

**LM-79-08 Test Report**

For

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

2280 Ward Ave. Simi Valley CA. 93065

**2x2 Luminaires for Ambient Lighting of Interior  
Commercial Spaces**Model name(s): 151054-101  
151054-102  
151054-103  
151054-105Remark: This is a multiple list report, the original report NO. is  
GZE1704041-J.Representative (Tested) Model: 151054-101  
151054-105

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

Test &amp; Report By:

*Garman Mo*

Engineer: Garman Mo

Date: Apr.25,2017

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

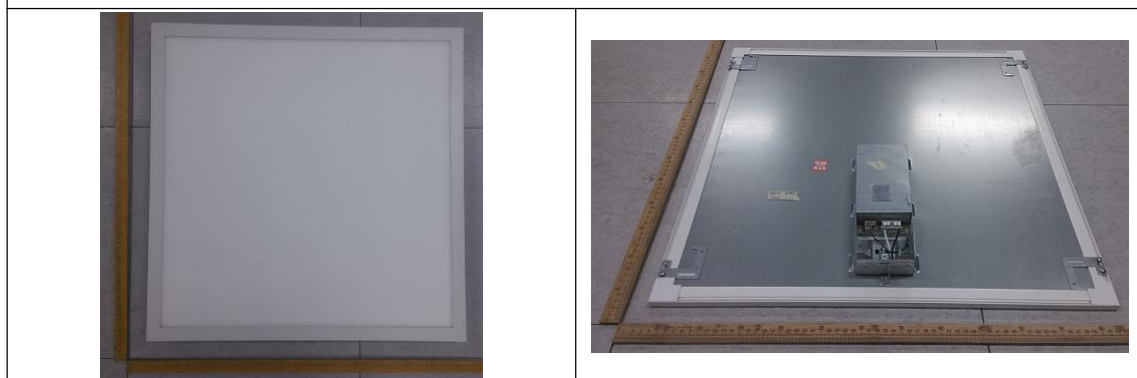
Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

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	151054-101 151054-102 151054-103 151054-105	
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	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	40W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,5000K	
LED Manufacturer	EVERLIGHT ELECTRONICS CO., LTD	
LED Model	67-21S Series (3000K)	
Sample Number	GZE1704041-J1(3000K),J2(5000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**



**1.2 Test Specifications:**

Date of Receipt	Apr.24,2017
Date of Test	Apr.25,2017
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**

<p><b>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</b>                  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.</p>
<p><b>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</b>                  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.</p>
<p><b>3) Electrical Measurements:</b>                  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.</p>

**2.1 Electrical, Photometric and Chromaticity Measurements**  
*(Refer to Work Instruction QD25)*

<b>Test date</b>	2017-04-25	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	151054-101		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170404	120.0	60	0.3205	37.92	0.9861	11.47
1-J1	277.0	60	0.1456	37.31	0.9249	13.86
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

