



Report No.: GZE150406-G

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

PREMIUM QUALITY LIGHTING

(Brand Name: SUPERIOR LIFE®)

2285 Ward Avenue, Simi Valley, CA 93065

Outdoor Pole/Arm-Mounted Area and Roadway Luminaires

Model name(s): 83505

Representative (Tested) Model: 83503(3000K)
83505(5000K)

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

Test & Report By:

Sean Zhuo

Engineer: Sean Zhuo

Date: May.12,2015

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	May.12,2015
Test Report No.	GZE150406-G
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	PREMIUM QUALITY LIGHTING	
Brand Name	SUPERIOR LIFE®	
Model Number	83503 (3000K)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
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

	Integrating Sphere	Goniophotometer	
Input Wattage	--	22.58	W
Input Current	--	0.1911	A
Input Voltage (ac)	--	120.1	V
Power Factor	--	0.9845	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	2179.0	lm
Initial Lumen Efficacy	--	96.49	lm/w
Correlated color temperature / CCT	3112	--	K
Color rendering index / CRI	74.1	--	
R9 Value	0	--	
Duv	0.0010	--	

Luminous Intensity Distribution

Center beam candlepower (if applicable)	-----	2009	cd
Beam angle (if applicable)		85.2	°
Zonal lumens in the 0°-60° zone		92.5	%
Zonal lumens in the 60°-90° zone		7.5	%
Zonal lumens in the 90°-120° zone		0	%
Zonal lumens in the 120°-180° zone		0	%

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Product Information:

Organization Name	PREMIUM QUALITY LIGHTING	
Brand Name	SUPERIOR LIFE®	
Model Number	83505 (5000K)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
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	22.32	--	W
Input Current	0.1884	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9873	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	2274	--	lm
Initial Lumen Efficacy	101.88	--	lm/w
Correlated color temperature / CCT	5240	--	K
Color rendering index / CRI	75.4	--	
R9 Value	0	--	
Duv	-0.0008	--	

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	: Apr.14,2014
Date of Test	: Apr.21,2014
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.

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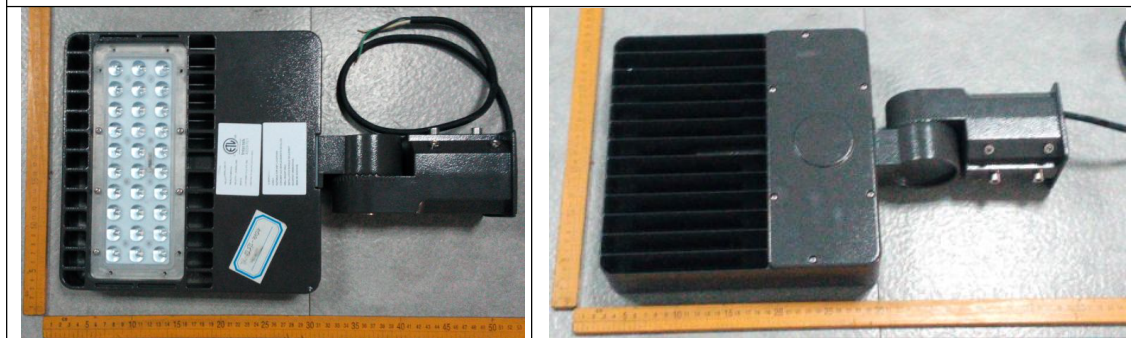
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1. Product Information:

Brand Name	SUPERIOR LIFE®
Model Number	83505
Luminaire Type	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires
Rated Voltage / Frequency	110 ~ 240/277Vac, 50/60Hz
Nominal Power	24W
Rated Initial Lamp Lumen	--
Declared CCT	3000K,3500K,4000K,4500K,5000K
LED Manufacturer	SAMSUNG ELECTRONICS Co.,Ltd
LED Model	LH351B
Sample Receipt Date	Apr.14,2015
Sample Number	GZE150406-G1(3000K),G2(5000K)

Photo


2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-04-21	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	83503 (3000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150406	120.1	60	0.1911	22.58	0.9845	11.66
-G1	277.1	60	0.0887	22.34	0.9085	19.70

