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 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 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

1. Product Information:

Model Number	LF3-220W
Luminaire Type	LED LAMP
Rated Voltage / Frequency	120~ 277Vac, 50/60Hz
Nominal Power	220W
Rated Initial Lamp Lumen	--
Declared CCT	3000K, 4000K, 5000K,
LED Manufacturer	Philips Lumileds
LED Model	LUXEON 3030 2D
Sample Receipt Date	Jun.24,2015
Sample Number	GZE150320-I1(3000K),I2(5000K)

Photo



2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-07-03	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150320	120.0	60	1.867	223.0	0.9945	15.62
-I1	277.0	60	0.8381	216.0	0.9301	18.31

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	83.6
R9	12
CCT (K)	3110
Chromaticity (x, y)	x=0.4284 y=0.3995
Chromaticity (u', v')	u'=0.2471 v'=0.5183
Duv	-0.0006

Special Color Rendering Indices			
R1	82	R9	12
R2	92	R10	82
R3	96	R11	81
R4	81	R12	73
R5	83	R13	85
R6	90	R14	99
R7	83	R15	75
R8	61	--	--

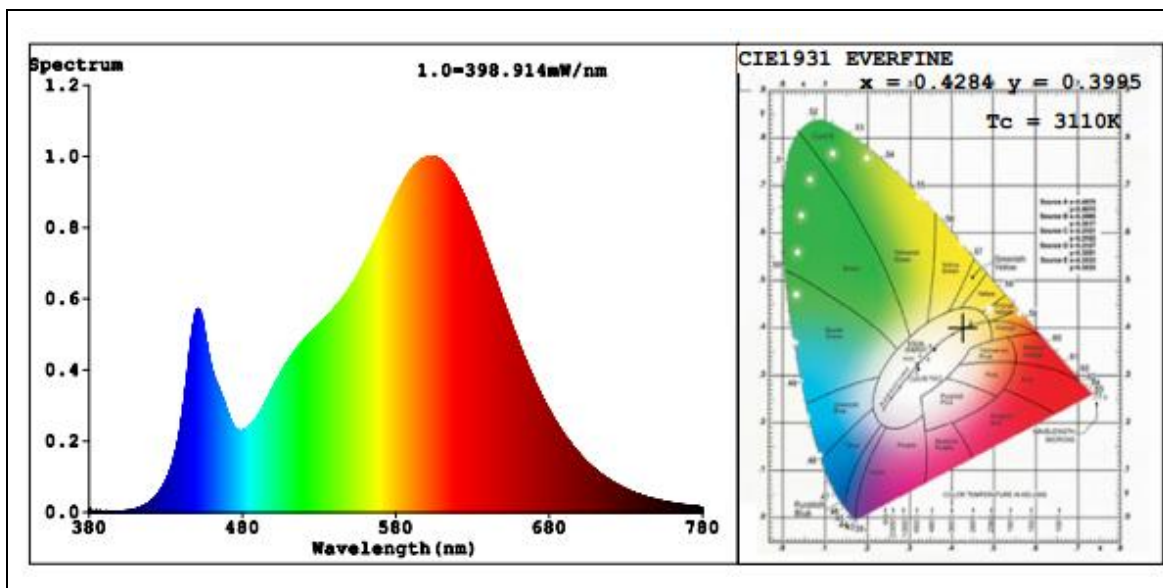
Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	21578
Luminous Efficacy (lm/W)	96.75
Beam Angle °	108.2
Center Beam Candle Power (cd)	7386

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	21495
Luminous Efficacy (lm/W)	99.51

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5,454.5	25.3%
0-40	9,101.5	42.2%
0-60	16,908.5	78.4%
60-90	4,606.3	21.4%
70-100	1,783.1	8.3%
90-120	15.9	0.1%
0-90	21,514.8	99.7%
90-180	59.7	0.3%
0-180	21,574.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	692.4	3.2%	90-100	3.3	0%
10-20	1,915.0	8.9%	100-110	5.2	0%
20-30	2,847.1	13.2%	110-120	7.4	0%
30-40	3,647.0	16.9%	120-130	9.7	0%
40-50	3,989.0	18.5%	130-140	10.9	0.1%
50-60	3,818.0	17.7%	140-150	9.5	0%
60-70	2,826.4	13.1%	150-160	7.3	0%
70-80	1,358.7	6.3%	160-170	4.5	0%
80-90	421.1	2.0%	170-180	1.7	0%

