

**LM-79-08 Test Report**

For

**Revolution Lighting Technologies, Inc.  
(Brand Name: Revolution Lighting Technologies)**

2280 Ward Ave. Simi Valley CA. 93065

**Internal Driver/Line Voltage Lamp-Style Retrofit  
Kits (UL Type B)**Model name(s): 202110-111  
202110-112  
202110-113  
202110-115Remark: This is a multiple list report, the original report NO. is  
GZE1707084-A.Representative (Tested) Model: 202110-111  
202110-115

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

Test &amp; Report By:

*Garman Mo*

Engineer: Garman Mo

Date: Jul.27,2017

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>

**1.1 Product Information:**

Organization Name	Revolution Lighting Technologies, Inc.	
Brand Name	Revolution Lighting Technologies	
Model Number	202110-111 202110-112 202110-113 202110-115	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Internal Driver/Line Voltage Lamp-Style Retrofit Kits (UL Type B)	
Rated Voltage / Frequency	120 ~ 277 Vac, 50/60 Hz	
Nominal Power	8W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,5000K	
LED Manufacturer	EVERLIGHT ELECTRONICS CO., LTD	
LED Model	67-21S Series (3000K)	
Sample Number	GZE1707084-A1,A2,A3(3000K),A4(5000K)	
Lamp Length	600	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**



**1.2 Test Specifications:**

Date of Receipt	Jul.21,2017
Date of Test	Jul.22,2017
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	QD25

**1.3 Test Methods**

**1) Photometric and Light Distribution Measurement – Goniophotometer Method:**

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C ± 1° 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 or rated 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) Chromaticity Measurement – Sphere-Spectroradiometer Method:**

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° 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 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

**3) Electrical Measurements:**

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25° C ± 1° C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

**2.1 Electrical, Photometric and Chromaticity Measurements**

*(Refer to Work Instruction QD25)*

<b>Test date</b>	2017-07-22	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	202110-111, Connected to line voltage		

**Electrical Measurement for Bare-lamp:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170708	120.0	60	0.0658	7.750	0.9816	16.02
4-A1	277.0	60	0.0324	8.080	0.9014	22.69
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

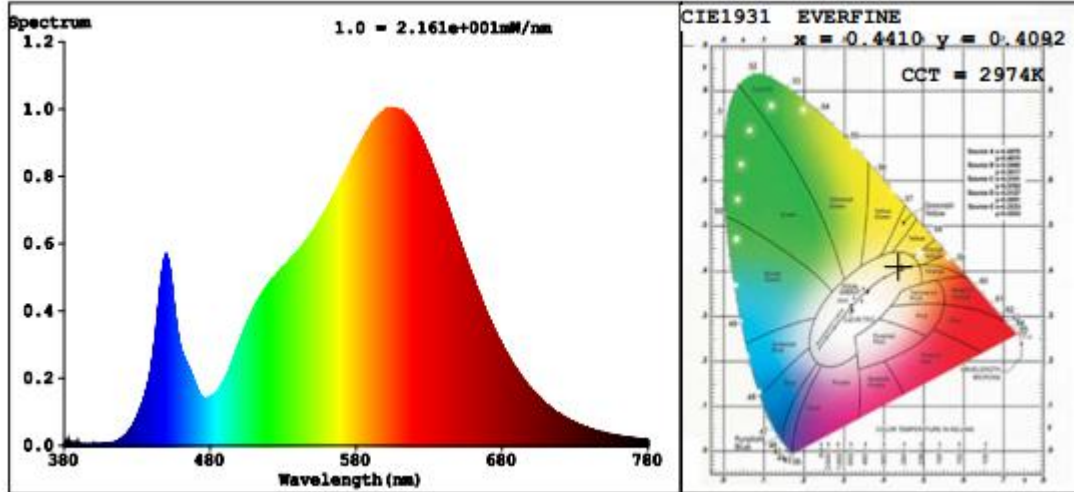
**Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	9
Frequency (Hz)	60	R2	89	R10	75
CCT (K)	2974	R3	96	R11	81
Duv	0.0015	R4	81	R12	66
Chromaticity (x, y)	x=0.4410 y=0.4092	R5	80	R13	82
Chromaticity (u', v')	u'=0.2510 v'=0.5240	R6	86	R14	98
Color Rendering Index (CRI)	82.4	R7	85	R15	73
R9	9	R8	61	--	--