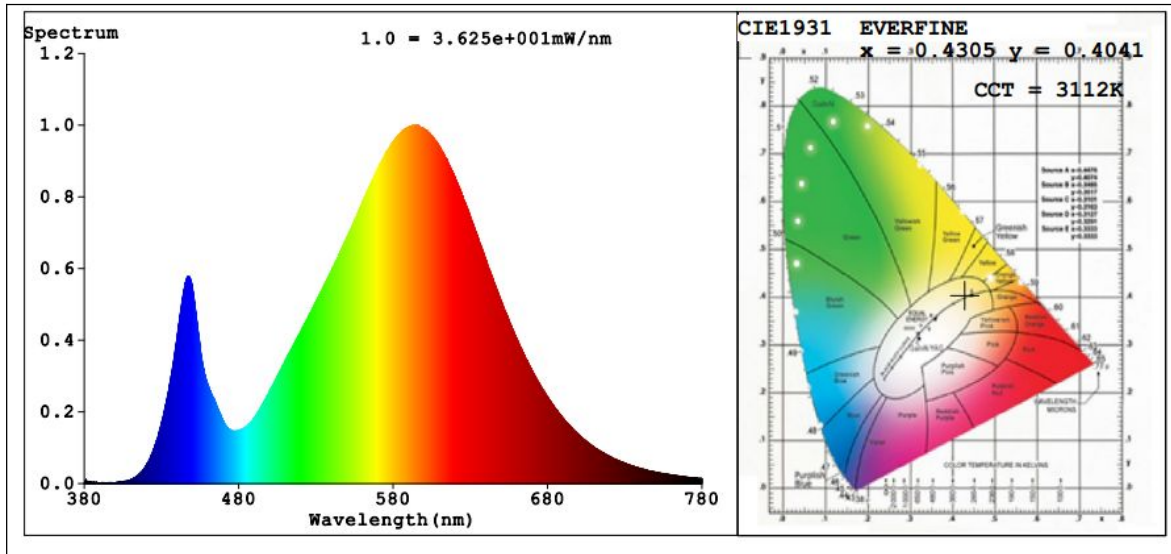
Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	70	R9	0
Frequency (Hz)	60	R2	83	R10	61
Color Rendering Index (CRI)	74.1	R3	94	R11	65
R9	0	R4	70	R12	54
CCT (K)	3112	R5	70	R13	73
Chromaticity (x, y)	x=0.4305 y=0.4041	R6	76	R14	96
Chromaticity (u', v')	u'=0.2464 v'=0.5205	R7	80	R15	64
Duv	0.0010	R8	49	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	2179.0
Luminous Efficacy (lm/W)	96.49
Beam Angle°	85.2
Center Beam Candle Power (cd)	2009
S/MH(C0/180)	1.76
S/MH(C90/270)	0.65

Spectral Power Distribution & Chromaticity Diagram



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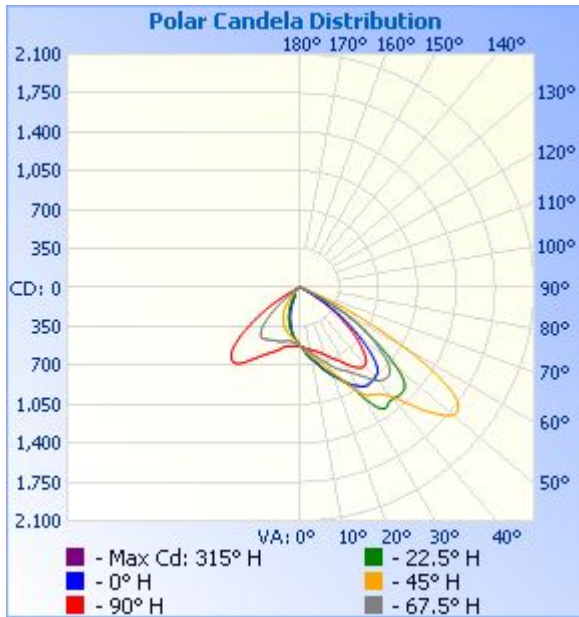
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Zonal Lumen Tabulation

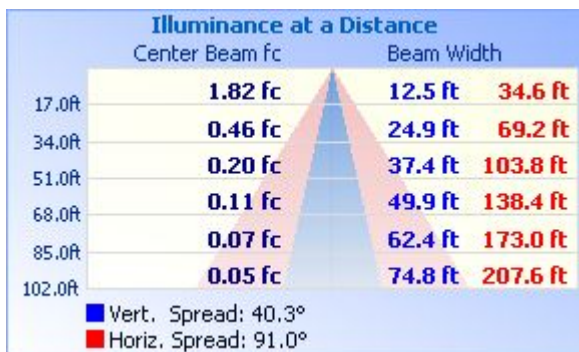
Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Luminaire
0-30	505.8	23.2%	23.2%
0-40	962.0	44.2%	44.2%
0-60	2,015.8	92.5%	92.5%
60-90	162.6	7.5%	7.5%
70-100	23.3	1.1%	1.1%
90-120	0.0	0%	0%
0-90	2,178.4	100%	100%
90-180	0.5	0%	0%
0-180	2,178.9	100%	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	51.2	2.3%	90-100	0	0%
10-20	161.0	7.4%	100-110	0	0%
20-30	293.6	13.5%	110-120	0.0	0%
30-40	456.2	20.9%	120-130	0.1	0%
40-50	574.0	26.3%	130-140	0.2	0%
50-60	479.8	22.0%	140-150	0.1	0%
60-70	139.3	6.4%	150-160	0.1	0%
70-80	19.9	0.9%	160-170	0.0	0%
80-90	3.4	0.2%	170-180	0.0	0%

