



Report No.: GZE160456-A

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

IGT LIGHTING INC.

3755 Lincoln St. Suite B, Riverside, CA 92503

High-Bay Luminaires for Commercial and Industrial buildings

Model name(s): IGTHB-0210050C

Representative (Tested) Model: IGTHB-0210050C

Test & Report By:

Jack Luo

Engineer: Jack Luo

Date: Apr.26,2016

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: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, 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	2016-04-26
Test Report No.	GZE160456-A
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	IGT LIGHTING INC.	
Brand Name	IGT LIGHTING	
Model Number	IGTHB-0210050C	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay luminaires for Commercial and Industrial buildings	
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	--	94.84	W
Input Current	--	0.7954	A
Input Voltage (ac)	--	120.1	V
Power Factor	--	0.9932	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	12980	lm
Initial Lumen Efficacy	--	136.87	lm/w
Correlated color temperature / CCT	4041	--	K
Color rendering index / CRI	74.7	--	
R9 Value	0	--	
Duv	-0.0028	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	--	4615	cd
Beam angle (if applicable)	--	112.9	°
Zonal lumens in the 0°-60° zone	--	81.6	%
Zonal lumens in the 60°-90° zone	--	18.2	%
Zonal lumens in the 90°-120° zone	--	0.1	%
Zonal lumens in the 120°-180° zone	--	0.1	%

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Product Information:

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Brand Name	IGT LIGHTING	
Model Number	IGTHB-0210050C	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay luminaires for Commercial and Industrial buildings	
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	96.55	--	W
Input Current	0.8079	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9959	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	13450	--	lm
Initial Lumen Efficacy	139.31	--	lm/w
Correlated color temperature / CCT	5157	--	K
Color rendering index / CRI	75.3	--	
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	: 2016-04-24
Date of Test	: 2016-04-25
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.

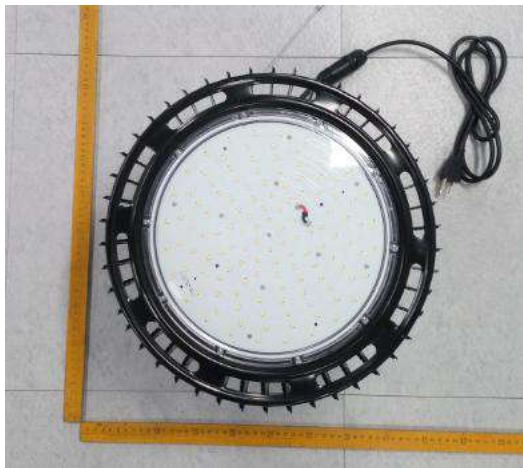
2. Photometric and Electrical Measurements – Integrating Sphere Method:

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:

Brand Name	IGT LIGHTING
Model Number	IGTHB-0210050C
Luminaire Type	High-Bay Luminaires for Commercial and Industrial buildings
Rated Voltage / Frequency	100~277Vac,50/ 60Hz
Nominal Power	100W
Rated Initial Lamp Lumen	N/A
Declared CCT	4000K,4500K,5000K
LED Manufacturer	Nichia Corporation
LED Model	NF2L757DR
Sample Receipt Date	Apr.24,2016
Sample Number	GZE160456-A1(4000K),A2(5000K)

Photo



2.1 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2016-03-30	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	IGTHB-0210050C		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160456	120.1	60	0.7954	94.84	0.9932	7.57
-A1	277.0	60	0.3532	92.67	0.9471	10.43

Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.1	R1	73	R9	0
Frequency (Hz)	60	R2	82	R10	53
Color Rendering Index (CRI)	74.7	R3	86	R11	67
R9	0	R4	73	R12	42
CCT (K)	4041	R5	72	R13	75
Chromaticity (x, y)	x=0.3767 y=0.3686	R6	72	R14	92
Chromaticity (u', v')	u'=0.2259 v'=0.4974	R7	83	R15	69
Duv	-0.0028	R8	58	--	--