**Photometric Measurement for Bare-lamp –Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	1128	1146	Bare Lamp: 800(±10%)
Luminous Efficacy (lm/W)	145.56	141.87	Bare lamp: >= 110(-3%)
Most worst Luminous/Highest Watts	139.60		

**Spectral Power Distribution & Chromaticity Diagram**



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**2.2 Electrical, Photometric and Chromaticity Measurements**

*(Refer to Work Instruction QD25)*

<b>Test date</b>	2017-07-22	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	202110-111, Connected to line voltage		

**Electrical Measurement for 3-lamp in Lithonia 2GT8 lensed 2x2:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170708	120.0	60	0.1982	23.25	0.9774	16.51
4-A1,A2,A3	277.0	60	0.0975	24.24	0.8974	23.20
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

**Chromaticity Measurement for 3-lamp in Lithonia 2GT8 lensed 2x2 - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	9
Frequency (Hz)	60	R2	89	R10	75
CCT (K)	2943	R3	97	R11	80
Duv	0.0012	R4	81	R12	67
Chromaticity (x, y)	x=0.4428 y=0.4090	R5	80	R13	82
Chromaticity (u', v')	u'=0.2522 v'=0.5242	R6	86	R14	98
Color Rendering Index (CRI)	82.3	R7	84	R15	73
R9	9	R8	61	--	--

**Photometric Measurement 3-lamp in Lithonia 2GT8 lensed 2x2 –**

**Goniophotometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2746.1	2762.1	In luminaire (3 lamps): 2000(±10%)
Luminous Efficacy (lm/W)	118.11	113.95	In luminaire: >= 100(-3%)
Most worst Luminous/Highest Watts	113.29		
Zonal lumens in the 0-60° zone (%)	84.5	--	>= 75(-3)
SC: 0-180° (if applicable)	1.27	--	1.0-2.0(±0.1)
SC: 90-270° (if applicable)	1.15	--	1.0-2.0(±0.1)
Beam Angle (°)	95.8	--	--
Center Beam Candle Power (cd)	1162	--	--

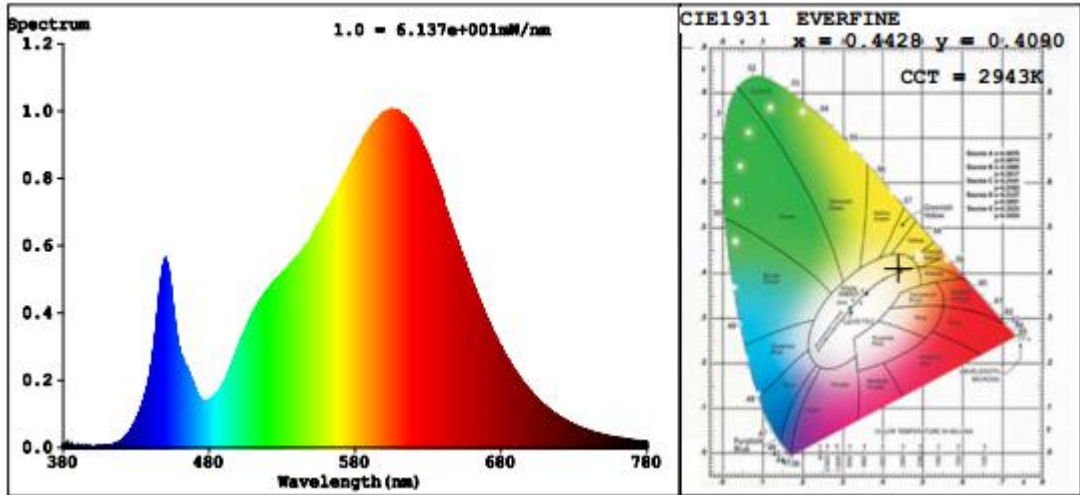
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**Spectral Power Distribution & Chromaticity Diagram**