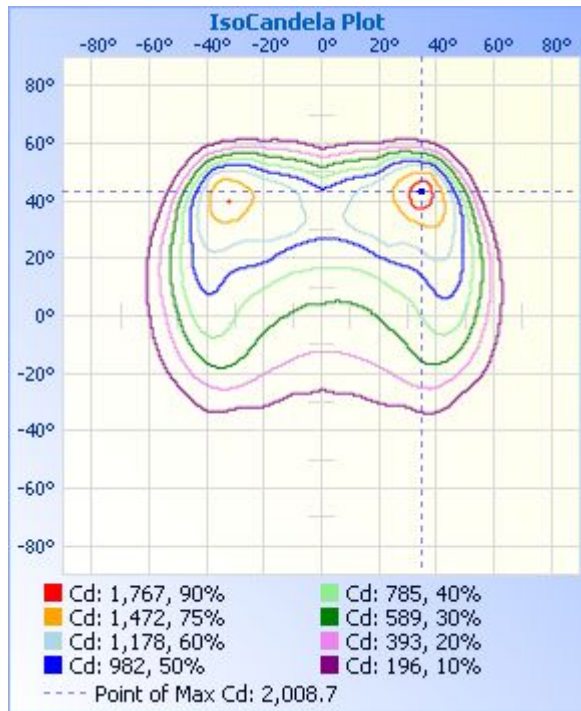
Photometric Data



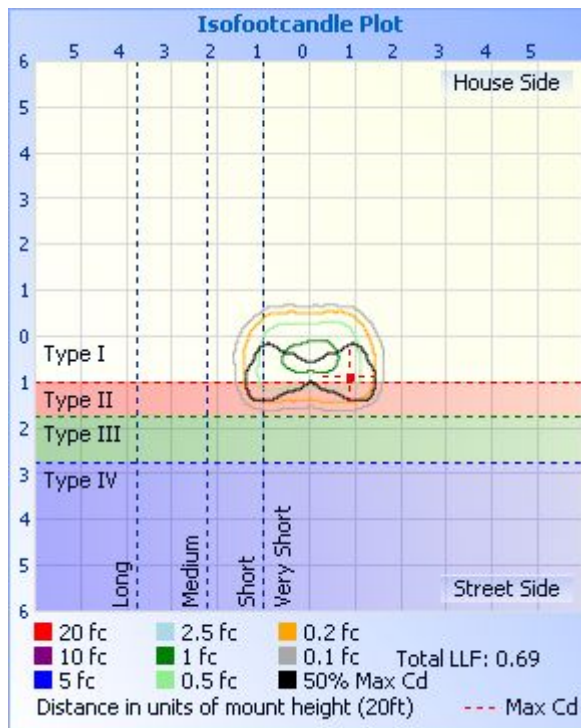
Illuminance Plots



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	526	526	526	526	526	526	526	526	526	526	526	526	526	526	526	526	526
1	538	540	536	531	529	523	518	517	515	514	516	521	525	529	533	537	538
2	551	554	546	537	533	519	510	508	505	502	505	515	526	534	540	549	551
3	565	569	556	543	538	517	503	499	495	492	495	510	527	538	547	562	565
4	578	585	566	550	543	516	495	490	485	481	486	505	527	542	553	575	578
5	592	599	577	558	548	516	488	481	475	472	478	501	525	548	560	589	592
6	607	614	587	567	552	517	482	472	465	463	472	498	526	554	569	601	607
7	622	627	596	576	557	519	478	463	456	454	466	495	528	560	578	614	622
8	638	638	606	584	561	520	474	454	445	445	460	493	530	564	588	627	638
9	654	649	615	594	566	522	471	444	432	437	454	492	531	569	600	640	654
10	668	661	624	603	570	524	467	434	419	427	449	490	533	575	610	653	668
11	682	674	636	614	574	527	464	422	404	416	445	489	536	582	621	666	682
12	697	690	648	625	580	530	461	410	389	404	440	489	536	591	632	679	697
13	714	706	662	636	585	534	458	399	374	392	435	492	542	600	643	694	714
14	732	725	677	648	590	536	454	386	359	380	430	496	548	610	655	712	732
15	750	744	697	660	598	538	449	372	345	368	424	499	545	620	670	732	750
16	768	762	717	674	608	540	445	359	331	355	419	503	555	631	685	750	768
17	786	781	738	688	615	542	440	347	318	343	413	505	572	643	702	767	786
18	804	798	758	702	622	543	435	335	305	331	408	507	580	657	720	783	804
19	822	817	779	717	631	546	430	324	291	319	401	511	589	672	738	801	822
20	840	834	801	733	642	550	423	312	277	308	395	516	598	688	759	819	840
21	857	849	823	750	654	554	417	300	262	296	389	520	606	705	779	836	857
22	875	865	847	766	666	557	411	287	247	283	382	523	617	722	800	853	875
23	894	885	873	783	679	562	404	273	232	270	376	525	627	736	823	871	894
24	912	909	900	797	695	567	395	260	217	257	369	526	638	752	849	891	912
25	929	938	926	811	708	571	387	246	202	244	361	526	647	770	878	912	929
26	949	967	957	821	719	579	380	233	187	230	352	528	656	789	910	935	949
27	970	997	995	832	728	587	373	218	173	217	343	529	667	808	945	960	970
28	993	1034	1034	843	744	596	364	204	160	203	334	533	682	826	977	991	993
29	1006	1091	1068	858	763	606	354	191	147	189	324	539	696	841	1006	1030	1006

