



LM-79-08 Test Report

For

IGT LIGHTING INC.

(Brand Name: IGT)

3755 Lincoln St. Suite B, Riverside, CA 92503

Four-Foot Linear Replacement Lamps

Model name(s): IGTTU-1501850F-4BC (5000K)

Representative (Tested) Model: IGTTU-1501850F-4BC (5000K)

Representative Tested Model	Represented Models	Relations
IGTTU-1501850F-4BC (5000K)	IGTTU-1501850F-4BC (5000K)	

Test & Report By:

Dendi Lin

Engineer: Dendi Lin

Date: July.21,2015

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-B/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.21,2015
Test Report No.	GZE150726-C
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	IGT LIGHTING INC.	
Brand Name	IGT	
Model Number	IGTTU-1501850F-4BC (5000K)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Four-Foot Linear Replacement Lamps	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	1200	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	

Integrating Sphere
Goniophotometer
Electrical Measurements:
Output
Output

Input Wattage	18.43	--	W
Input Current	0.1638	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9379	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	2318	--	lm
Initial Lumen Efficacy	125.71	--	lm/w
Correlated color temperature / CCT	2952	--	K
Color rendering index / CRI	82.1	--	
R9 Value	7	--	
Duv	-0.0029	--	
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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Product Information:

Organization Name	IGT LIGHTING INC.	
Brand Name	IGT	
Model Number	IGTTU-1501850F-4BC (5000K)	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Four-Foot Linear Replacement Lamps	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	1200	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	

Electrical Measurements:	Integrating Sphere	Goniophotometer	
	Output	Output	
Input Wattage	18.59	--	W
Input Current	0.1666	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9297	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	2358.45	--	lm
Initial Lumen Efficacy	126.8	--	lm/w
Correlated color temperature / CCT	5117	--	K
Color rendering index / CRI	82.7	--	
R9 Value	11	--	
Duv	0.0009	--	
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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Date of Receipt	: July.15,2015
Date of Test	: July.18,2015
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.

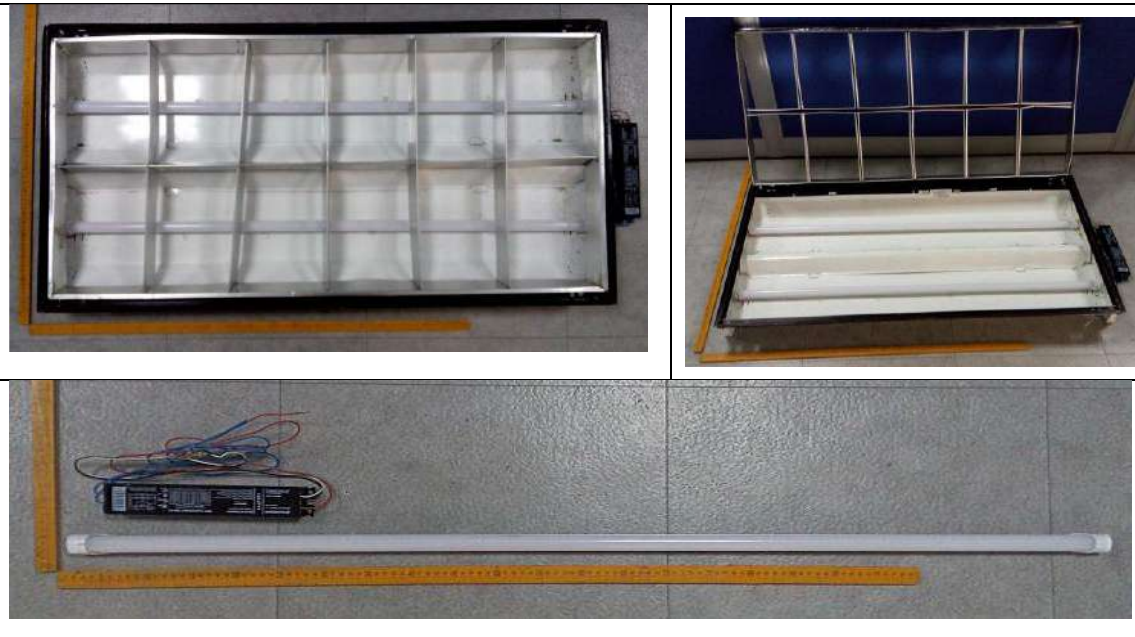
2. Photometric and Electrical Measurements – Integrating Sphere Method:

