



Report No.:GZE160529-B

LM-79-08 Test Report

For

LED Waves,Inc

(Brand Name: LED Waves)

4100 1st Ave ,The Esquire Building ,Brooklyn, NY 11232

2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces

Model name(s): SL2-2X2-40W-11
SL2-2X2-40W-10

Representative (Tested) Model: SL2-2X2-40W-11 (2700K)
SL2-2X2-40W-11 (5000K)

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

Test & Report By:

Jack Luo

Engineer: Jack Luo

Date:Jun.03,2016

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

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Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
SL2-2X2-40W-11 (2700K)	2700K	3675.3	36.40	100.97
SL2-2X2-40W-11 (3000K)	3000K	3796 ^{*1}	36.99 ^{*2}	102.65 ^{*3}
SL2-2X2-40W-11 (3500K)	3500K	3918 ^{*1}	36.99 ^{*2}	105.92 ^{*3}
SL2-2X2-40W-11 (4000K)	4000K	4039 ^{*1}	36.99 ^{*2}	109.20 ^{*3}
SL2-2X2-40W-11 (4500K)	4500K	4160 ^{*1}	36.99 ^{*2}	112.47 ^{*3}
SL2-2X2-40W-11 (5000K)	5000K	4281	37.57	113.94

*1: This value is calculated and the calculation formula is as below:

$$3796 = (4281 - 3675.3) / 5 + 3675.3$$

$$3918 = (4281 - 3675.3) / 5 + 3796$$

$$4039 = (4281 - 3675.3) / 5 + 3918$$

$$4160 = (4281 - 3675.3) / 5 + 4039$$

*2: This value is calculated and the calculation formula is as below:

$$36.99 = (37.57 + 36.40) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$102.65 = 3796 / 36.99$$

$$105.92 = 3918 / 36.99$$

$$109.20 = 4039 / 36.99$$

$$112.47 = 4160 / 36.99$$

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	Jun.03,2016
Test Report No.	GZE160529-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	LED Waves,Inc.	
Brand Name	LED Waves	
Model Number	SL2-2X2-40W-11 (2700K)	
SKU (if available)	N/A	
Type of Luminaire(for integral lamps, list base type and lamp type)	2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	

Electrical Measurements:
Integrating Sphere Output
Goniophotometer Output

Input Wattage	--	36.40	W
Input Current	--	0.3091	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9813	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	3675.3	lm
Initial Lumen Efficacy	--	100.97	lm/w
Correlated color temperature / CCT	2684	--	K
Color rendering index / CRI	83.7	--	
R9 Value	15	--	
Duv	0.0038	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	1277	cd
Beam angle (if applicable)		112.9	°
Zonal lumens in the 0 °-60 °zone		78.6	%
Zonal lumens in the 60 °-90 °zone		21.4	%
Zonal lumens in the 90 °-120 °zone		0	%
Zonal lumens in the 120 °-180 °zone		0	%

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Date of Test Report	Jun.03,2016
Test Report No.	GZE160529-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	LED Waves,Inc.		
Brand Name	LED Waves		
Model Number	SL-2X2-40W-11(5000K)		
SKU (if available)	N/A		
Type of Luminaire(for integral lamps, list base type and lamp type)	2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces		
Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A		

Electrical Measurements:
Integrating Sphere Output
Goniophotometer Output

Input Wattage	37.57	--	W
Input Current	0.3189	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9818	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	4281	--	lm
Initial Lumen Efficacy	113.94	--	lm/w
Correlated color temperature / CCT	4833	--	K
Color rendering index / CRI	83.2	--	
R9 Value	5	--	
Duv	0.0045	--	
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	: May.25, 2016
Date of Test	: May.27, 2016
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° Vertical intervals.