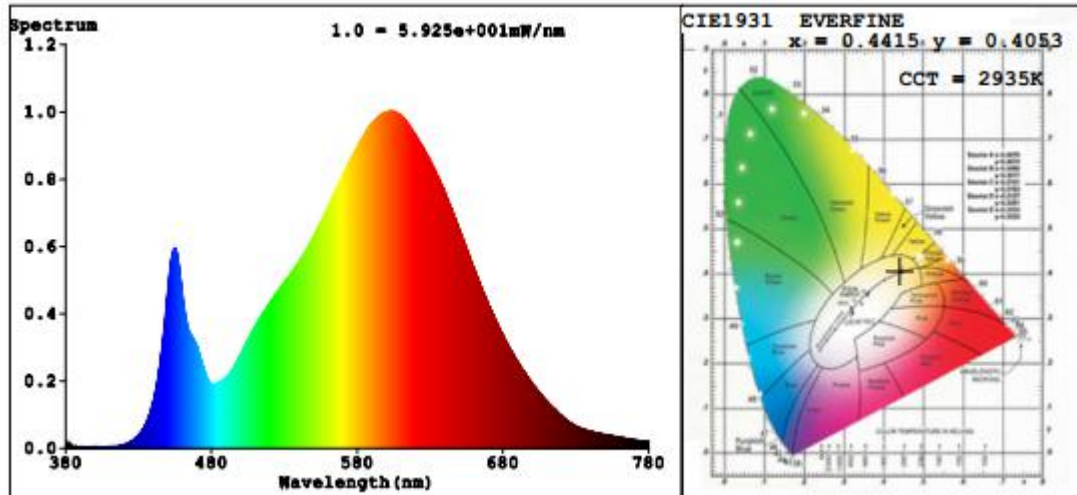
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	10
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	2935	R3	96	R11	75
Duv	-0.0001	R4	77	R12	65
Chromaticity (x, y)	x=0.4415 y=0.4053	R5	79	R13	82
Chromaticity (u', v')	u'=0.2530 v'=0.5225	R6	87	R14	99
Color Rendering Index (CRI)	81.5	R7	83	R15	73
R9	10	R8	59	--	--

**Photometric Measurement – Goniophotometer Method:**

Parameter	Result		DLC V4.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	4787.9	4768.9	≥2000(-10%)	
Luminous Efficacy (lm/W)	126.26	127.82	Standard: ≥100(-3%)	Premium: ≥125(-3%)
Zonal lumens in the 0-60° zone (%)	78.5	--	≥75(-3)	
SC: 0-180° (if applicable)	1.29	--	1.0-2.0(±0.1)	
SC: 90-270° (if applicable)	1.24	--	1.0-2.0(±0.1)	
Beam Angle (°)	112.8	--	--	
Center Beam Candle Power (cd)	1657	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

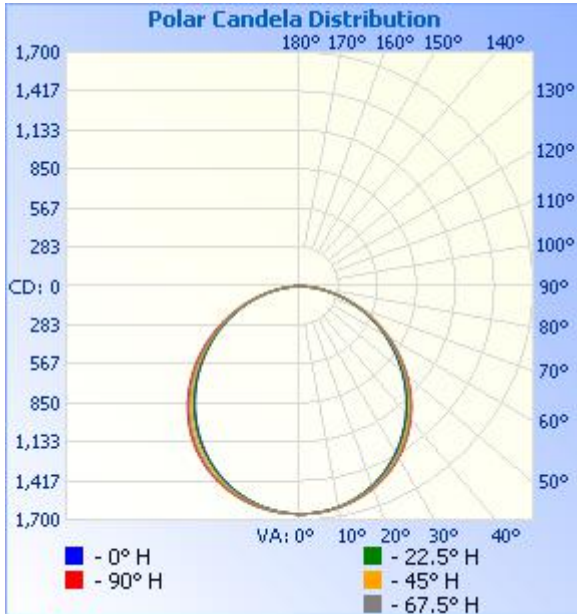


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,294.4	27%
0-40	2,124.3	44.4%
0-60	3,757.0	78.5%
60-90	1,028.5	21.5%
70-100	439.1	9.2%
90-120	0.4	0%
0-90	4,785.5	100%
90-180	2.0	0%
0-180	4,787.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	156.9	3.3%	90-100	0.0	0%
10-20	450.9	9.4%	100-110	0.1	0%
20-30	686.6	14.3%	110-120	0.3	0%
30-40	829.9	17.3%	120-130	0.5	0%
40-50	859.6	18.0%	130-140	0.4	0%
50-60	773.1	16.1%	140-150	0.3	0%
60-70	589.4	12.3%	150-160	0.2	0%
70-80	345.5	7.2%	160-170	0.1	0%
80-90	93.6	2.0%	170-180	0.1	0%