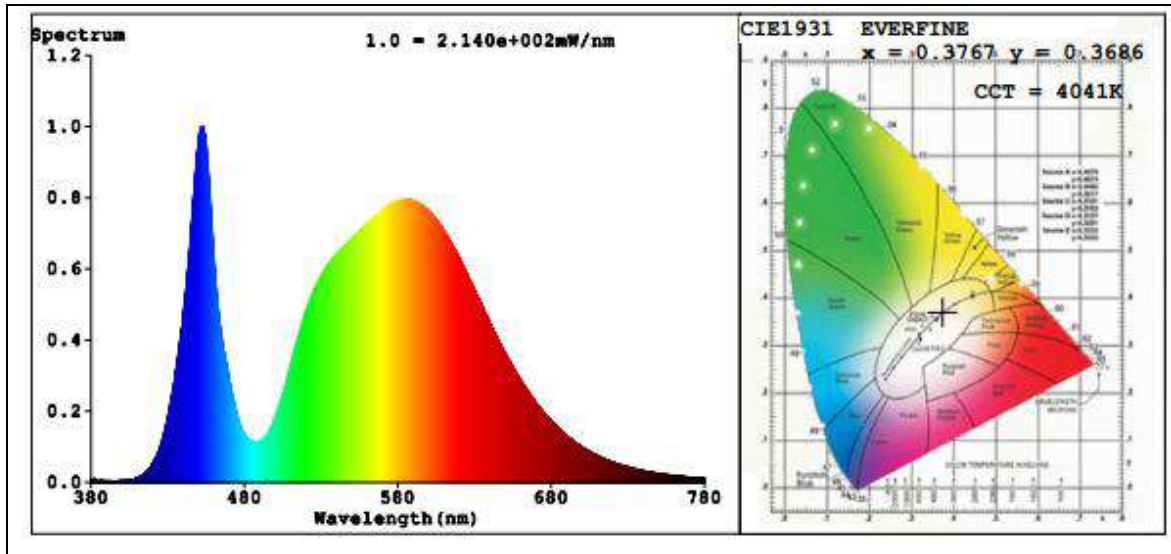
Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.1
Frequency (Hz)	60
Total Luminous (lm)	12980
Luminous Efficacy (lm/W)	136.87
Beam Angle °	112.9
Center Beam Candle Power (cd)	4615

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	12910
Luminous Efficacy (lm/W)	139.30

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation:

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,622.4	27.9%
0-40	5,968.7	46%
0-60	10,595.1	81.6%
60-90	2,356.8	18.2%
70-100	806.9	6.2%
90-120	7.0	0.1%
0-90	12,951.8	99.8%
90-180	26.6	0.2%
0-180	12,978.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	436.6	3.4%	90-100	1.2	0%
10-20	1,258.9	9.7%	100-110	2.2	0%
20-30	1,926.9	14.8%	110-120	3.6	0%
30-40	2,346.3	18.1%	120-130	4.6	0%
40-50	2,447.6	18.9%	130-140	4.6	0%
50-60	2,178.8	16.8%	140-150	4.1	0%
60-70	1,551.1	12.0%	150-160	3.3	0%
70-80	712.2	5.5%	160-170	2.1	0%
80-90	93.4	0.7%	170-180	0.8	0%

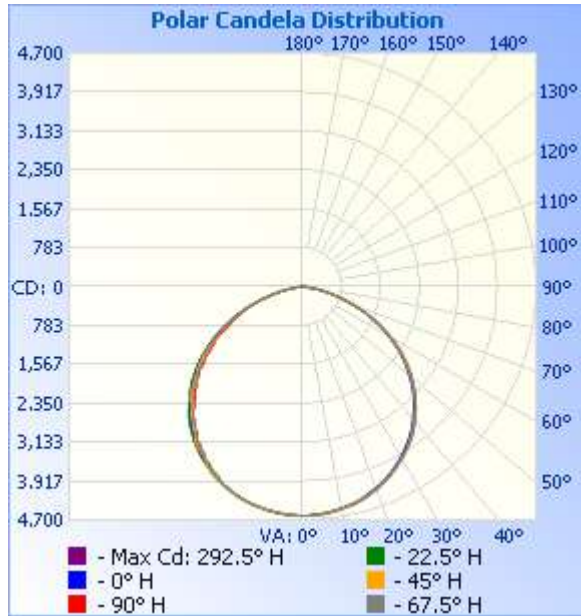
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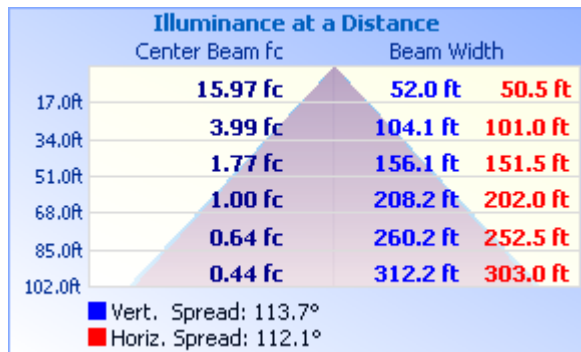
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Photometric Data