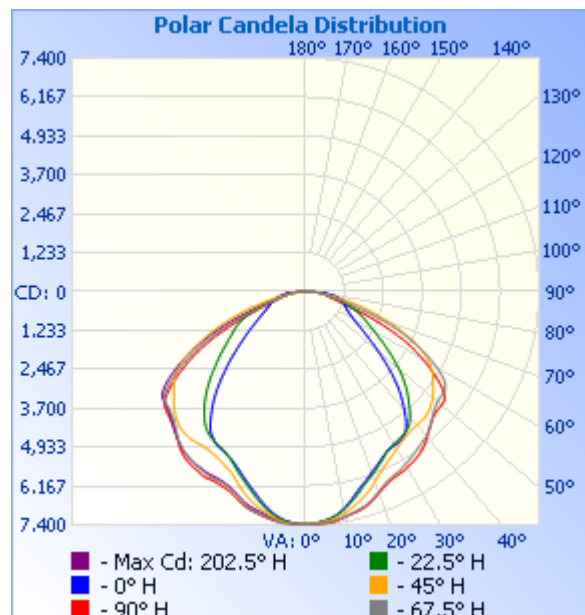
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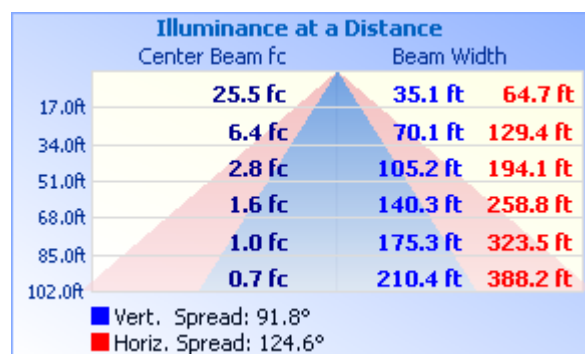
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Photometric Data



Illuminance Plots



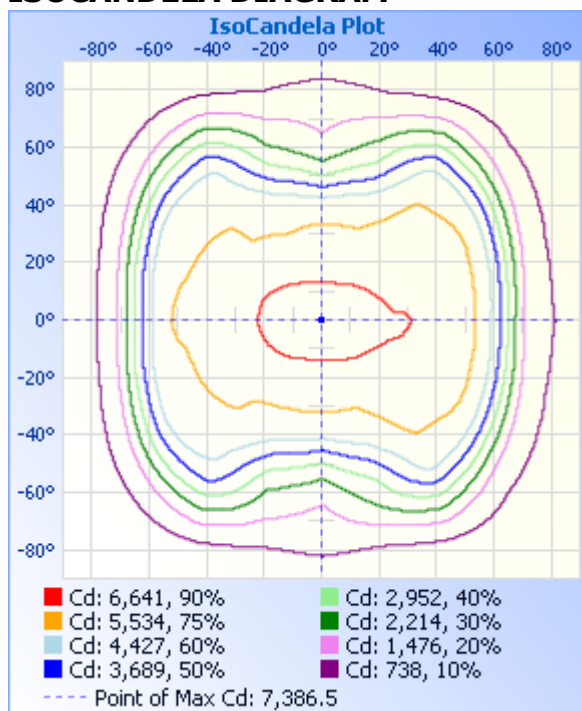
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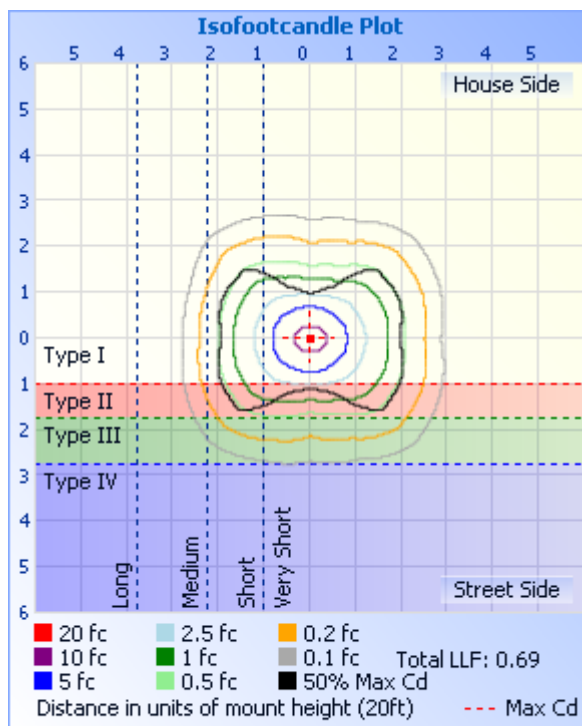
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ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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Candela Table - Type C