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30	1018	1147	1097	875	784	612	344	178	134	175	314	544	711	853	1042	1077	1018
31	1033	1200	1124	892	806	618	334	164	123	162	305	547	724	865	1088	1121	1033
32	1048	1251	1143	907	824	623	324	151	114	148	296	550	743	878	1140	1169	1048
33	1058	1290	1151	927	840	627	313	138	107	135	287	554	760	897	1181	1214	1058
34	1065	1310	1161	951	858	629	300	126	102	123	275	560	779	918	1205	1247	1065
35	1065	1325	1172	974	877	631	286	117	99	113	262	565	798	941	1213	1268	1065
36	1062	1322	1183	996	891	628	272	108	98	105	248	568	821	969	1219	1278	1062
37	1059	1308	1200	1020	902	623	256	101	97	98	234	570	843	999	1227	1274	1059
38	1058	1299	1224	1051	909	612	239	96	96	94	220	569	861	1034	1242	1266	1058
39	1056	1299	1247	1075	908	598	222	92	96	90	205	566	879	1058	1263	1261	1056
40	1047	1302	1285	1092	904	582	202	90	95	87	190	558	891	1093	1291	1257	1047
41	1040	1307	1328	1105	897	565	184	88	94	85	174	547	899	1129	1327	1255	1040
42	1032	1313	1379	1116	882	540	166	86	93	84	158	533	903	1159	1369	1257	1032
43	1017	1316	1433	1120	859	514	148	85	92	82	143	517	900	1177	1416	1253	1017
44	990	1312	1492	1123	828	488	132	84	91	81	129	495	893	1192	1472	1252	990
45	957	1309	1553	1121	792	459	116	84	90	81	116	469	880	1201	1537	1252	957
46	914	1300	1610	1112	760	427	104	83	89	81	104	441	868	1206	1612	1244	914
47	866	1281	1660	1099	721	393	94	83	88	80	93	410	848	1211	1690	1223	866
48	814	1250	1711	1078	679	359	87	83	88	80	85	377	819	1209	1770	1190	814
49	757	1206	1757	1046	636	323	82	83	88	80	78	342	784	1197	1844	1147	757
50	700	1148	1786	1006	591	287	79	83	87	80	74	306	742	1172	1910	1094	700
51	646	1078	1798	958	543	251	78	82	87	80	72	270	702	1132	1964	1025	646
52	591	1007	1795	909	498	217	77	82	85	80	71	234	653	1088	1998	953	591
53	537	932	1778	861	455	185	78	83	83	80	70	201	599	1035	2009	879	537
54	481	858	1748	813	410	158	80	83	81	80	70	169	545	979	1995	802	481
55	425	781	1690	760	368	132	84	81	79	79	70	140	495	923	1959	729	425
56	364	708	1610	703	330	110	88	78	77	77	71	115	450	870	1899	661	364
57	302	642	1501	642	292	94	92	76	75	75	73	94	402	805	1812	594	302
58	235	581	1380	580	258	81	94	73	73	72	75	79	356	727	1689	525	235
59	167	519	1258	514	227	71	96	70	71	70	76	68	312	651	1532	457	167
60	111	448	1092	440	198	64	95	68	69	67	76	59	265	559	1347	384	111
61	73	373	941	368	173	58	94	66	67	65	74	53	224	469	1162	303	73