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:

Brand Name	IGT
Model Number	IGTTU-1501850F-4BC (5000K)
Luminaire Type	Four-Foot Linear Replacement Lamps
Rated Voltage / Frequency	100 ~ 277 Vac, 50/60Hz
Nominal Power	18W
Rated Initial Lamp Lumen	--
Declared	5000K
LED Manufacturer	IGT LIGHTING INC.
LED Model	IGTTU-1501850F-4BC (5000K)
Test Ballast	OSRAM QTP 2x32T8/UNV ISN-SC
Sample Receipt Date	July.15,2015
Sample Number	GZE150726-C1, (5000K)

Photo



2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-07-18	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time(min)	90
Model Number	IGTTU-1501850F-4BC (5000K)		

Electrical Measurement for Bare Lamp :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150726	120.0	60	0.1638	18.43	0.9379	15.79
-C1	277.0	60	0.0745	18.81	0.9114	17.93

Sphere-Spectroradiometer Method for Bare Lamp:

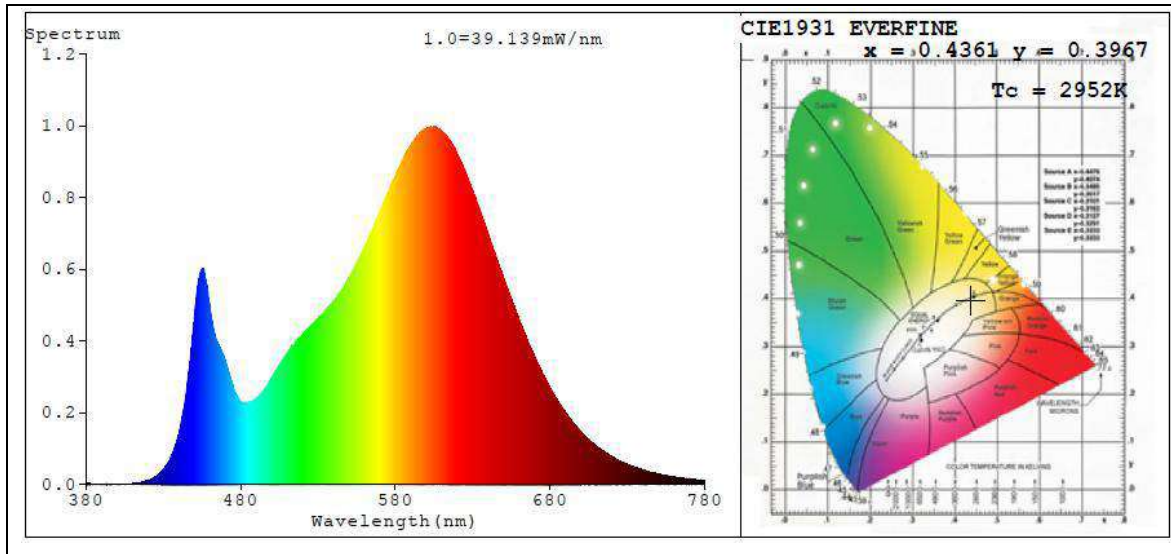
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	82.1
R9	7
CCT (K)	2952
Chromaticity (x, y)	x=0.4361 y=0.3967
Chromaticity (u', v')	u'=0.2533 v'=0.5183
Duv	-0.0029
Total Initial Lumen Output(lm)	2318
Initial Lumen Efficacy(lm/w)	125.71

Special Color Rendering Indices			
R1	82	R9	7
R2	94	R10	85
R3	93	R11	77
R4	78	R12	73
R5	82	R13	85
R6	92	R14	97
R7	80	R15	74
R8	57	--	--

Sphere-Spectroradiometer Method for Bare Lamp:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Initial Lumen Output(lm)	2358.45
Initial Lumen Efficacy(lm/w)	126.8

Spectral Power Distribution & Chromaticity Diagram



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2.2 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
--	-----------------------

Test date	2015-07-18	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time(min)	90
Model Number	IGTTU-1501850F-4BC (5000K)		

Electrical Measurement for 2-lamp in Luminaire Lithonia 2PM3N 12 cell 2x4 parabolic:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150726	120.0	60	0.3211	35.85	0.9305	15.23
-C1, C2	277.0	60	0.1452	36.61	0.9104	18.54