	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	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379	7379
1	7366	7364	7368	7375	7376	7378	7379	7383	7385	7386	7385	7379	7381	7376	7374	7369	7366
2	7353	7353	7359	7369	7374	7374	7374	7374	7375	7380	7385	7380	7375	7365	7361	7355	7353
3	7334	7336	7347	7362	7377	7367	7362	7351	7348	7361	7379	7382	7371	7355	7349	7336	7334
4	7306	7307	7331	7356	7378	7362	7341	7319	7318	7336	7366	7381	7365	7343	7331	7307	7306
5	7279	7277	7311	7350	7373	7356	7318	7286	7285	7305	7344	7377	7357	7329	7308	7276	7279
6	7243	7247	7287	7338	7363	7339	7293	7247	7244	7265	7315	7366	7347	7310	7281	7243	7243
7	7191	7203	7261	7319	7348	7313	7256	7200	7191	7219	7283	7346	7336	7291	7249	7201	7191
8	7133	7146	7225	7294	7320	7277	7211	7146	7122	7164	7235	7314	7318	7265	7212	7143	7133
9	7061	7085	7179	7265	7285	7235	7163	7072	7043	7096	7186	7282	7292	7229	7163	7081	7061
10	6979	7012	7126	7230	7250	7201	7110	6999	6957	7025	7130	7255	7264	7189	7106	7007	6979
11	6889	6933	7074	7199	7217	7174	7050	6915	6869	6942	7075	7229	7233	7153	7046	6922	6889
12	6794	6848	7014	7170	7189	7141	6989	6830	6778	6853	7018	7199	7201	7121	6983	6833	6794
13	6694	6759	6953	7137	7166	7108	6925	6742	6684	6764	6963	7167	7172	7092	6916	6740	6694
14	6590	6670	6884	7103	7137	7069	6860	6652	6586	6670	6898	7128	7143	7054	6852	6644	6590
15	6495	6575	6820	7062	7100	7026	6800	6564	6495	6573	6830	7071	7109	7010	6784	6553	6495
16	6406	6479	6752	7019	7057	6971	6733	6480	6410	6479	6754	7001	7059	6959	6716	6465	6406
17	6332	6395	6677	6963	7002	6911	6660	6400	6322	6394	6673	6928	7001	6899	6644	6379	6332
18	6263	6321	6596	6899	6938	6841	6572	6319	6238	6315	6583	6854	6938	6831	6567	6299	6263
19	6189	6250	6505	6827	6866	6768	6478	6237	6151	6230	6495	6786	6873	6764	6480	6230	6189
20	6110	6181	6415	6755	6794	6690	6392	6157	6074	6143	6404	6721	6814	6704	6394	6159	6110
21	6043	6113	6324	6685	6728	6616	6308	6076	6000	6061	6312	6675	6767	6653	6310	6093	6043
22	5977	6039	6235	6613	6672	6549	6226	6001	5933	5978	6231	6642	6738	6613	6232	6022	5977
23	5912	5964	6156	6555	6621	6490	6153	5938	5865	5901	6170	6620	6716	6580	6164	5953	5912
24	5844	5897	6086	6513	6575	6448	6082	5875	5808	5828	6126	6609	6699	6558	6114	5893	5844
25	5782	5827	6023	6475	6541	6412	6021	5817	5767	5770	6082	6611	6684	6548	6068	5832	5782
26	5726	5760	5965	6444	6514	6385	5958	5771	5730	5716	6038	6613	6675	6547	6032	5772	5726
27	5681	5697	5918	6422	6498	6354	5899	5736	5693	5676	5993	6603	6677	6544	6001	5714	5681
28	5658	5648	5867	6395	6484	6324	5844	5703	5666	5646	5958	6588	6686	6540	5970	5665	5658
29	5638	5608	5813	6360	6464	6286	5789	5665	5643	5617	5931	6570	6683	6533	5943	5629	5638