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62	46	294	799	312	151	55	91	64	65	63	70	49	189	386	987	224	46
63	24	218	660	255	132	51	86	62	63	61	65	45	160	293	811	156	24
64	18	149	526	188	116	48	79	60	59	59	59	42	135	191	640	87	18
65	15	67	408	119	101	46	71	58	55	57	54	40	113	105	487	35	15
66	13	28	306	66	85	43	63	56	48	55	49	38	94	70	354	24	13
67	11	21	215	43	75	41	56	54	42	53	45	37	78	55	235	19	11
68	9	17	148	34	64	39	51	52	40	50	42	35	65	46	144	15	9
69	7	13	96	30	53	38	46	49	39	48	39	34	53	39	86	12	7
70	5	10	62	27	44	36	42	46	38	45	36	33	43	34	53	8	5
71	3	7	37	25	37	34	38	43	37	41	33	31	36	29	26	5	3
72	1	4	20	23	32	32	35	39	36	38	30	29	32	26	16	3	1
73	1	2	13	22	28	30	32	36	36	35	27	28	28	23	11	1	1
74	0	1	10	20	26	29	28	33	36	33	23	26	25	20	7	0	0
75	0	0	6	18	24	27	24	30	35	30	20	24	23	18	4	0	0
76	0	0	4	16	22	25	20	27	34	27	17	22	21	15	2	0	0
77	0	0	2	14	20	23	18	25	33	24	15	20	19	12	0	0	0
78	0	0	0	13	18	21	16	22	32	21	13	18	17	10	0	0	0
79	0	0	0	10	16	19	14	19	30	18	8	16	16	8	0	0	0
80	0	0	0	8	14	17	12	17	28	16	10	14	14	5	0	0	0
81	0	0	0	6	13	14	11	15	25	14	8	11	12	3	0	0	0
82	0	0	0	4	11	11	9	12	24	12	7	9	10	1	0	0	0
83	0	0	0	2	8	9	8	10	22	9	6	7	7	0	0	0	0
84	0	0	0	0	6	7	6	8	18	6	5	4	5	0	0	0	0
85	0	0	0	0	3	4	5	5	2	2	3	2	2	0	0	0	0
86	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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94	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
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	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
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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104	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
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	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
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	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
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	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

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Report Format Number STD/QR4909-A/2

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

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126	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
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133	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
134	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
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144	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
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151	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

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158	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
159	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
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	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
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	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
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	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

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

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Test Voltage:277V

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150406 -G1	277.1	60	0.0887	22.34	0.9085	277.1

Goniophotometer Method:

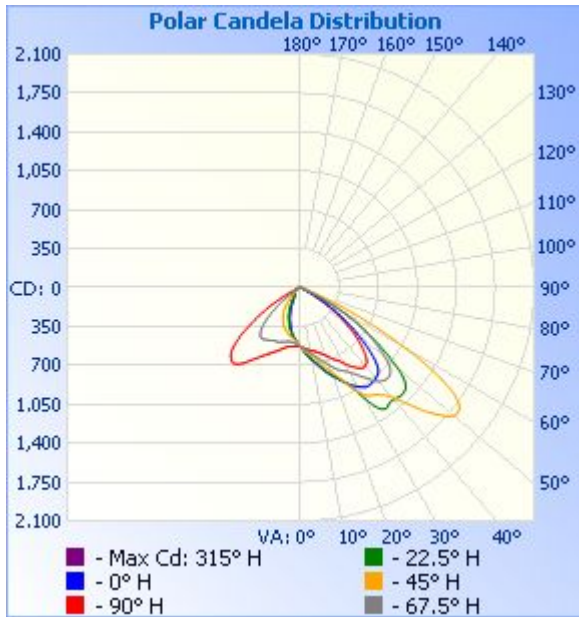
Parameter	Result
Test Voltage (V)	277.1
Frequency (Hz)	60
Total Luminous (lm)	2196.6
Luminous Efficacy (lm/W)	98.33
Beam Angle°	85.3
Center Beam Candle Power (cd)	2025
S/MH(C0/180)	1.77
S/MH(C90/270)	0.65

Zonal Lumen Tabulation

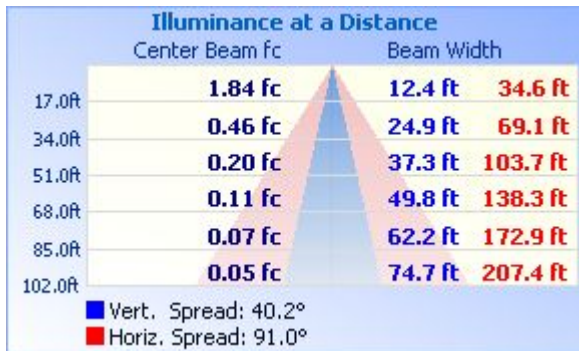
Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Luminaire
0-30	510.1	23.2%	23.2%
0-40	969.4	44.1%	44.1%
0-60	2,032.1	92.5%	92.5%
60-90	163.6	7.4%	7.4%
70-100	23.6	1.1%	1.1%
90-120	0.0	0%	0%
0-90	2,195.6	100%	100%
90-180	0.7	0%	0%
0-180	2,196.3	100%	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	51.7	2.4%	90-100	0	0%
10-20	162.6	7.4%	100-110	0	0%
20-30	295.8	13.5%	110-120	0.0	0%
30-40	459.3	20.9%	120-130	0.2	0%
40-50	578.9	26.4%	130-140	0.2	0%
50-60	483.7	22.0%	140-150	0.2	0%
60-70	140.0	6.4%	150-160	0.1	0%
70-80	20.1	0.9%	160-170	0.0	0%
80-90	3.5	0.2%	170-180	0.0	0%