Color Data for 2-lamp in Luminaire Lithonia 2PM3N 12 cell 2x4 parabolic:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	8
Frequency (Hz)	60	R2	94	R10	86
Color Rendering Index (CRI)	82.3	R3	93	R11	77
R9	8	R4	78	R12	74
CCT (K)	2955	R5	82	R13	75
Chromaticity (x, y)	x=0.4357 y=0.3962	R6	92	R14	97
Chromaticity (u', v')	u'=0.2532 v'=0.5181	R7	80	R15	75
Duv	-0.0030	R8	57	--	--

Goniophotometer Method for 2-lamp in Luminaire Lithonia 2PM3N 12 cell 2x4 parabolic:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	4481
Luminous Efficacy (lm/W)	125.12
Beam Angle°	112.6
Center Beam Candle Power (cd)	1109
S/MH(C0/180)	1.40
S/MH(C90/270)	1.22
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	4612
Luminous Efficacy (lm/W)	126.21

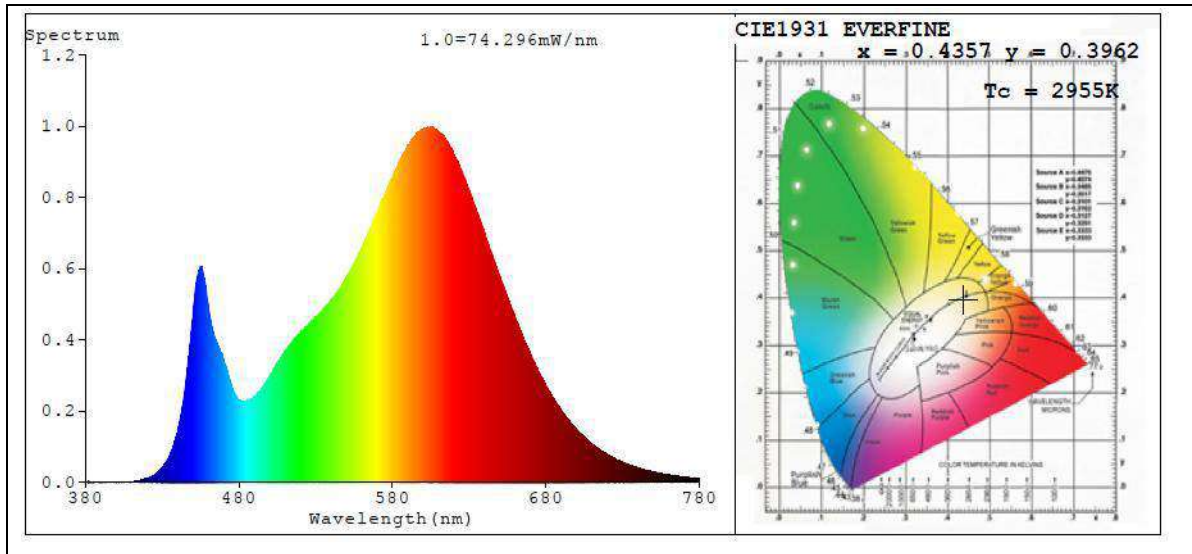
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Spectral Power Distribution & Chromaticity Diagram



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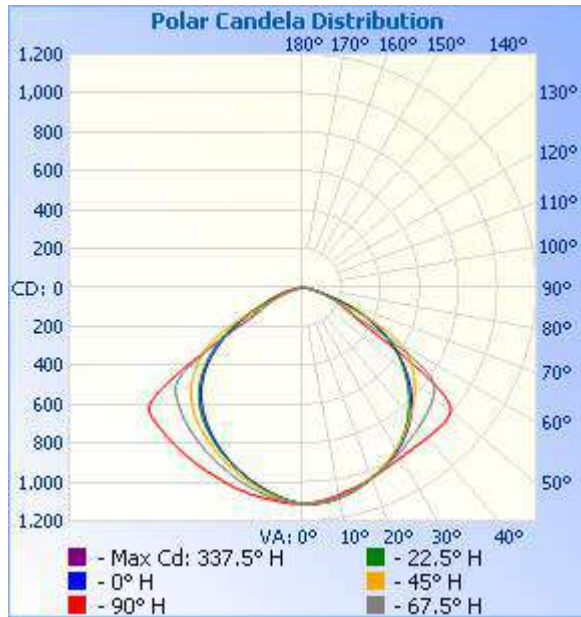
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Zonal Lumen Tabulation