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30	5625	5581	5759	6320	6436	6252	5743	5629	5614	5593	5914	6553	6662	6523	5920	5605	5625
31	5618	5558	5715	6285	6409	6220	5694	5596	5572	5564	5899	6535	6641	6505	5897	5585	5618
32	5605	5537	5676	6248	6380	6190	5655	5557	5514	5536	5890	6513	6621	6493	5883	5566	5605
33	5576	5517	5637	6210	6353	6164	5621	5512	5451	5505	5886	6491	6598	6475	5873	5553	5576
34	5539	5497	5605	6172	6324	6134	5594	5453	5374	5465	5884	6464	6573	6458	5874	5535	5539
35	5487	5470	5571	6133	6288	6104	5575	5387	5271	5423	5891	6435	6545	6434	5873	5509	5487
36	5405	5440	5547	6094	6247	6076	5556	5316	5145	5358	5905	6400	6510	6409	5880	5473	5405
37	5299	5397	5529	6059	6193	6041	5534	5222	4999	5284	5915	6366	6465	6380	5889	5430	5299
38	5166	5336	5518	6021	6136	6006	5517	5117	4847	5199	5921	6331	6409	6341	5896	5360	5166
39	5014	5249	5507	5991	6068	5970	5508	4989	4703	5103	5923	6280	6343	6299	5913	5276	5014
40	4856	5154	5504	5978	5995	5929	5499	4854	4549	4999	5915	6229	6262	6256	5927	5168	4856
41	4709	5038	5500	5925	5921	5877	5485	4726	4384	4899	5902	6169	6193	6196	5929	5049	4709
42	4551	4915	5497	5870	5853	5818	5459	4596	4213	4790	5884	6095	6113	6137	5923	4934	4551
43	4389	4796	5492	5809	5793	5751	5416	4466	4041	4673	5855	6020	6054	6075	5918	4822	4389
44	4219	4684	5480	5747	5740	5681	5366	4327	3866	4554	5818	5949	6001	6020	5895	4717	4219
45	4032	4566	5460	5679	5692	5608	5313	4183	3685	4430	5776	5884	5954	5958	5857	4602	4032
46	3846	4445	5434	5621	5657	5541	5254	4038	3515	4304	5726	5827	5920	5900	5820	4487	3846
47	3649	4314	5400	5559	5631	5476	5191	3891	3350	4178	5667	5781	5884	5843	5769	4348	3649
48	3457	4185	5357	5514	5619	5418	5119	3745	3186	4051	5606	5745	5859	5795	5715	4215	3457
49	3269	4042	5312	5477	5614	5370	5045	3596	3021	3918	5540	5716	5822	5750	5656	4069	3269
50	3089	3898	5263	5450	5614	5337	4960	3454	2863	3786	5460	5691	5794	5723	5591	3931	3089
51	2921	3748	5204	5432	5608	5320	4886	3313	2718	3660	5383	5675	5746	5698	5517	3783	2921
52	2744	3597	5135	5422	5584	5315	4808	3171	2580	3540	5306	5657	5679	5678	5448	3640	2744
53	2585	3450	5067	5424	5517	5321	4739	3040	2449	3423	5237	5614	5560	5661	5382	3499	2585
54	2434	3294	4995	5424	5404	5323	4674	2914	2327	3306	5169	5521	5394	5614	5309	3360	2434
55	2297	3159	4930	5405	5260	5302	4607	2793	2212	3188	5104	5383	5217	5532	5237	3224	2297
56	2168	3014	4864	5341	5089	5244	4547	2677	2100	3076	5031	5223	5008	5401	5162	3097	2168
57	2054	2879	4802	5261	4903	5154	4488	2565	1997	2976	4947	5039	4827	5237	5073	2972	2054
58	1946	2746	4724	5131	4702	5027	4427	2463	1900	2880	4845	4841	4583	5059	4966	2852	1946
59	1848	2629	4635	4987	4498	4882	4349	2364	1813	2790	4712	4620	4386	4852	4848	2742	1848
60	1767	2512	4544	4811	4293	4715	4268	2272	1734	2708	4566	4385	4133	4653	4711	2637	1767