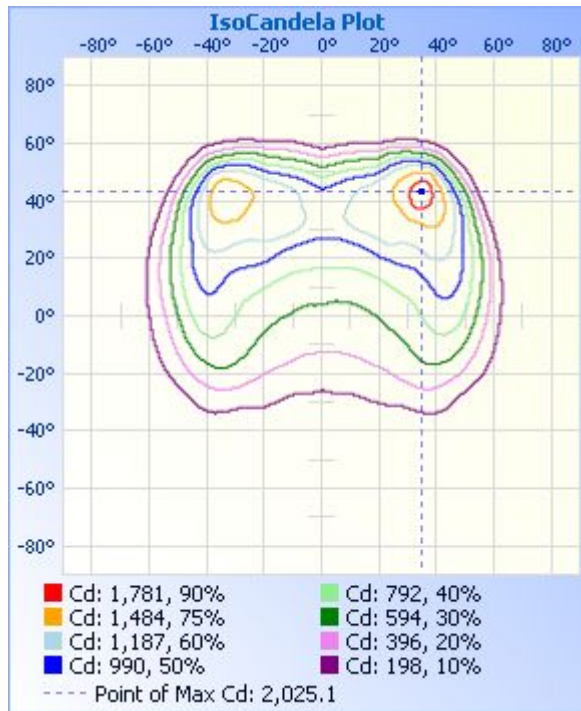
Photometric Data



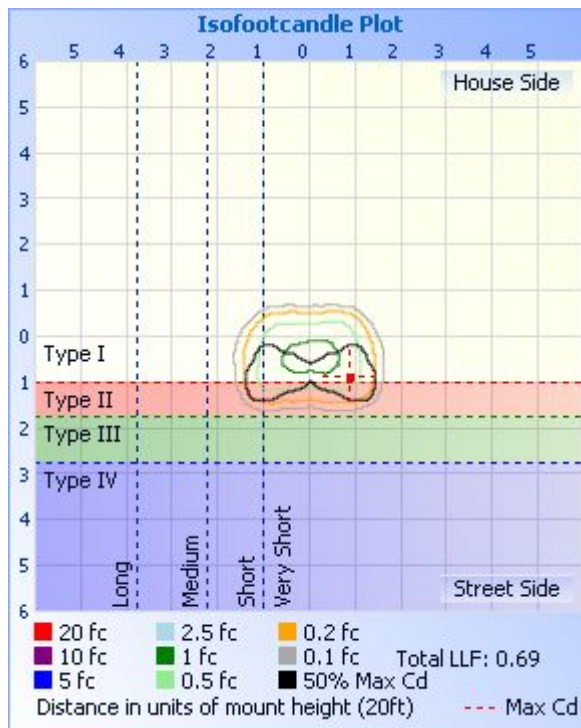
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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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

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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	531	531	531	531	531	531	531	531	531	531	531	531	531	531	531	531	531
1	543	545	541	536	534	528	524	521	520	519	521	526	530	535	538	542	543
2	556	560	551	542	538	524	516	513	510	507	510	520	531	539	545	554	556
3	570	575	561	548	543	522	508	504	500	497	500	514	532	543	552	567	570
4	584	590	571	556	548	521	500	495	490	486	490	510	531	548	558	581	584
5	597	605	582	564	553	521	493	486	480	477	482	506	530	554	566	594	597
6	613	619	592	573	558	522	487	477	470	468	476	503	531	560	574	607	613
7	628	632	602	582	562	523	483	468	461	459	470	500	533	565	584	620	628
8	644	644	611	590	566	524	479	459	449	450	464	498	535	570	594	632	644
9	660	655	620	600	571	527	476	449	437	441	458	496	536	575	605	645	660
10	674	667	629	609	575	529	472	438	424	431	454	495	538	581	616	658	674
11	689	680	641	620	580	532	469	427	410	421	449	494	541	588	627	671	689
12	703	696	654	631	585	535	466	416	395	408	443	494	543	596	637	684	703
13	720	713	668	642	589	538	463	404	380	397	439	496	546	605	648	700	720
14	739	731	684	654	595	541	458	391	364	385	434	500	553	616	661	718	739
15	757	750	703	666	603	543	454	377	350	373	429	503	561	626	676	737	757
16	775	768	723	681	612	545	450	364	336	360	423	507	569	636	691	756	775
17	793	787	745	694	620	547	445	351	323	348	418	509	577	648	708	773	793
18	810	805	764	708	627	548	441	340	310	336	412	511	586	662	726	789	810
19	829	823	785	723	635	551	435	328	296	324	405	515	594	677	744	806	829
20	846	839	807	740	646	554	429	316	281	312	399	520	603	693	764	825	846
21	864	854	829	756	658	558	422	304	267	300	393	524	612	710	784	842	864
22	882	871	853	774	670	562	416	291	252	287	386	527	623	726	805	859	882
23	900	891	879	789	683	567	409	277	236	274	380	530	632	741	828	876	900
24	918	916	905	804	699	572	401	264	221	261	373	530	643	758	854	896	918
25	935	944	931	817	713	576	392	250	206	248	366	530	652	775	882	917	935
26	955	972	962	828	723	583	385	236	190	234	356	532	660	794	913	939	955
27	977	1003	1000	839	732	592	378	222	176	221	347	534	672	814	949	964	977
28	999	1039	1040	850	748	601	369	208	163	207	338	537	687	832	980	994	999
29	1012	1096	1074	864	767	610	359	194	150	193	329	542	701	846	1010	1033	1012