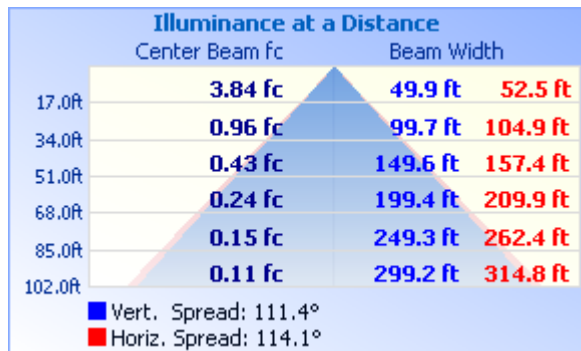
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	865.0	28%
0-40	1,449.8	46.9%
0-60	2,702.2	87.4%
60-90	387.6	12.5%
70-100	100.2	3.2%
90-120	0.1	0%
0-90	3,089.8	100%
90-180	0.3	0%
0-180	3,090.1	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	104.6	3.4%	90-100	0.0	0%
10-20	299.0	9.7%	100-110	0.0	0%
20-30	461.4	14.9%	110-120	0.1	0%
30-40	584.8	18.9%	120-130	0.0	0%
40-50	658.4	21.3%	130-140	0.0	0%
50-60	594.0	19.2%	140-150	0.1	0%
60-70	287.4	9.3%	150-160	0.1	0%
70-80	87.5	2.8%	160-170	0.1	0%
80-90	12.7	0.4%	170-180	0.0	0%