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61	1702	2406	4427	4616	4083	4530	4167	2188	1657	2630	4399	4149	3912	4418	4542	2539	1702
62	1638	2314	4300	4412	3867	4328	4044	2108	1587	2555	4216	3908	3648	4196	4365	2450	1638
63	1579	2223	4152	4189	3645	4108	3910	2037	1521	2479	4020	3666	3379	3956	4162	2364	1579
64	1529	2135	3997	3975	3381	3894	3755	1962	1462	2400	3824	3403	3105	3714	3955	2274	1529
65	1484	2052	3816	3746	3116	3665	3589	1890	1407	2310	3616	3139	2802	3462	3743	2183	1484
66	1448	1970	3635	3520	2851	3426	3397	1819	1357	2214	3407	2875	2530	3197	3519	2083	1448
67	1415	1887	3435	3270	2566	3187	3205	1746	1312	2114	3198	2593	2226	2935	3288	1982	1415
68	1385	1805	3230	3028	2276	2947	3013	1670	1269	2000	2989	2313	1976	2647	3068	1882	1385
69	1357	1720	3022	2774	1999	2677	2813	1590	1235	1884	2776	2041	1709	2379	2838	1787	1357
70	1333	1634	2803	2513	1748	2417	2613	1508	1203	1762	2568	1789	1517	2093	2618	1685	1333
71	1313	1549	2601	2242	1516	2143	2415	1425	1176	1636	2357	1560	1326	1844	2404	1583	1313
72	1296	1461	2390	1980	1324	1885	2217	1341	1151	1511	2148	1361	1184	1636	2193	1481	1296
73	1281	1368	2190	1726	1162	1640	2022	1256	1127	1387	1935	1188	1064	1429	1988	1381	1281
74	1267	1279	1985	1516	1037	1420	1836	1173	1103	1265	1730	1047	971	1223	1783	1282	1267
75	1249	1191	1800	1306	935	1227	1648	1087	1078	1148	1530	928	898	1075	1606	1188	1249
76	1230	1106	1622	1126	856	1060	1469	1006	1050	1039	1342	835	840	949	1428	1099	1230
77	1209	1026	1444	975	795	924	1294	922	1012	934	1169	758	801	849	1251	1014	1209
78	1185	947	1266	856	748	806	1125	836	966	832	1008	701	772	765	1085	935	1185
79	1127	871	1102	759	716	715	967	751	900	734	864	656	756	695	942	860	1127
80	1049	782	952	684	692	635	819	666	860	633	731	616	746	639	806	766	1049
81	1010	693	806	623	675	574	675	595	796	559	614	574	739	593	685	688	1010
82	959	630	682	570	657	523	551	516	715	477	500	542	726	559	572	628	959
83	851	560	555	516	634	471	446	446	626	407	402	519	706	522	466	547	851
84	782	483	449	471	598	420	351	382	583	339	315	501	673	483	379	480	782
85	678	411	355	437	555	376	261	332	511	294	240	484	626	451	299	403	678
86	629	358	278	409	477	336	209	228	325	203	186	433	562	417	231	358	629
87	464	303	207	360	290	234	123	119	124	108	97	286	453	378	182	278	464
88	273	188	158	283	65	67	26	11	12	11	14	28	230	262	120	169	273
89	62	78	61	114	5	5	4	3	4	4	4	4	16	44	32	41	62
90	5	5	5	4	4	4	4	3	3	3	4	4	3	3	3	3	5
91	3	2	2	2	4	4	4	3	3	3	4	4	2	2	2	2	3