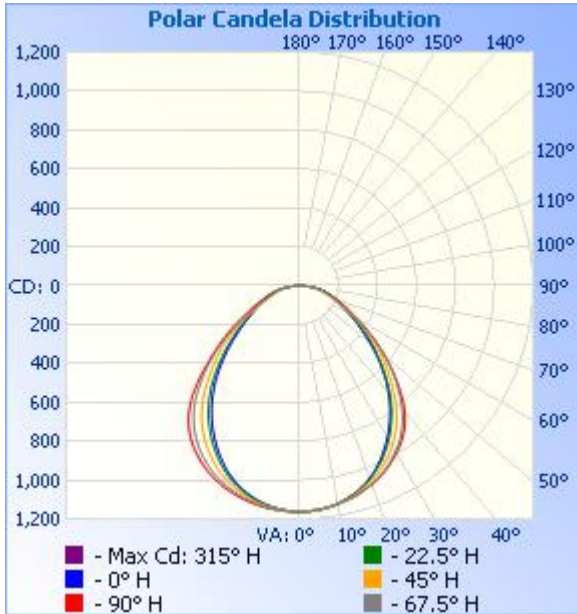
**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	891.8	32.5%
0-40	1,434.9	52.3%
0-60	2,319.2	84.5%
60-90	423.5	15.4%
70-100	188.0	6.8%
90-120	1.0	0%
0-90	2,742.8	99.9%
90-180	3.0	0.1%
0-180	2,745.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	109.8	4.0%	90-100	0.0	0%
10-20	313.4	11.4%	100-110	0.4	0%
20-30	468.6	17.1%	110-120	0.6	0%
30-40	543.1	19.8%	120-130	0.7	0%
40-50	506.4	18.4%	130-140	0.6	0%
50-60	378.0	13.8%	140-150	0.4	0%
60-70	235.6	8.6%	150-160	0.2	0%
70-80	141.6	5.2%	160-170	0.1	0%
80-90	46.4	1.7%	170-180	0.0	0%



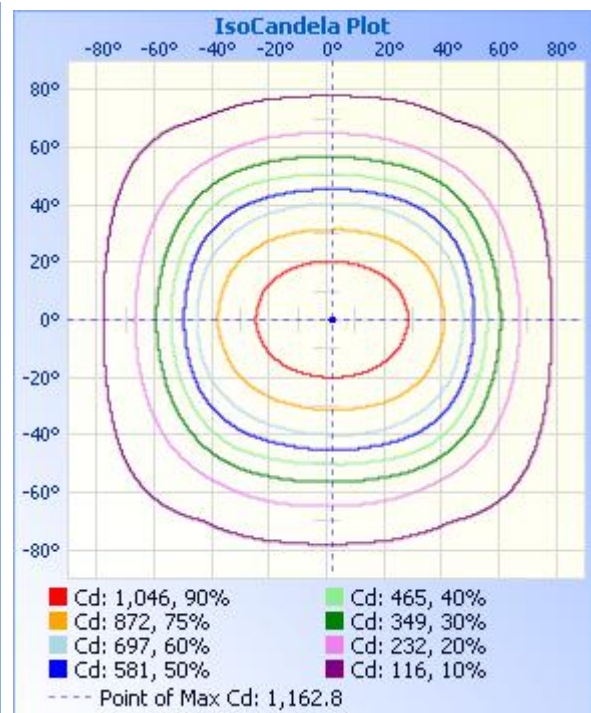
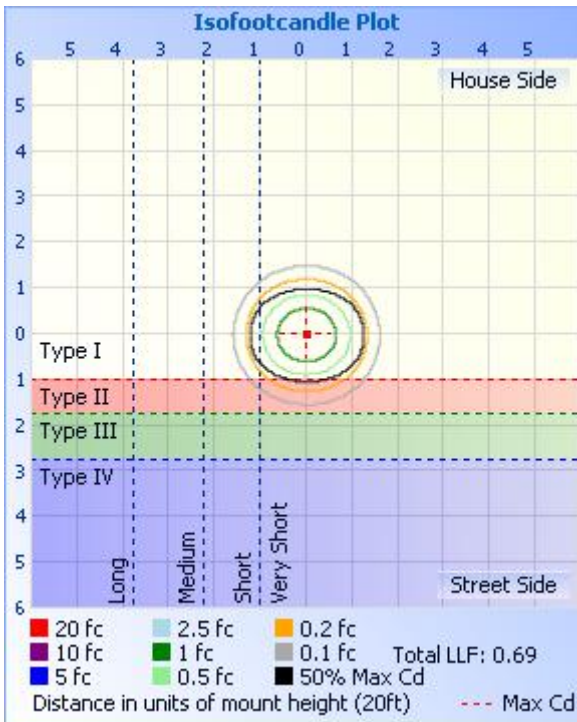
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	<b>4.02 fc</b>	<b>34.4 ft</b>	<b>41.4 ft</b>
34.0ft	<b>1.00 fc</b>	<b>68.7 ft</b>	<b>82.8 ft</b>
51.0ft	<b>0.45 fc</b>	<b>103.1 ft</b>	<b>124.2 ft</b>
68.0ft	<b>0.25 fc</b>	<b>137.5 ft</b>	<b>165.6 ft</b>
85.0ft	<b>0.16 fc</b>	<b>171.8 ft</b>	<b>207.0 ft</b>
102.0ft	<b>0.11 fc</b>	<b>206.2 ft</b>	<b>248.4 ft</b>