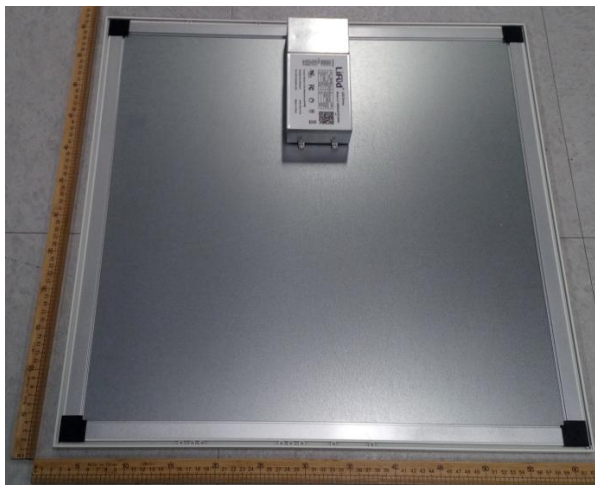
2. Photometric and Electrical Measurements – Integrating Sphere Method:

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	LED Waves
Model Number	SL2-2X2-40W-11 SL2-2X2-40W-10
Luminaire Type	2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces
Rated Voltage / Frequency	100 ~ 277 Vac, 50/60 Hz
Nominal Power	40W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K
LED Manufacturer	Shenzhen XuYu Optoelectronics Co.,Ltd
LED Model	XUYUSMD2835
Power Supply	SL2-2X2-40W-11: LF-GMD045YB(P)1000U LF-GMD045YB1000U SL2-2X2-40W-10: LF-GMR045YB(P)1000U
Sample Receipt Date	May.25, 2016
Sample Number	GZE160529-B1(2700K),B2(5000K)

Photo



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

Test date	2016-05-27	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SL2-2X2-40W-11(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160529	120.0	60	0.3091	36.40	0.9813	7.14
-B1	277.0	60	0.1449	36.20	0.9017	15.27

Sphere-Spectroradiometer Method:

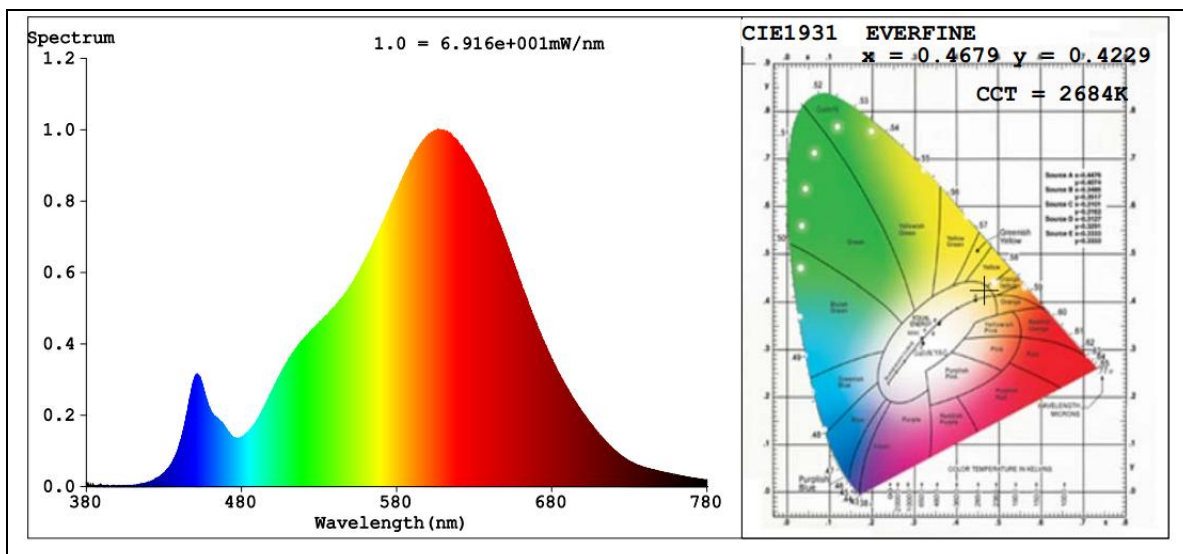
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	83.7
R9	15
CCT (K)	2684
Chromaticity (x, y)	x=0.4679 y=0.4229
Chromaticity (u', v')	u'=0.2622 v'=0.5332
Duv	0.0038