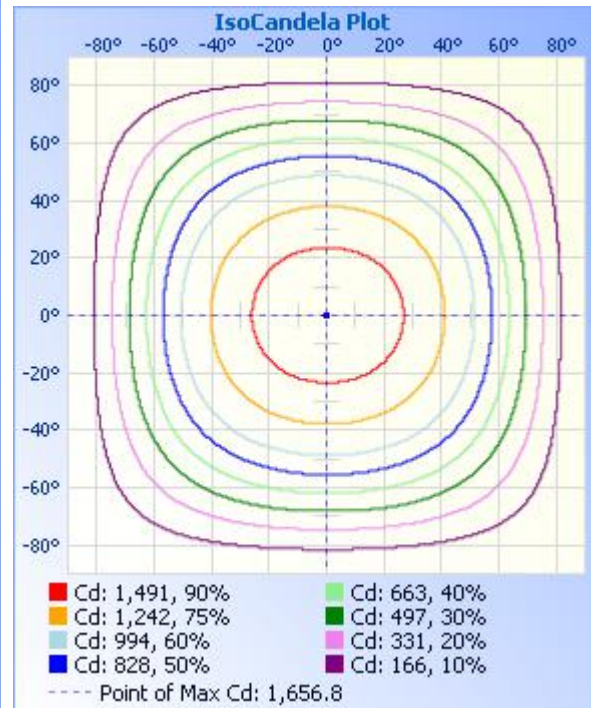
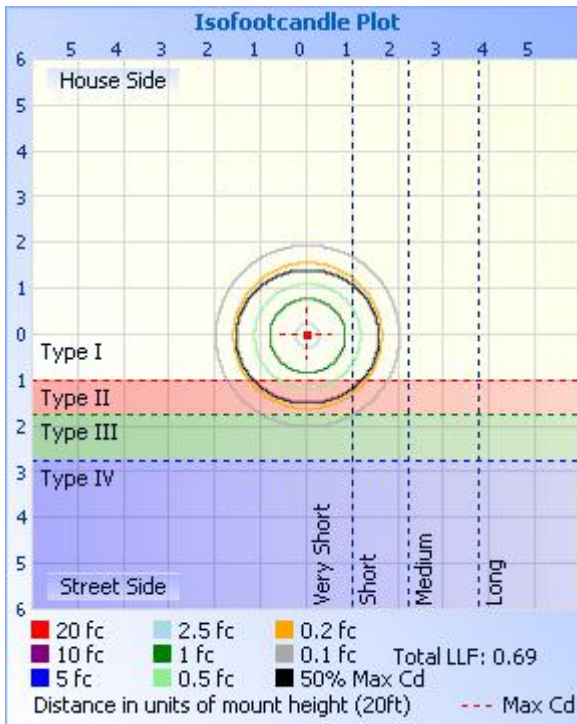
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	<b>5.73 fc</b>	<b>49.4 ft</b>	<b>53.1 ft</b>
34.0ft	<b>1.43 fc</b>	<b>98.7 ft</b>	<b>106.1 ft</b>
51.0ft	<b>0.64 fc</b>	<b>148.1 ft</b>	<b>159.2 ft</b>
68.0ft	<b>0.36 fc</b>	<b>197.4 ft</b>	<b>212.3 ft</b>
85.0ft	<b>0.23 fc</b>	<b>246.8 ft</b>	<b>265.4 ft</b>
102.0ft	<b>0.16 fc</b>	<b>296.2 ft</b>	<b>318.4 ft</b>