■ Vert. Spread: 90.6°  
■ Horiz. Spread: 101.2°



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Table--1 UNIT: cd

C (DEG) \ y (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	1162	1162	1162	1162	1162	1162	1162	1162	1162	1162	1162	1162	1162	1162	1162	1162
5	1160	1160	1159	1158	1156	1156	1156	1155	1155	1154	1152	1153	1153	1155	1156	1159
10	1150	1149	1145	1140	1137	1138	1139	1140	1139	1137	1134	1130	1130	1135	1140	1146
15	1134	1130	1120	1109	1103	1105	1110	1116	1117	1111	1102	1094	1093	1100	1112	1126
20	1109	1102	1083	1062	1053	1057	1071	1084	1087	1076	1060	1042	1039	1051	1073	1096
25	1075	1064	1033	999	984	994	1019	1042	1047	1031	1004	974	967	985	1021	1057
30	1030	1012	968	922	902	915	952	986	994	971	932	892	883	906	954	1004
35	971	943	887	834	810	824	868	914	930	897	843	798	789	817	875	935
40	888	856	794	737	710	721	764	818	840	799	738	691	685	716	775	847
45	769	737	672	623	599	608	651	703	713	687	627	579	571	598	656	729
50	615	606	560	504	487	503	546	583	581	564	523	474	458	484	544	597
55	479	467	443	398	384	401	433	450	456	430	410	376	362	380	427	457
60	357	335	322	302	301	308	322	329	343	316	304	290	285	289	309	330
65	261	238	224	233	237	238	232	244	261	235	218	227	225	224	215	235
70	196	176	160	185	187	188	167	184	198	176	158	180	179	177	154	175
75	146	132	120	143	145	142	123	136	145	129	118	136	140	135	119	131
80	98.4	88.7	88.7	99.9	102	97.1	89.5	90.8	98.9	86.4	83.9	92.7	95.4	93.0	84.9	88.0
85	43.2	40.6	43.5	52.4	50.6	50.3	42.6	42.5	43.3	38.8	35.8	43.3	40.6	44.6	38.0	39.8
90	0.00	0.01	0.02	0.07	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.29	0.29	0.00	0.00	0.00	0.35	0.00	0.25	0.35	0.10	0.00	0.00	0.00	0.06	0.35
105	0.70	0.76	0.12	0.00	0.00	0.43	0.64	0.76	1.12	0.60	0.24	0.00	0.00	0.00	0.12	0.42
110	0.66	0.76	0.31	0.17	0.00	0.63	0.94	0.94	1.12	0.82	0.54	0.00	0.00	0.00	0.29	0.41
115	0.72	0.76	0.43	0.47	0.00	0.46	1.31	1.23	1.41	1.06	0.82	0.06	0.00	0.00	0.47	0.43
120	0.76	0.95	0.49	0.33	0.00	0.49	1.42	1.59	1.45	1.23	0.74	0.29	0.00	0.18	0.44	0.45
125	1.05	1.00	0.62	0.41	0.41	0.62	1.42	1.59	1.49	1.31	0.71	0.44	0.29	0.39	0.40	0.48
130	1.23	1.00	0.50	0.41	0.42	0.68	0.71	1.59	1.53	1.35	0.63	0.59	0.39	0.49	0.37	0.50
135	1.29	0.94	0.41	0.41	0.51	0.69	0.63	1.59	1.41	0.94	0.53	0.62	0.45	0.57	0.34	0.52
140	1.12	0.88	0.31	0.41	0.51	0.70	0.70	1.00	1.23	0.87	0.24	0.55	0.51	0.54	0.31	0.50
145	1.12	0.85	0.19	0.41	0.50	0.65	0.30	0.76	1.25	0.84	0.27	0.51	0.57	0.59	0.32	0.48
150	1.00	0.76	0.11	0.53	0.49	0.50	0.25	0.72	1.17	0.80	0.29	0.56	0.58	0.61	0.38	0.42
155	0.82	0.59	0.06	0.64	0.49	0.46	0.06	0.64	0.70	0.65	0.30	0.51	0.59	0.64	0.44	0.23
160	0.65	0.31	0.00	0.53	0.48	0.42	0.06	0.65	0.63	0.53	0.32	0.38	0.59	0.69	0.44	0.23
165	0.57	0.22	0.00	0.24	0.47	0.24	0.06	0.32	0.55	0.50	0.35	0.29	0.59	0.74	0.50	0.23
170	0.53	0.18	0.00	0.41	0.41	0.47	0.06	0.23	0.49	0.44	0.26	0.35	0.88	0.94	0.52	0.17
175	0.49	0.26	0.00	0.65	0.88	0.51	0.06	0.19	0.48	0.42	0.15	0.00	0.76	0.88	0.53	0.06
180	0.35	0.23	0.00	0.70	0.76	0.53	0.06	0.12	0.53	0.41	0.24	0.00	0.70	0.76	0.53	0.06