Illuminance Plots



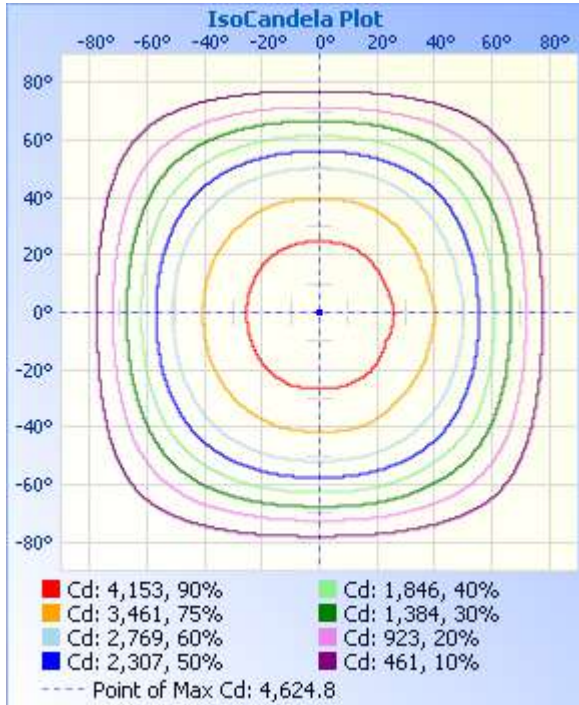
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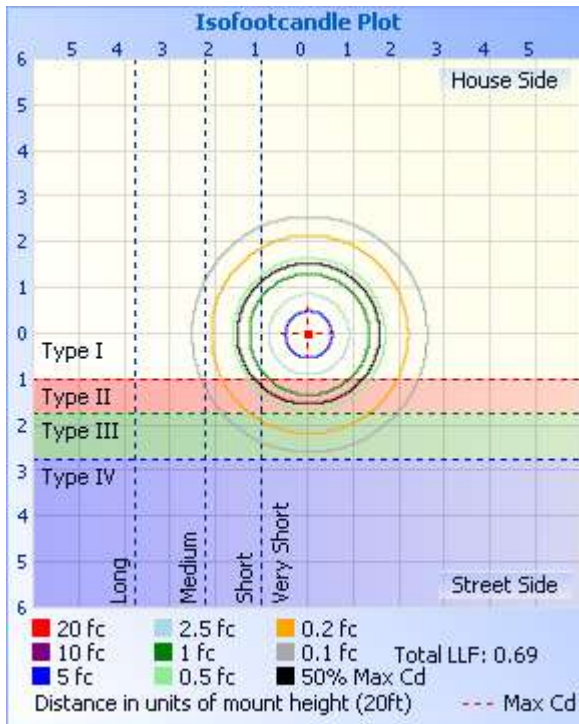
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ISOCANDELA DIAGRAM