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 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

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30	1024	1152	1103	882	787	617	349	181	137	179	319	548	716	859	1045	1079	1024
31	1040	1204	1130	898	809	622	339	168	125	165	309	551	730	870	1092	1124	1040
32	1056	1256	1149	915	828	628	329	154	116	151	300	554	748	884	1144	1171	1056
33	1067	1296	1156	935	844	631	318	140	108	138	291	558	766	902	1185	1217	1067
34	1073	1317	1166	958	861	634	305	128	103	126	280	564	785	924	1210	1250	1073
35	1074	1332	1177	982	880	636	291	118	100	115	266	569	804	947	1217	1271	1074
36	1071	1329	1189	1004	895	634	276	109	98	106	253	573	826	975	1223	1281	1071
37	1068	1316	1207	1028	906	629	261	102	97	100	239	574	850	1006	1234	1279	1068
38	1067	1308	1231	1059	914	619	244	97	96	95	225	574	867	1041	1249	1272	1067
39	1066	1308	1255	1082	914	605	226	93	96	91	209	571	884	1065	1271	1267	1066
40	1056	1311	1294	1100	911	590	207	90	95	88	194	564	898	1100	1300	1264	1056
41	1049	1316	1337	1113	904	573	188	88	94	85	178	553	906	1136	1335	1264	1049
42	1042	1323	1388	1123	890	548	170	86	93	84	162	540	909	1167	1379	1266	1042
43	1025	1326	1442	1128	868	522	152	85	92	82	147	524	906	1186	1425	1263	1025
44	999	1324	1501	1130	838	496	135	84	91	82	132	503	899	1200	1482	1262	999
45	966	1321	1564	1128	805	468	119	84	90	81	119	477	887	1208	1546	1262	966
46	922	1312	1620	1119	770	436	106	83	89	81	106	449	874	1214	1623	1255	922
47	873	1292	1671	1106	731	402	96	83	88	81	95	417	855	1219	1702	1234	873
48	820	1261	1722	1085	691	368	88	83	88	81	86	385	826	1217	1782	1201	820
49	762	1217	1768	1052	648	331	82	83	88	81	79	350	791	1204	1857	1157	762
50	705	1158	1796	1011	603	295	80	82	88	81	75	314	750	1180	1926	1104	705
51	650	1087	1808	964	555	258	78	82	87	80	73	277	708	1140	1979	1034	650
52	595	1015	1805	914	508	224	77	82	85	81	72	241	660	1095	2014	962	595
53	539	939	1789	867	465	191	78	83	83	80	71	207	605	1043	2025	884	539
54	483	865	1758	819	419	163	80	82	81	80	70	175	551	987	2012	808	483
55	426	787	1701	764	377	136	84	81	79	79	70	145	500	931	1974	733	426
56	364	712	1619	707	338	114	88	79	77	77	71	119	454	877	1916	664	364
57	302	646	1509	646	299	97	92	76	75	75	73	98	406	811	1830	597	302
58	234	584	1387	584	264	83	94	73	73	72	75	81	359	733	1705	527	234
59	164	521	1263	517	233	72	96	71	71	70	76	70	315	656	1542	457	164
60	109	450	1091	441	204	65	96	68	69	68	77	61	267	562	1357	383	109
61	72	373	945	370	177	59	94	66	67	66	74	54	226	472	1172	302	72

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>

62	44	293	800	313	155	55	92	64	66	64	71	49	190	389	994	224	44
63	23	217	662	255	135	52	87	62	63	61	66	45	161	293	819	154	23
64	18	148	528	188	118	49	80	60	60	59	60	42	136	191	646	85	18
65	15	63	410	117	103	46	72	58	55	57	54	40	113	104	490	35	15
66	13	28	305	65	90	44	64	56	49	55	50	38	94	70	357	24	13
67	11	21	215	42	77	42	57	54	42	53	46	37	79	55	236	19	11
68	9	17	147	34	65	40	51	52	41	51	42	36	65	46	145	15	9
69	7	13	96	30	55	38	46	49	39	48	39	34	53	39	86	11	7
70	5	10	62	27	45	36	42	45	38	46	36	33	43	34	52	8	5
71	3	7	37	25	38	34	38	43	37	42	34	31	37	29	26	5	3
72	1	4	20	24	32	33	35	39	36	38	31	30	32	26	16	3	1
73	1	2	13	22	29	31	32	36	36	35	28	28	28	23	11	1	1
74	0	1	10	20	26	29	28	33	36	33	24	26	25	20	7	0	0
75	0	0	6	18	24	27	24	31	35	30	20	24	23	18	4	0	0
76	0	0	4	17	22	25	21	28	34	28	17	22	21	15	1	0	0
77	0	0	2	14	20	23	18	25	33	24	15	20	19	12	0	0	0
78	0	0	1	12	18	21	16	22	32	21	13	18	18	10	0	0	0
79	0	0	0	10	17	19	14	19	30	18	12	16	16	8	0	0	0
80	0	0	0	8	15	17	12	17	28	16	10	14	14	5	0	0	0
81	0	0	0	6	13	14	11	15	26	14	8	12	12	3	0	0	0
82	0	0	0	4	11	11	10	13	24	12	7	9	10	1	0	0	0
83	0	0	0	2	8	9	8	10	22	9	6	7	7	0	0	0	0
84	0	0	0	0	6	7	6	8	19	7	5	5	4	0	0	0	0
85	0	0	0	0	3	5	5	5	3	3	3	2	1	0	0	0	0
86	0	0	0	0	1	2	3	1	0	1	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 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