Special Color Rendering Indices			
R1	82	R9	15
R2	90	R10	79
R3	98	R11	81
R4	82	R12	71
R5	81	R13	83
R6	89	R14	99
R7	85	R15	74
R8	62	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	3675.3
Luminous Efficacy (lm/W)	100.97
Beam Angle °	112.9
Center Beam Candle Power (cd)	1277
S/MH(C0/180)	1.26
S/MH(C90/270)	1.26
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	3652.4
Luminous Efficacy (lm/W)	100.90

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	993.0	27%
0-40	1,628.6	44.3%
0-60	2,887.8	78.6%
60-90	786.0	21.4%
70-100	330.3	9%
90-120	0.2	0%
0-90	3,673.7	100%
90-180	1.2	0%
0-180	3,675.0	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	120.8	3.3%	90-100	0.0	0%
10-20	346.4	9.4%	100-110	0.0	0%
20-30	525.8	14.3%	110-120	0.2	0%
30-40	635.6	17.3%	120-130	0.3	0%
40-50	661.2	18.0%	130-140	0.3	0%
50-60	598.0	16.3%	140-150	0.2	0%
60-70	455.7	12.4%	150-160	0.1	0%
70-80	262.3	7.1%	160-170	0.1	0%
80-90	68.0	1.8%	170-180	0.0	0%

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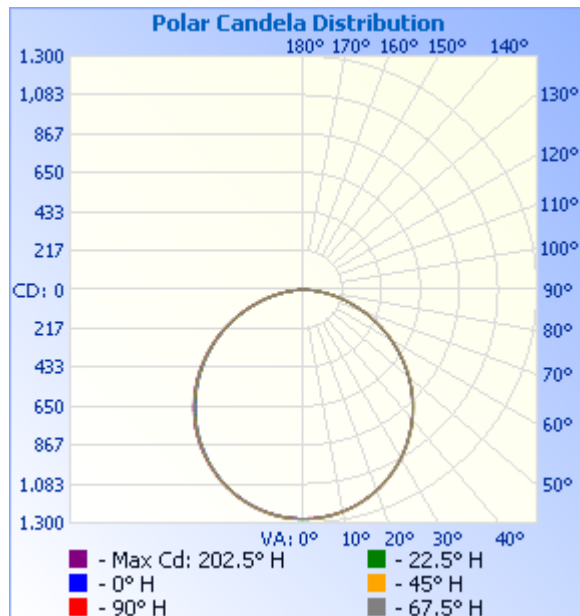
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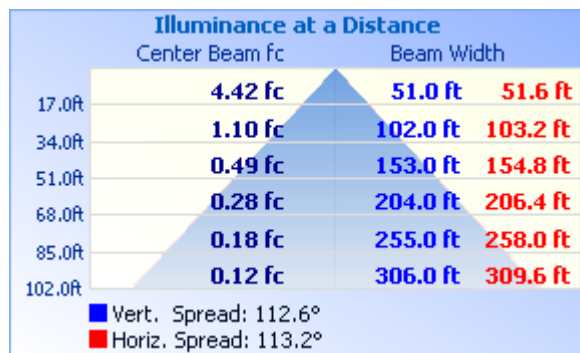
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Photometric Data