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	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615	4615
1	4611	4612	4613	4613	4612	4616	4610	4617	4619	4611	4618	4608	4612	4625	4611	4613	4611
2	4607	4612	4612	4611	4611	4600	4608	4615	4610	4605	4612	4607	4611	4612	4603	4608	4607
3	4600	4607	4612	4604	4610	4606	4605	4611	4604	4601	4609	4605	4604	4604	4593	4604	4600
4	4598	4604	4606	4599	4602	4606	4591	4607	4605	4592	4602	4602	4592	4596	4595	4598	4598
5	4585	4597	4602	4590	4597	4598	4595	4604	4596	4585	4591	4595	4589	4581	4585	4590	4585
6	4580	4588	4588	4581	4590	4592	4582	4599	4587	4577	4577	4586	4577	4574	4579	4579	4580
7	4566	4577	4578	4570	4580	4578	4572	4592	4575	4571	4569	4571	4575	4561	4567	4570	4566
8	4556	4568	4566	4561	4567	4554	4559	4582	4566	4556	4561	4563	4566	4549	4551	4558	4556
9	4542	4554	4557	4551	4558	4554	4556	4569	4553	4546	4553	4552	4555	4538	4542	4543	4542
10	4528	4537	4536	4539	4544	4534	4544	4556	4543	4532	4545	4537	4540	4524	4525	4527	4528
11	4514	4522	4528	4523	4529	4525	4534	4540	4530	4522	4532	4524	4525	4505	4511	4514	4514
12	4498	4510	4511	4516	4512	4510	4519	4521	4512	4508	4518	4512	4511	4491	4499	4496	4498
13	4478	4495	4489	4503	4505	4495	4511	4505	4502	4495	4500	4495	4491	4476	4478	4476	4478
14	4465	4476	4471	4490	4491	4482	4493	4487	4478	4481	4488	4480	4480	4461	4457	4462	4465
15	4439	4460	4453	4469	4469	4460	4477	4474	4462	4462	4469	4463	4459	4442	4436	4446	4439
16	4417	4439	4434	4449	4445	4438	4461	4459	4440	4445	4447	4447	4438	4424	4412	4427	4417
17	4391	4413	4413	4427	4421	4416	4442	4445	4410	4423	4422	4430	4414	4402	4388	4406	4391
18	4363	4388	4389	4396	4398	4395	4417	4420	4390	4400	4396	4407	4391	4378	4363	4383	4363
19	4338	4363	4366	4368	4374	4373	4392	4394	4367	4377	4368	4382	4361	4353	4340	4359	4338
20	4310	4339	4333	4338	4342	4346	4372	4372	4338	4352	4343	4354	4335	4326	4313	4336	4310
21	4285	4310	4302	4308	4311	4316	4342	4346	4308	4329	4317	4328	4310	4295	4285	4307	4285
22	4254	4280	4268	4278	4282	4285	4309	4317	4286	4300	4284	4299	4282	4262	4251	4281	4254
23	4224	4251	4242	4246	4248	4259	4278	4285	4254	4272	4257	4243	4251	4234	4215	4248	4224
24	4189	4221	4213	4217	4217	4221	4249	4251	4220	4244	4226	4168	4219	4183	4182	4212	4189
25	4154	4187	4181	4186	4180	4185	4207	4221	4187	4214	4199	4136	4183	4126	4152	4170	4154
26	4121	4145	4150	4152	4147	4154	4174	4184	4152	4179	4162	4120	4142	4071	4116	4134	4121
27	4083	4107	4117	4117	4108	4120	4135	4151	4119	4135	4126	4071	4101	4052	4074	4097	4083
28	4043	4070	4075	4074	4075	4080	4099	4113	4083	4095	4083	4015	4038	4036	4034	4052	4043