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**2.3 Electrical, Photometric and Chromaticity Measurements**

*(Refer to Work Instruction QD25)*

<b>Test date</b>	2017-07-22	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	202110-115, Connected to line voltage		

**Electrical Measurement for Bare-lamp:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170708	120.0	60	0.0672	7.906	0.9802	16.34
4-A4	277.0	60	0.0328	8.176	0.9001	22.92
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

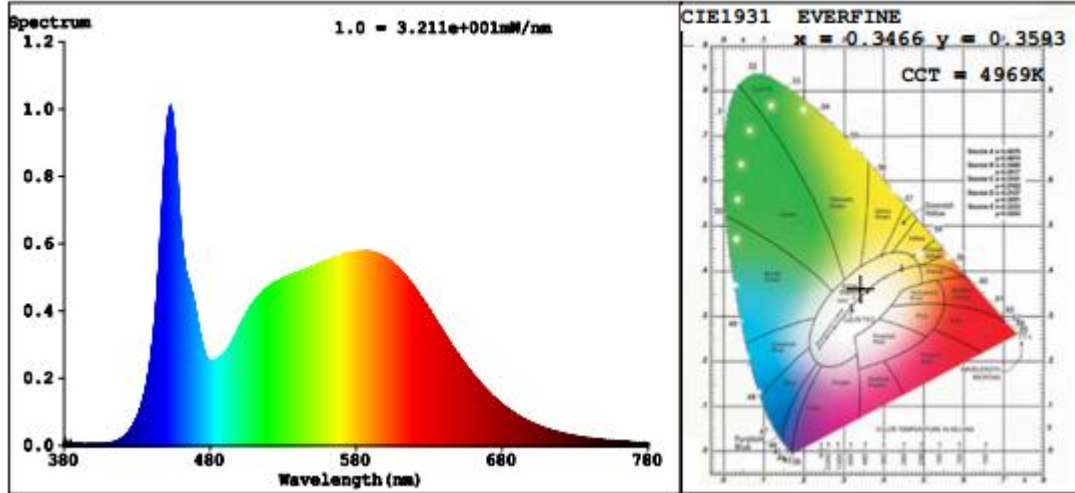
**Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	9
Frequency (Hz)	60	R2	90	R10	75
CCT (K)	4969	R3	95	R11	80
Duv	0.0032	R4	81	R12	55
Chromaticity (x, y)	x=0.3466 y=0.3593	R5	81	R13	84
Chromaticity (u', v')	u'=0.2095 v'=0.4886	R6	85	R14	97
Color Rendering Index (CRI)	83.4	R7	87	R15	76
R9	9	R8	67	--	--

**Photometric Measurement for Bare-lamp –Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	1185	1195	Bare Lamp: 800(±10%)
Luminous Efficacy (lm/W)	149.89	146.17	Bare lamp: >= 110(-3%)
Most worst Luminous/Highest Watts	144.94		

**Spectral Power Distribution & Chromaticity Diagram**



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**2.3 Performance Assessment:**

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
202110-111	3000K	1128	7.750	145.56
202110-112	3500K	1142*1	7.828*2	145.89*3
202110-113	4000K	1157*1	7.828*2	147.80*3
202110-115	5000K	1185	7.906	149.89

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

$$1142 = (1185 - 1128) / 4 + 1128$$

$$1157 = (1185 - 1128) / 4 + 1142$$

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

$$7.828 = (7.750 + 7.906) / 2$$

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

$$145.89 = 1142 / 7.828$$

$$147.80 = 1157 / 7.828$$

### 3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06
Expand Uncertainty: Photometric Measurement (Sphere):2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.36%, k=2			

\*\*\*\*\* END OF REPORT \*\*\*\*\*

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