Illuminance Plots



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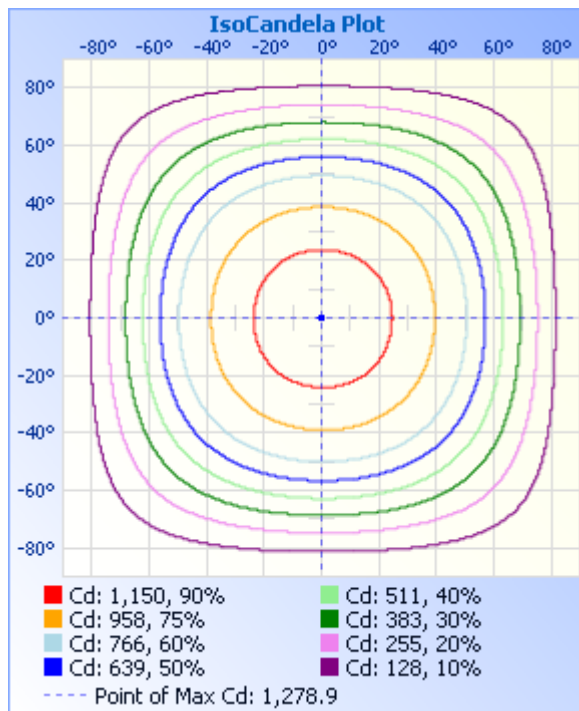
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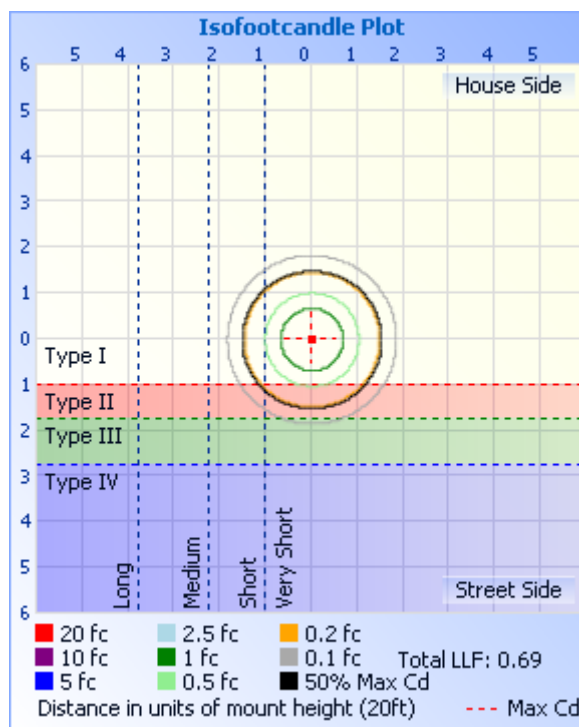
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ISOCANDELA DIAGRAM