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94	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
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	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
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	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
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	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
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	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
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
121	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
122	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
123	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
124	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
125	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0

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126	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
127	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
128	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
129	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
130	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
131	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0
132	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0
133	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0
134	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
135	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
136	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
137	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
138	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0
139	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0
140	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0
141	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0
142	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0
143	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0
144	0	0	0	0	0	1	0	1	1	1	0	3	0	0	0	0	0
145	0	0	0	0	0	3	0	1	1	1	0	1	0	0	0	0	0
146	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
151	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

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158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	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
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	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
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169	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
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	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
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	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

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Report Format Number STD/QR4909-A/2

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2.2 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-04-21	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	83505 (5000K)		

Electrical Measurement:

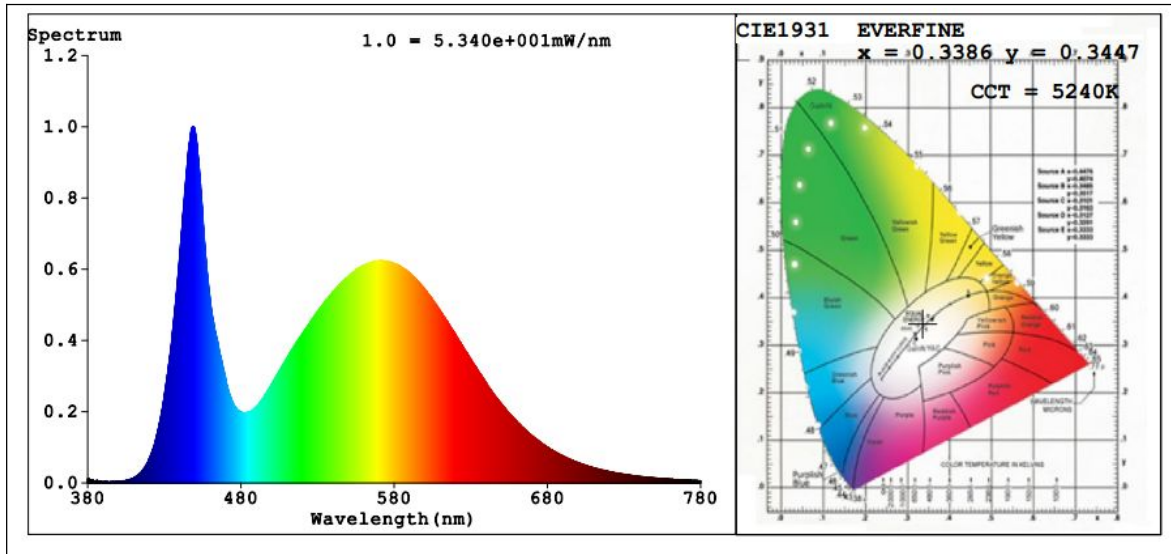
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150406	120.0	60	0.1884	22.32	0.9873	11.78
-G2	277.0	60	0.0884	22.18	0.9056	19.82

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	75.4
R9	0
CCT (K)	5240
Chromaticity (x, y)	x=0.3386 y=0.3447
Chromaticity (u', v')	u'=0.2097 v'=0.4803
Duv	-0.0008
Total Luminous (lm)	2274
Luminous Efficacy (lm/W)	101.88

Special Color Rendering Indices			
R1	73	R9	0
R2	81	R10	54
R3	86	R11	71
R4	75	R12	53
R5	74	R13	74
R6	73	R14	92
R7	82	R15	68
R8	59	--	--

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	2014-07-01	2015-06-30
ST-R-331	Spectral analysis system HAAS-2000	2014-07-01	2015-06-30
D204	Standard Lamp	2014-07-01	2015-06-30
PF2010	Power Meter for Integrating Sphere	2014-07-01	2015-06-30
EE-09	Goniophotometer system	2014-07-01	2015-06-30
D908S	Standard Lamp	2014-07-01	2015-06-30
PF210	Power Meter for Goniophotometer	2014-07-01	2015-06-30
ST-R-181A	Temperature Tester	2014-07-01	2015-06-30
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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