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92	2	2	2	2	3	4	4	3	3	3	4	4	3	2	2	2	2
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123	16	8	9	10	11	11	9	8	10	9	10	12	10	9	9	8	16
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152	24	18	13	12	16	15	15	17	19	17	19	16	13	11	13	17	24
153	21	17	14	12	16	15	15	17	17	18	19	16	13	12	13	16	21

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154	20	17	14	12	16	15	15	17	18	18	19	16	13	12	13	16	20
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BUG Rating: B4-U3-G3

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	2730.4	12.7
FM - Front-Medium(30-60)	5809.9	26.9
FH - Front-High(60-80)	2135.4	9.9
FVH - Front-Very High(80-90)	237.96	1.1
Total Forward Light	10942	50.7

BL - Back-Low(0-30)	2724.4	12.6
BM - Back-Medium(30-60)	5647.1	26.2
BH - Back-High(60-80)	2049.7	9.5
BVH - Back-Very High(80-90)	183.13	0.8
Total Back Light	10636	49.3

UL - Uplight-Low(90-100)	3.4057	0.0
UH - Uplight-High(100-180)	56.398	0.3
Total Up Light	59.803	0.3

BUG(Back,Up,Glare) Rating	B4-U3-G3
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Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	10914	27.969	10942
Street Side	10604	31.834	10636

2.2 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-07-03	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90

Electrical Measurement:

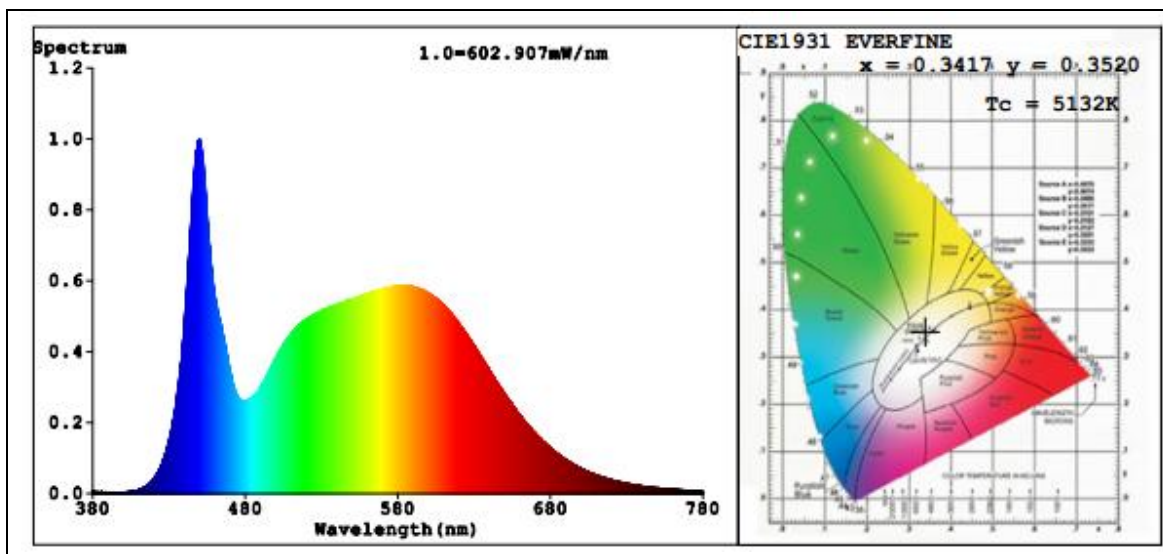
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150320	120.0	60	1.840	219.9	0.9953	15.85
-I2	277.0	60	0.8391	215.6	0.9276	19.02

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	84.7
R9	15
CCT (K)	5132
Chromaticity (x, y)	x=0.3417 y=0.3520
Chromaticity (u', v')	u'=0.2090 v'=0.4844
Duv	0.0016
Total Luminous (lm)	25684
Luminous Efficacy (lm/W)	116.82

Special Color Rendering Indices			
R1	83	R9	15
R2	89	R10	74
R3	93	R11	85
R4	85	R12	66
R5	84	R13	85
R6	85	R14	96
R7	88	R15	78
R8	70	--	--

Spectral Power Distribution & Chromaticity Diagram



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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF DATASHEET PACKAGE *******

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