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	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277	1277
1	1277	1278	1278	1277	1275	1278	1277	1277	1276	1279	1277	1277	1277	1277	1277	1276	1277
2	1277	1277	1277	1276	1274	1277	1276	1276	1274	1277	1276	1276	1275	1276	1276	1277	1277
3	1275	1277	1277	1275	1273	1275	1275	1273	1274	1275	1276	1275	1273	1275	1275	1274	1275
4	1273	1274	1275	1273	1272	1275	1273	1273	1272	1275	1275	1273	1272	1274	1274	1273	1273
5	1272	1273	1273	1271	1270	1271	1271	1272	1271	1273	1273	1270	1269	1272	1272	1272	1272
6	1268	1271	1271	1269	1268	1269	1269	1269	1269	1271	1271	1268	1268	1270	1268	1270	1268
7	1266	1267	1266	1266	1264	1266	1265	1266	1264	1268	1267	1266	1265	1267	1266	1266	1266
8	1263	1264	1263	1263	1261	1262	1261	1262	1260	1264	1263	1262	1262	1264	1263	1264	1263
9	1259	1260	1260	1257	1257	1259	1259	1258	1258	1260	1262	1259	1258	1259	1259	1259	1259
10	1255	1256	1255	1252	1254	1255	1253	1253	1253	1256	1257	1255	1254	1256	1255	1256	1255
11	1250	1252	1252	1249	1249	1250	1249	1249	1249	1251	1251	1249	1249	1251	1251	1250	1250
12	1244	1246	1246	1245	1244	1245	1245	1244	1244	1246	1246	1245	1244	1246	1245	1245	1244
13	1240	1241	1241	1240	1238	1240	1239	1238	1238	1240	1241	1238	1239	1242	1239	1240	1240
14	1234	1234	1235	1234	1232	1233	1233	1232	1232	1234	1234	1234	1233	1235	1234	1234	1234
15	1227	1228	1228	1227	1227	1227	1227	1226	1226	1227	1228	1228	1228	1229	1227	1228	1227
16	1221	1222	1222	1220	1219	1220	1220	1219	1219	1220	1221	1222	1220	1222	1221	1221	1221
17	1213	1214	1214	1213	1211	1212	1212	1211	1212	1213	1215	1214	1214	1215	1214	1214	1213
18	1205	1206	1206	1205	1204	1204	1204	1204	1203	1205	1205	1206	1206	1208	1206	1206	1205
19	1197	1200	1199	1198	1197	1197	1197	1195	1197	1198	1199	1199	1199	1200	1199	1199	1197
20	1189	1191	1190	1190	1188	1188	1187	1188	1187	1188	1190	1189	1190	1191	1190	1190	1189
21	1180	1182	1181	1181	1180	1180	1179	1177	1178	1180	1181	1181	1180	1183	1181	1181	1180
22	1172	1172	1173	1172	1171	1171	1169	1167	1168	1170	1171	1171	1172	1174	1172	1172	1172
23	1162	1162	1162	1161	1161	1161	1160	1158	1159	1160	1161	1162	1163	1164	1162	1162	1162
24	1152	1153	1153	1151	1151	1151	1150	1148	1149	1150	1152	1152	1153	1154	1152	1151	1152
25	1142	1142	1142	1140	1140	1140	1139	1137	1138	1140	1141	1141	1142	1144	1143	1142	1142
26	1131	1132	1131	1130	1130	1129	1128	1126	1127	1129	1130	1131	1132	1133	1131	1131	1131
27	1119	1120	1119	1119	1118	1118	1117	1115	1116	1118	1119	1120	1121	1121	1120	1120	1119
28	1108	1109	1108	1107	1106	1107	1105	1104	1104	1105	1107	1108	1110	1111	1108	1108	1108
29	1097	1096	1096	1096	1094	1095	1093	1092	1093	1093	1095	1097	1097	1098	1097	1095	1097