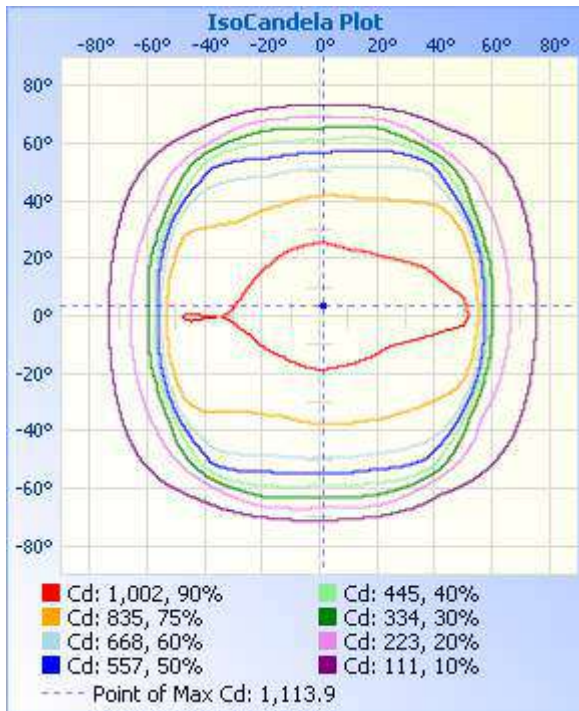
Photo metric Data



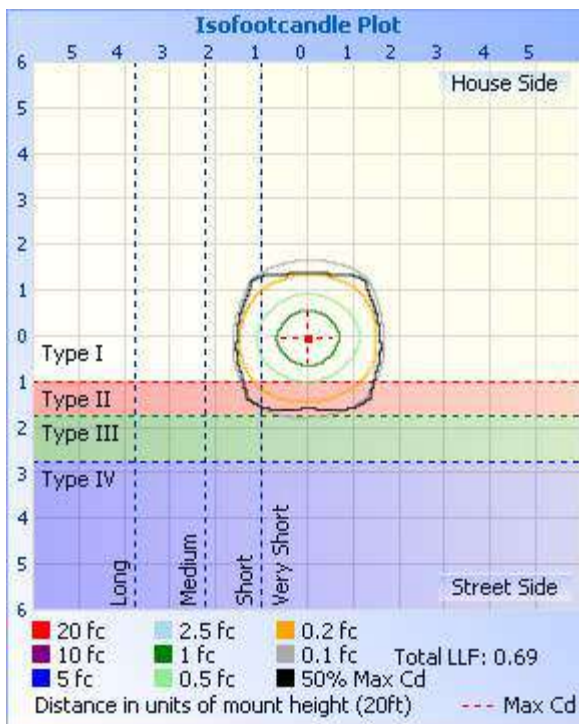
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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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	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109	1109
1	1111	1111	1111	1110	1110	1107	1108	1107	1107	1107	1107	1108	1111	1110	1111	1111	1111
2	1112	1112	1111	1110	1108	1105	1104	1103	1104	1104	1105	1106	1112	1113	1112	1113	1112
3	1113	1112	1111	1110	1105	1103	1100	1099	1099	1100	1102	1105	1112	1113	1113	1114	1113
4	1112	1112	1110	1109	1103	1099	1096	1096	1094	1096	1099	1101	1110	1113	1112	1114	1112
5	1111	1112	1109	1107	1100	1097	1093	1091	1089	1090	1094	1099	1109	1110	1113	1112	1111
6	1109	1110	1107	1105	1097	1093	1088	1086	1083	1085	1090	1095	1106	1108	1109	1111	1109
7	1107	1109	1105	1103	1093	1088	1083	1080	1077	1078	1085	1094	1105	1107	1109	1109	1107
8	1103	1106	1102	1099	1090	1083	1077	1074	1072	1072	1080	1091	1103	1105	1106	1105	1103
9	1100	1103	1099	1095	1085	1078	1072	1067	1066	1066	1075	1087	1101	1105	1103	1102	1100
10	1095	1099	1094	1092	1081	1073	1065	1061	1060	1060	1069	1084	1101	1104	1100	1098	1095
11	1091	1095	1090	1086	1076	1068	1058	1054	1052	1052	1064	1079	1099	1102	1098	1092	1091
12	1086	1090	1085	1082	1071	1062	1052	1047	1046	1045	1058	1073	1098	1100	1093	1087	1086
13	1081	1085	1079	1077	1068	1056	1045	1040	1039	1039	1052	1069	1096	1097	1090	1082	1081
14	1076	1080	1073	1072	1064	1051	1037	1033	1032	1033	1046	1064	1095	1095	1086	1077	1076
15	1070	1074	1067	1068	1061	1046	1030	1025	1026	1026	1039	1060	1094	1094	1082	1071	1070
16	1065	1069	1062	1063	1056	1042	1023	1017	1018	1018	1032	1055	1091	1091	1077	1065	1065
17	1059	1061	1055	1059	1053	1036	1015	1010	1010	1011	1026	1049	1089	1089	1072	1058	1059
18	1053	1056	1049	1055	1048	1030	1008	1001	1004	1004	1020	1044	1088	1087	1068	1053	1053
19	1047	1050	1043	1049	1044	1025	1002	994	996	996	1013	1039	1086	1084	1062	1046	1047
20	1040	1043	1036	1043	1040	1020	994	985	988	990	1007	1034	1083	1080	1057	1039	1040
21	1034	1036	1030	1037	1036	1015	988	977	980	983	1000	1028	1078	1075	1052	1032	1034
22	1029	1029	1024	1033	1033	1009	982	969	972	975	993	1021	1076	1072	1046	1026	1029
23	1021	1021	1017	1026	1029	1004	974	960	964	968	986	1016	1073	1068	1041	1019	1021
24	1015	1014	1010	1020	1024	998	967	951	956	960	979	1011	1071	1064	1034	1012	1015
25	1008	1006	1003	1013	1022	994	959	942	947	953	972	1006	1069	1059	1028	1004	1008
26	1000	998	995	1007	1018	987	952	932	939	944	965	1000	1066	1055	1022	996	1000
27	993	990	987	1001	1016	983	944	924	930	936	958	995	1065	1051	1015	988	993
28	987	980	979	996	1014	980	938	914	922	929	951	990	1064	1048	1008	979	987
29	978	972	970	990	1011	975	930	905	913	920	943	984	1060	1046	1002	972	978