■ Vert. Spread: 110.9°  
 ■ Horiz. Spread: 114.7°



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Table--1 UNIT: cd

C (DEG) \ γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	1657	1657	1657	1657	1657	1657	1657	1657	1657	1657	1657	1657	1657	1657	1657	1657
5	1652	1652	1651	1651	1651	1651	1651	1651	1651	1650	1649	1649	1648	1648	1649	1651
10	1635	1634	1632	1630	1630	1630	1632	1634	1635	1632	1628	1625	1623	1624	1629	1633
15	1608	1606	1601	1595	1593	1595	1600	1605	1607	1602	1594	1587	1584	1583	1594	1603
20	1567	1564	1555	1546	1543	1546	1555	1562	1566	1558	1545	1534	1530	1534	1546	1559
25	1513	1508	1495	1482	1478	1482	1495	1506	1511	1500	1484	1468	1462	1468	1485	1502
30	1444	1437	1422	1406	1400	1405	1421	1436	1441	1428	1408	1389	1381	1388	1409	1431
35	1359	1352	1334	1316	1309	1315	1333	1351	1357	1343	1319	1297	1289	1297	1320	1345
40	1261	1254	1234	1215	1207	1215	1234	1253	1258	1243	1217	1194	1186	1194	1219	1245
45	1149	1143	1123	1103	1096	1103	1122	1141	1147	1131	1105	1083	1074	1082	1106	1133
50	1026	1021	1003	983	976	983	1002	1019	1023	1008	985	963	954	963	985	1010
55	894	890	875	856	850	857	874	888	892	877	856	836	829	837	856	879
60	755	753	740	726	720	726	740	751	754	741	723	707	701	708	724	742
65	614	613	603	592	589	593	603	612	613	601	587	575	571	576	588	603
70	472	471	465	460	457	460	467	473	472	461	451	444	441	444	453	464
75	331	332	331	329	328	330	334	336	334	326	319	315	313	316	321	326
80	198	200	203	204	204	205	207	205	202	197	195	193	191	193	195	196
85	79.3	80.5	82.8	87.3	88.5	89.0	86.5	85.1	83.2	79.0	77.0	77.9	77.1	77.1	76.1	77.4
90	0.04	0.09	0.11	0.27	0.16	0.18	0.12	0.15	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	0.00	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
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.25	0.30	0.05	0.00	0.20	0.15
110	0.30	0.10	0.00	0.15	0.10	0.00	0.00	0.15	0.26	0.41	0.46	0.31	0.25	0.10	0.25	0.46
115	0.51	0.41	0.30	0.10	0.30	0.10	0.31	0.46	0.61	0.56	0.51	0.10	0.46	0.05	0.25	0.56
120	0.46	0.46	0.30	0.15	0.41	0.10	0.46	0.56	0.71	0.66	0.51	0.56	0.56	0.46	0.20	0.56
125	0.51	0.56	0.41	0.61	0.76	0.56	0.46	0.61	0.71	0.66	0.46	0.61	0.86	0.66	0.15	0.51
130	0.61	0.56	0.41	0.61	0.76	0.56	0.51	0.76	0.71	0.66	0.30	0.61	0.86	0.66	0.15	0.56
135	0.71	0.56	0.36	0.61	0.76	0.61	0.41	0.76	0.71	0.66	0.15	0.61	0.86	0.56	0.00	0.46
140	0.71	0.56	0.05	0.61	0.91	0.61	0.10	0.76	0.71	0.66	0.00	0.61	0.71	0.56	0.00	0.46
145	0.71	0.61	0.00	0.61	0.72	0.61	0.00	0.66	0.71	0.66	0.00	0.61	0.81	0.71	0.00	0.46
150	0.71	0.46	0.00	0.61	0.76	0.56	0.00	0.56	0.66	0.66	0.05	0.51	0.86	0.71	0.05	0.41
155	0.56	0.30	0.00	0.61	0.76	0.51	0.00	0.46	0.56	0.66	0.16	0.41	0.71	0.71	0.26	0.15
160	0.41	0.25	0.00	0.61	0.76	0.41	0.00	0.41	0.61	0.66	0.36	0.41	0.71	0.71	0.41	0.15
165	0.41	0.25	0.00	0.51	0.76	0.31	0.00	0.46	0.76	0.71	0.46	0.41	0.71	0.71	0.46	0.31
170	0.71	0.30	0.15	0.66	0.76	0.46	0.15	0.41	0.76	0.71	0.51	0.46	0.96	1.17	0.56	0.36
175	0.66	0.41	0.30	0.71	1.12	0.46	0.40	0.51	0.66	0.66	0.41	0.41	0.81	1.26	0.51	0.41
180	0.66	0.41	0.30	0.71	1.12	0.46	0.30	0.61	0.66	0.66	0.41	0.30	0.71	1.07	0.46	0.25