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29	4002	4027	4039	4034	4038	4039	4057	4072	4050	4052	4024	4010	4012	3942	3993	4013	4002
30	3961	3988	4001	3993	4001	3997	4018	4029	4014	4012	3969	3969	3949	3872	3953	3968	3961
31	3916	3947	3953	3951	3960	3960	3976	3987	3975	3968	3912	3905	3870	3877	3905	3928	3916
32	3872	3906	3914	3907	3916	3918	3932	3945	3932	3922	3886	3859	3861	3832	3867	3881	3872
33	3824	3865	3867	3868	3881	3875	3892	3898	3891	3884	3873	3778	3829	3741	3823	3839	3824
34	3778	3817	3821	3825	3838	3830	3849	3855	3850	3838	3833	3771	3780	3688	3757	3789	3778
35	3735	3775	3769	3778	3785	3784	3804	3809	3801	3792	3771	3700	3714	3659	3677	3741	3735
36	3683	3726	3721	3734	3740	3732	3751	3755	3743	3746	3681	3649	3615	3593	3625	3687	3683
37	3631	3667	3668	3685	3689	3683	3694	3706	3688	3696	3599	3650	3590	3549	3570	3636	3631
38	3579	3615	3609	3627	3632	3635	3642	3653	3632	3649	3550	3529	3528	3450	3525	3580	3579
39	3521	3562	3550	3571	3575	3583	3590	3597	3573	3602	3492	3474	3448	3452	3500	3527	3521
40	3462	3508	3499	3515	3518	3525	3531	3544	3519	3549	3445	3415	3454	3400	3438	3473	3462
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44	3220	3258	3262	3275	3279	3280	3293	3312	3287	3294	3240	3185	3111	3155	3180	3236	3220
45	3158	3192	3200	3212	3213	3217	3231	3250	3222	3229	3201	3105	3081	3018	3103	3169	3158
46	3098	3132	3135	3143	3148	3154	3169	3187	3157	3165	3139	3096	3007	2951	3030	3100	3098
47	3031	3069	3068	3079	3083	3086	3098	3119	3086	3097	3060	3006	2911	2919	2943	3035	3031
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49	2885	2920	2927	2944	2946	2947	2966	2977	2950	2959	2870	2813	2789	2740	2798	2883	2885
50	2814	2848	2853	2874	2875	2877	2894	2899	2875	2888	2791	2761	2728	2695	2740	2808	2814
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52	2666	2691	2702	2722	2731	2729	2749	2749	2725	2727	2670	2608	2545	2562	2605	2655	2666
53	2593	2615	2627	2643	2657	2655	2672	2669	2648	2656	2598	2536	2473	2448	2543	2579	2593
54	2515	2537	2549	2563	2577	2578	2585	2589	2570	2577	2523	2424	2422	2405	2483	2504	2515
55	2434	2459	2468	2482	2496	2501	2503	2508	2490	2491	2448	2397	2286	2339	2398	2426	2434
56	2352	2378	2386	2401	2415	2419	2423	2421	2410	2403	2371	2292	2234	2240	2304	2346	2352
57	2267	2292	2306	2319	2337	2335	2344	2338	2321	2316	2289	2233	2128	2140	2212	2265	2267
58	2188	2207	2222	2230	2251	2249	2261	2253	2234	2229	2192	2160	2106	2058	2122	2183	2188
59	2100	2118	2133	2143	2165	2156	2176	2168	2148	2143	2096	2069	2018	1972	2036	2096	2100

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60	2012	2034	2045	2055	2075	2069	2089	2077	2058	2059	2006	1991	1895	1899	1950	2011	2012
61	1923	1947	1958	1970	1983	1982	1999	1988	1965	1972	1904	1889	1763	1828	1862	1921	1923
62	1833	1852	1866	1882	1895	1897	1904	1892	1872	1880	1798	1820	1696	1765	1781	1830	1833
63	1743	1764	1777	1790	1800	1807	1814	1798	1779	1786	1705	1728	1629	1679	1693	1741	1743
64	1654	1676	1688	1700	1709	1714	1724	1703	1686	1693	1619	1629	1563	1591	1604	1653	1654
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66	1473	1499	1510	1521	1519	1522	1530	1516	1502	1506	1438	1450	1367	1407	1428	1471	1473
67	1380	1408	1412	1425	1429	1429	1436	1423	1410	1415	1353	1350	1330	1315	1336	1380	1380
68	1288	1314	1316	1329	1335	1334	1337	1329	1315	1321	1267	1243	1250	1229	1246	1286	1288
69	1198	1221	1219	1237	1242	1234	1240	1231	1219	1223	1181	1168	1152	1132	1160	1189	1198
70	1107	1125	1126	1143	1143	1138	1139	1139	1128	1136	1091	1088	1052	1042	1075	1093	1107
71	1014	1032	1036	1047	1049	1042	1047	1041	1035	1042	996	1006	975	959	987	1000	1014
72	923	943	943	955	953	946	951	946	939	942	901	916	889	879	896	913	923
73	825	852	851	861	862	848	862	853	848	846	809	820	796	801	805	827	825
74	740	763	763	768	773	762	769	768	760	758	723	731	710	710	723	742	740
75	661	678	679	683	690	679	684	685	669	674	637	636	635	615	638	658	661
76	577	597	596	605	610	608	601	602	592	590	557	555	552	529	555	578	577
77	499	517	517	520	526	532	520	517	508	506	488	480	473	455	471	496	499
78	420	441	446	442	454	450	452	445	431	426	410	412	404	374	397	416	420
79	354	368	375	381	389	380	378	388	366	357	344	345	341	314	337	347	354
80	290	304	316	314	318	318	312	303	292	296	270	284	280	259	271	278	290
81	217	241	241	242	253	257	257	237	230	233	224	215	218	216	214	217	217
82	165	176	188	194	204	192	190	183	167	170	164	164	157	157	154	161	165
83	114	126	140	143	151	142	134	129	120	120	113	116	112	111	114	114	114
84	74	83	97	105	102	101	96	80	75	74	75	77	75	75	75	74	74
85	40	47	59	66	65	66	59	46	41	43	45	48	48	48	46	40	40
86	18	23	32	39	41	42	32	23	18	20	24	28	28	29	24	19	18
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88	3	3	5	7	6	6	4	2	2	2	5	7	6	6	5	2	3
89	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	1	2
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91	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1
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93	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1
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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	2016-04-25	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	XSY-HBPF100W-50K-120		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160456	120.0	60	0.8079	96.55	0.9959	7.81
-A2	277.0	60	0.3636	94.72	0.9404	10.63