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30	970	962	961	985	1009	971	923	897	904	912	936	979	1060	1040	995	964	970
31	961	953	953	979	1009	967	914	887	895	903	928	974	1057	1037	988	955	961
32	952	942	944	973	1005	964	908	877	885	895	921	967	1055	1033	982	948	952
33	943	932	934	968	1005	960	900	869	875	886	915	963	1054	1028	974	939	943
34	933	922	925	963	1005	956	893	860	865	877	908	957	1052	1025	968	931	933
35	923	911	914	957	1001	954	885	850	856	869	900	952	1050	1021	962	922	923
36	913	899	904	952	1002	951	879	840	845	859	893	947	1048	1017	955	913	913
37	901	887	894	947	1003	947	872	831	835	849	885	940	1046	1011	947	904	901
38	890	874	885	942	1003	944	864	820	825	840	877	935	1043	1008	940	893	890
39	878	862	874	937	1003	941	857	810	814	829	869	929	1041	1004	934	883	878
40	866	847	863	932	1004	938	849	800	802	818	860	924	1039	1000	925	872	866
41	851	833	853	927	1005	935	843	789	790	807	851	917	1038	994	918	862	851
42	837	819	843	923	1005	933	834	777	778	794	842	911	1036	990	909	850	837
43	824	804	832	917	1006	931	827	766	765	782	831	904	1034	985	901	838	824
44	808	789	821	912	1007	927	819	754	752	767	820	896	1031	980	892	826	808
45	793	773	810	908	1008	923	811	743	737	753	809	889	1030	974	885	812	793
46	776	757	799	901	1007	921	802	730	722	737	797	882	1028	969	875	798	776
47	759	741	789	897	1007	916	792	716	705	721	784	874	1026	964	865	785	759
48	742	724	777	891	1003	912	783	702	689	704	770	867	1025	961	854	771	742
49	723	707	766	884	999	906	771	688	670	686	755	859	1023	955	845	757	723
50	704	691	753	877	993	897	760	672	651	668	739	850	1020	949	833	742	704
51	685	674	741	869	980	887	748	655	631	649	722	840	1016	943	821	727	685
52	665	656	728	860	949	874	735	637	609	628	704	828	1006	935	808	711	665
53	645	638	714	848	898	858	721	618	586	606	686	810	977	926	793	694	645
54	624	620	699	833	825	827	706	598	563	584	667	777	917	911	779	676	624
55	602	602	685	807	728	778	689	578	538	562	647	722	827	879	762	658	602
56	580	582	668	764	620	708	672	556	513	538	626	645	717	822	745	638	580
57	557	562	650	703	510	622	650	534	487	514	603	557	599	737	727	618	557
58	534	542	630	622	423	526	626	509	461	490	578	464	479	637	705	597	534
59	509	522	607	531	360	429	600	485	433	464	550	371	371	531	681	576	509
60	485	499	582	437	324	356	568	459	406	438	519	293	305	425	654	552	485
61	460	477	553	353	309	299	526	431	378	410	478	248	279	335	619	528	460

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62	435	454	517	297	295	272	472	402	349	382	423	230	270	278	572	502	435
63	408	429	472	255	278	257	405	371	320	352	359	219	261	256	510	474	408
64	381	403	420	239	262	242	335	339	291	321	293	208	250	245	435	445	381
65	353	375	357	224	245	225	265	305	262	288	229	196	238	233	357	414	353
66	325	345	294	209	229	209	210	270	232	254	175	183	226	221	282	380	325
67	297	314	235	194	212	193	172	235	203	221	144	171	213	208	221	345	297
68	268	282	192	179	196	177	152	200	174	189	127	158	200	194	181	309	268
69	239	249	159	165	181	162	136	167	146	157	114	145	188	181	163	275	239
70	208	215	140	150	166	147	120	136	123	127	101	134	175	168	148	238	208
71	179	180	124	136	151	133	105	111	104	101	89	121	162	155	133	201	179
72	154	147	110	123	137	119	90	92	88	85	77	110	150	142	119	164	154
73	131	121	96	111	123	106	78	76	74	71	67	98	137	130	105	134	131
74	110	101	83	99	110	93	66	64	63	59	57	87	126	117	92	111	110
75	92	84	71	87	96	81	57	55	53	49	49	77	114	105	80	93	92
76	76	70	61	76	82	69	48	46	44	41	42	66	102	94	69	77	76
77	62	58	52	65	70	59	42	38	37	35	36	56	88	82	59	63	62
78	50	48	45	55	60	49	35	32	30	29	31	47	75	70	51	51	50
79	41	39	38	47	50	41	30	26	25	24	26	40	64	59	44	41	41
80	33	32	32	39	42	34	25	21	20	19	21	33	54	50	37	34	33
81	27	26	27	32	34	28	20	17	16	15	18	27	45	41	31	28	27
82	21	21	22	26	27	22	16	13	12	12	14	21	37	33	26	22	21
83	17	17	18	21	22	17	13	10	9	9	11	16	29	27	21	17	17
84	13	13	14	16	16	13	9	7	7	7	8	12	23	21	16	13	13
85	10	9	11	12	12	9	6	5	4	4	6	9	17	15	12	10	10
86	7	7	8	9	8	6	4	3	2	2	3	5	12	11	9	7	7
87	4	4	5	6	4	3	2	1	1	1	1	3	7	7	6	5	4
88	2	2	3	3	1	0	0	0	0	0	0	0	3	3	3	2	2
89	1	1	1	1	0	0	0	0	0	0	0	0	1	0	1	1	1
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	0
95	0	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	0
97	0	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	0
99	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
101	0	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	0
103	0	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	0
105	0	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	0
107	0	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	0
109	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	1	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
114	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
116	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
118	0	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	0
120	0	0	0	0	0	0	0	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	0
122	0	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	0
124	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