**2.2 Electrical, Photometric and Chromaticity Measurements**  
*(Refer to Work Instruction QD25)*

<b>Test date</b>	2017-04-25	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	151054-105		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170404	120.0	60	0.3278	38.59	0.9810	11.93
1-J2	277.0	60	0.1491	37.99	0.9198	14.37
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

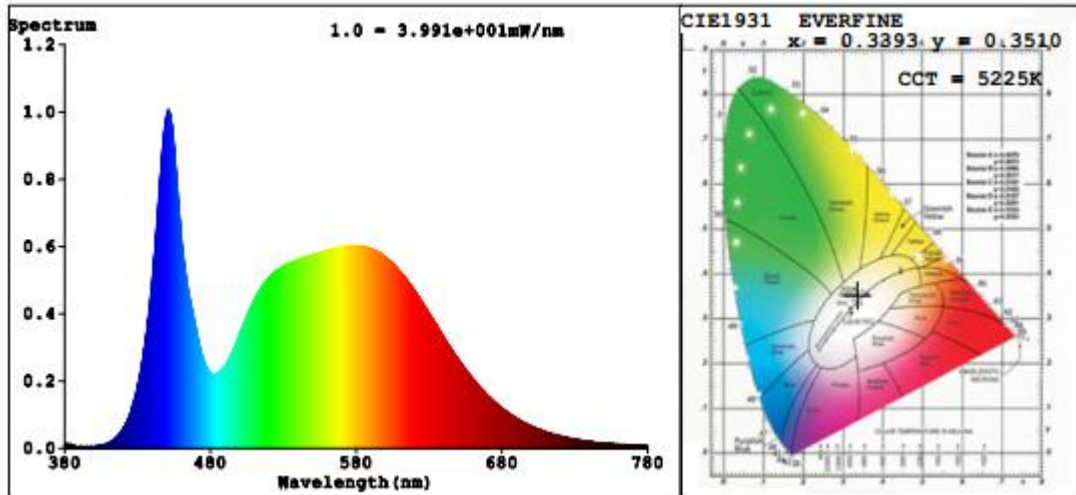
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	3
Frequency (Hz)	60	R2	86	R10	66
CCT (K)	5225	R3	90	R11	81
Duv	0.0021	R4	82	R12	59
Chromaticity (x, y)	x=0.3393 y=0.3510	R5	81	R13	81
Chromaticity (u', v')	u'=0.2077 v'=0.4835	R6	81	R14	94
Color Rendering Index (CRI)	81.5	R7	86	R15	75
R9	3	R8	67	--	--

**Photometric Measurement – Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	5000	4978	>=2000(-10%)	
Luminous Efficacy (lm/W)	129.57	131.04	Standard: >= 100(-3%)	Premium: >= 125(-3%)



**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)
151054-101	3000K	4787.9	37.92	126.26
151054-102	3500K	4841 <sup>*1</sup>	38.26 <sup>*2</sup>	126.53 <sup>*3</sup>
151054-103	4000K	4894 <sup>*1</sup>	38.26 <sup>*2</sup>	127.91 <sup>*3</sup>
151054-105	5000K	5000	38.59	129.57

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

$$4841 = (5000 - 4787.9) / 4 + 4787.9$$

$$4894 = (5000 - 4787.9) / 4 + 4841$$

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

$$38.26 = (37.92 + 38.59) / 2$$

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

$$126.53 = 4841 / 38.26$$

$$127.91 = 4894 / 38.26$$

**3. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-327	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-12	2017-07-11
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
GO-R5000	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-12	2017-07-11
PF210	Power Meter for Goniophotometer	2016-07-07	2017-07-06

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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