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30	1084	1084	1085	1084	1083	1083	1081	1079	1079	1081	1084	1085	1085	1086	1085	1084	1084
31	1071	1071	1072	1071	1070	1070	1068	1067	1066	1068	1071	1072	1072	1074	1073	1072	1071
32	1058	1059	1058	1059	1057	1057	1055	1054	1053	1057	1058	1059	1059	1061	1060	1058	1058
33	1044	1046	1045	1044	1043	1043	1041	1040	1039	1042	1043	1046	1046	1048	1047	1045	1044
34	1031	1032	1031	1031	1031	1030	1027	1026	1026	1028	1030	1033	1033	1035	1033	1030	1031
35	1016	1017	1018	1016	1016	1016	1013	1013	1011	1014	1016	1017	1019	1020	1019	1018	1016
36	1002	1003	1004	1002	1001	1002	1000	997	997	999	1002	1004	1005	1006	1004	1003	1002
37	987	989	989	988	987	987	985	983	982	984	987	988	991	992	990	989	987
38	973	974	974	973	971	972	970	967	966	969	972	974	976	977	975	973	973
39	956	958	958	958	956	957	954	952	952	954	956	959	959	961	959	957	956
40	941	943	942	942	941	941	939	936	935	938	941	942	944	946	944	942	941
41	926	927	927	926	924	925	923	920	919	922	925	927	928	930	929	926	926
42	909	910	911	910	908	908	906	903	902	905	909	910	912	913	912	910	909
43	892	893	894	894	892	892	889	886	886	889	892	894	895	897	895	893	892
44	874	877	877	877	875	875	872	870	868	872	875	877	878	880	878	876	874
45	856	859	860	859	857	858	855	852	851	854	858	859	861	863	860	859	856
46	840	841	842	841	840	840	838	834	834	837	840	842	844	845	844	841	840
47	821	823	824	823	823	822	819	816	816	818	822	824	826	827	826	822	821
48	803	805	806	805	805	804	802	799	798	800	804	806	808	809	808	805	803
49	784	786	788	787	786	786	783	779	779	782	785	788	789	792	790	785	784
50	766	767	769	768	767	768	764	761	761	764	767	769	770	772	771	768	766
51	746	748	750	749	748	749	746	743	742	744	748	751	751	753	752	748	746
52	727	729	731	730	729	729	726	723	723	725	729	730	732	734	733	729	727
53	707	709	712	711	709	709	707	704	703	706	709	712	713	714	713	709	707
54	688	689	691	691	689	690	687	684	684	686	690	692	693	695	694	689	688
55	667	669	672	671	669	670	668	664	663	666	670	672	673	675	674	669	667
56	648	649	652	651	650	650	647	644	643	646	649	653	653	655	653	649	648
57	627	629	632	631	630	630	627	624	623	626	630	631	633	635	633	629	627
58	607	608	610	610	609	609	607	603	602	605	609	611	612	615	612	608	607
59	586	587	589	590	588	588	586	582	581	584	588	591	592	593	591	587	586
60	565	566	569	569	567	568	565	562	561	564	567	570	571	573	570	566	565
61	544	545	547	548	546	546	543	540	540	543	546	548	550	551	549	546	544

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62	523	524	526	527	525	525	522	519	519	522	525	527	529	531	528	524	523
63	502	502	504	505	504	504	501	499	498	501	504	506	507	510	506	504	502
64	480	482	483	484	483	482	479	477	476	479	483	485	486	489	485	482	480
65	459	460	461	463	462	461	458	456	456	458	461	464	464	467	463	461	459
66	438	438	440	441	440	439	436	434	434	436	439	443	443	445	441	439	438
67	416	417	418	419	419	418	415	413	413	415	418	421	422	423	420	417	416
68	395	395	397	398	397	396	393	391	391	393	396	400	400	402	398	396	395
69	374	374	375	376	376	375	372	370	370	372	374	378	379	380	377	375	374
70	352	352	353	354	355	353	350	349	349	350	353	357	357	358	355	354	352
71	331	331	332	333	333	331	329	328	327	329	332	335	336	337	333	332	331
72	310	310	311	312	312	310	307	306	306	308	310	314	315	315	313	311	310
73	289	289	289	290	290	289	286	285	285	287	289	292	294	294	291	290	289
74	268	268	268	269	269	268	266	264	264	266	268	271	272	273	270	269	268
75	247	247	247	248	249	247	245	244	244	245	247	251	252	252	249	248	247
76	227	227	227	228	228	227	225	223	224	225	227	230	231	231	229	228	227
77	207	207	207	207	207	206	205	203	204	205	207	210	211	211	206	208	207
78	187	187	188	187	187	186	185	184	184	185	187	189	190	190	189	188	187
79	168	168	168	167	167	166	166	165	165	166	168	169	170	170	170	168	168
80	148	148	149	147	148	147	146	146	146	147	148	149	150	150	150	149	148
81	130	130	130	129	129	127	127	128	127	128	130	130	131	131	131	130	130
82	111	112	111	110	110	109	109	110	109	110	111	111	112	112	112	112	111
83	94	94	93	92	93	91	91	92	92	93	93	93	94	94	94	94	94
84	77	77	75	75	75	74	73	74	74	76	75	76	76	76	76	77	77
85	60	60	58	58	59	57	56	57	58	59	58	58	60	59	59	60	60
86	44	44	42	42	43	41	40	42	42	42	42	43	44	43	43	44	44
87	29	28	26	26	27	26	25	26	27	26	26	27	28	28	27	28	29
88	15	14	13	12	13	12	11	12	13	13	12	13	14	14	13	14	15
89	3	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	3
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	0	0	0	0	0	0	0
111	0	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	0
113	0	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	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	0	0	0	0	0	0
117	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
122	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
123	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
124	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
125	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1