Sphere-Spectroradiometer Method:

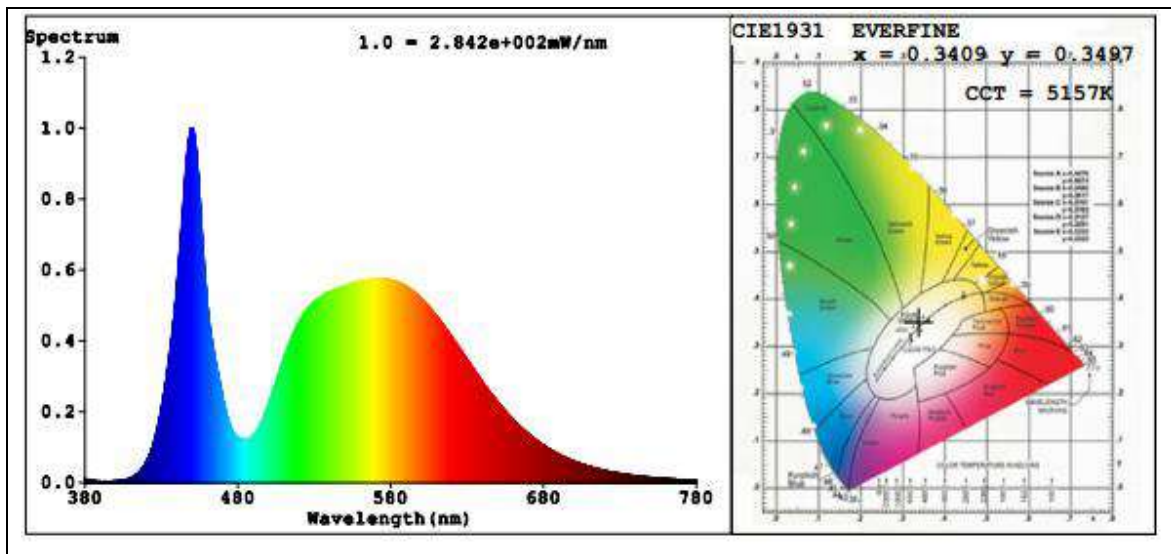
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	75.3
R9	0
CCT (K)	5157
Chromaticity (x, y)	x=0.3409 y=0.3497
Chromaticity (u', v')	u'=0.2093 v'=-0.4831
Duv	0.0008
Total Initial Lumen Output(lm)	13450
Initial Lumen Efficacy(lm/w)	139.31

Special Color Rendering Indices			
R1	74	R9	0
R2	80	R10	50
R3	83	R11	74
R4	76	R12	47
R5	74	R13	74
R6	72	R14	90
R7	83	R15	69
R8	62	--	--

Sphere-Spectroradiometer Method (277V):

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Initial Lumen Output(lm)	13475
Initial Lumen Efficacy(lm/w)	142.26

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 *******