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126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	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
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	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
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	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
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	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
146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	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
151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	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
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

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158	0	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	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	1	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
170	0	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	0
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

2.3 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2015-07-18	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	IGTTU-1501850F-4BC (5000K)		

Electrical Measurement for Bare Lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150726	120.0	60	0.1666	18.59	0.9297	15.79
-C1	277.0	60	0.0749	18.92	0.9123	18.92

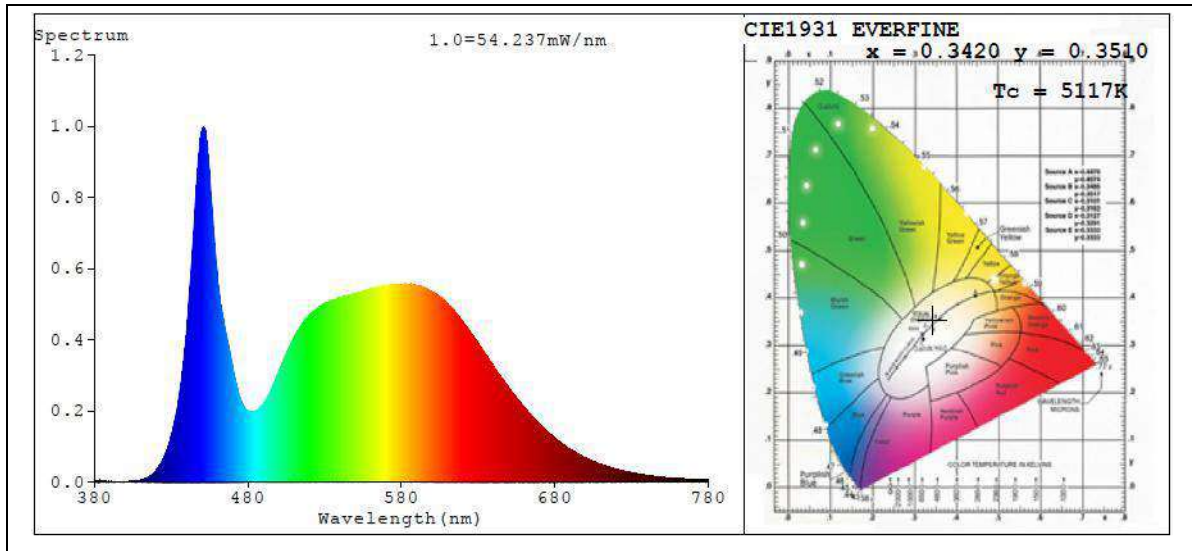
Sphere-Spectroradiometer Method for Bare Lamp:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	11
Frequency (Hz)	60	R2	87	R10	68
Color Rendering Index (CRI)	82.7	R3	90	R11	82
R9	11	R4	83	R12	59
CCT (K)	5117	R5	82	R13	83
Chromaticity (x, y)	x=0.3420 y=0.3510	R6	82	R14	94
Chromaticity (u', v')	u'=0.2096 v'=0.4839	R7	87	R15	77
Duv	0.0009	R8	69	--	--
Total Initial Lumen Output(lm)	2318				
Initial Lumen Efficacy(lm/w)	125.71				

Sphere-Spectroradiometer Method for Bare Lamp:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Initial Lumen Output(lm)	2358
Initial Lumen Efficacy(lm/w)	126.8

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 *******