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

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158	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
159	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
160	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
161	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
162	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
163	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
164	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
165	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
166	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
167	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
168	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
169	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1
170	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
171	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
172	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
173	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
174	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1
175	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
176	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
177	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
178	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
179	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

IES LM-79 2008

Test date	2016-05-27	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SL2-2X2-40W-11(5000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160529	120.0	60	0.3189	37.57	0.9818	7.09
-B2	277.0	60	0.1479	36.90	0.9009	15.63

Sphere-Spectroradiometer Method:

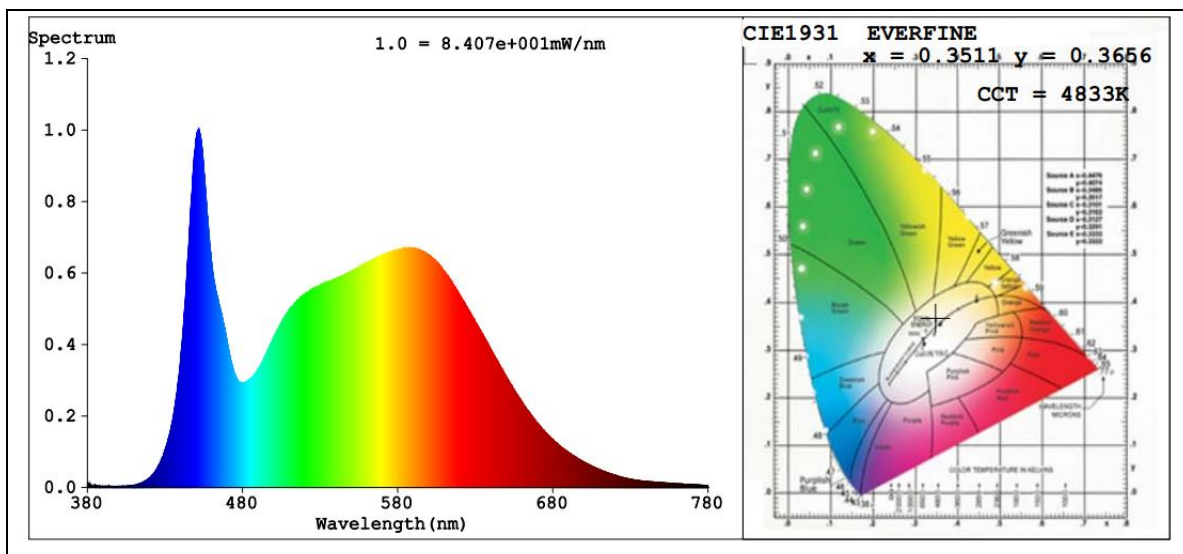
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	83.2
R9	5
CCT (K)	4833
Chromaticity (x, y)	x=0.3511 y=0.3656
Chromaticity (u', v')	u'=0.2101 v'=0.4922
Duv	0.0045
Total Luminous (lm)	4281
Luminous Efficacy (lm/W)	113.94

Special Color Rendering Indices			
R1	81	R9	5
R2	90	R10	75
R3	95	R11	80
R4	81	R12	58
R5	81	R13	83
R6	85	R14	98
R7	87	R15	74
R8	66	--	--

Sphere-Spectroradiometer Method for 277V:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Initial Lumen Output(lm)	4196
Initial Lumen Efficacy(lm/w)	113.71

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 *******