

**LM-79-08 Test Report**

For

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

2280 Ward Ave. Simi Valley CA. 93065

**2-lamp External Driver Lamp-Style Retrofit Kits**  
**(UL Type C)**

Model name(s): 205421-21X

Remark: The "X" stands for different CCT as bellow: 1=3000K,  
2=3500K, 3=4000K, 5=5000K.Representative (Tested) Model: 205421-211  
205421-215

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

Test &amp; Report By:

*Vicky Sun*

Engineer: Vicky Sun

Date: Jul.09,2018

Review By:

*John Li*

Manager: John Li

- Note: 1. The results contained in this report pertain only to the rested samples.  
2. 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

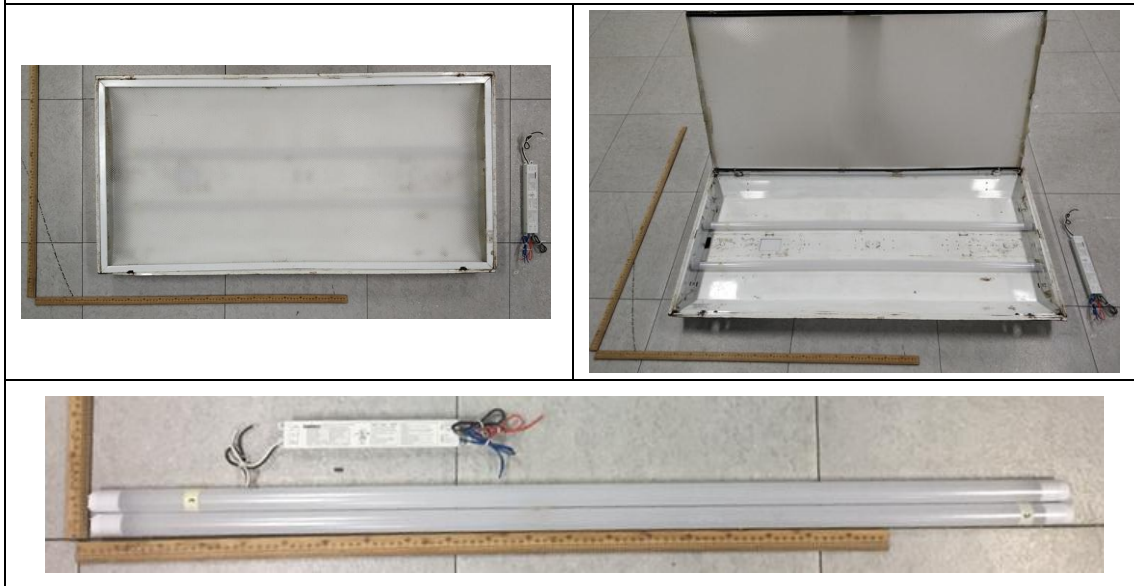
Fax: 8620-32290422

<http://www.standard-tech.com>

**1.1 Product Information:**

Organization Name	Revolution Lighting Technologies, Inc.	
Brand Name	Revolution Lighting Technologies	
Model Number	205421-21X	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	2-lamp External Driver Lamp-Style Retrofit Kits (UL Type C)	
Rated Voltage / Frequency	120-277 Vac, 50/60 Hz	
Nominal Power	15W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K, 3500K, 4000K, 5000K	
LED Manufacturer	EVERLIGHT ELECTRONICS CO., LTD	
LED Model	67-21S/KK5C-H3030N4P02430Z6/2T(HN), 67-21S/KK5C-H5050N42PA2430Z6/2T(HN)	
Test Ballast	N/A	
Sample Number	JBE180607-H1,H2(3000K), H3(5000K)	
Lamp Length	1200	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**



**1.2 Test Specifications:**

Date of Receipt	Jun.21, 2018
Date of Test	Jun.22, 2018
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>	2018-06-22	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	205421-211		

**Electrical Measurement for Bare-lamp:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180607-	120.0	60	0.1287	15.39	0.9968	3.49
H1	277.0	60	0.0598	15.68	0.9466	7.03
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

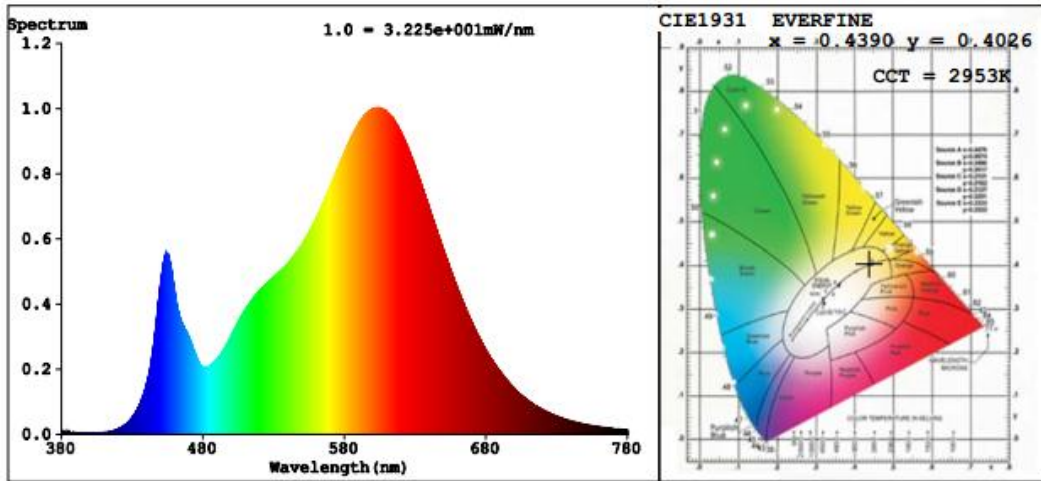
**Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	4
Frequency (Hz)	60	R2	92	R10	83
CCT (K)	2957	R3	94	R11	78
Duv	-0.0012	R4	79	R12	72
Chromaticity (x, y)	x=0.4383 y=0.4016	R5	81	R13	84
Chromaticity (u', v')	u'=0.2525 v'=0.5206	R6	91	R14	98
Color Rendering Index (CRI)	82.0	R7	81	R15	73
R9	4	R8	57	--	--

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

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2112	2126	Bare Lamp: 1600(-10%)
Luminous Efficacy (lm/W)	137.23	135.59	Bare lamp: >= 110(-3%)
Most Worst Luminous/Highest Watts	134.69		

**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>	2018-06-22	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	205421-211		

**Electrical Measurement for 2-lamp in Lithonia 2GT8 lensed 2x4:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180607-H1, H2	120.0	60	0.2551	30.47	0.9952	3.55
	277.0	60	0.1186	31.05	0.9451	7.22
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

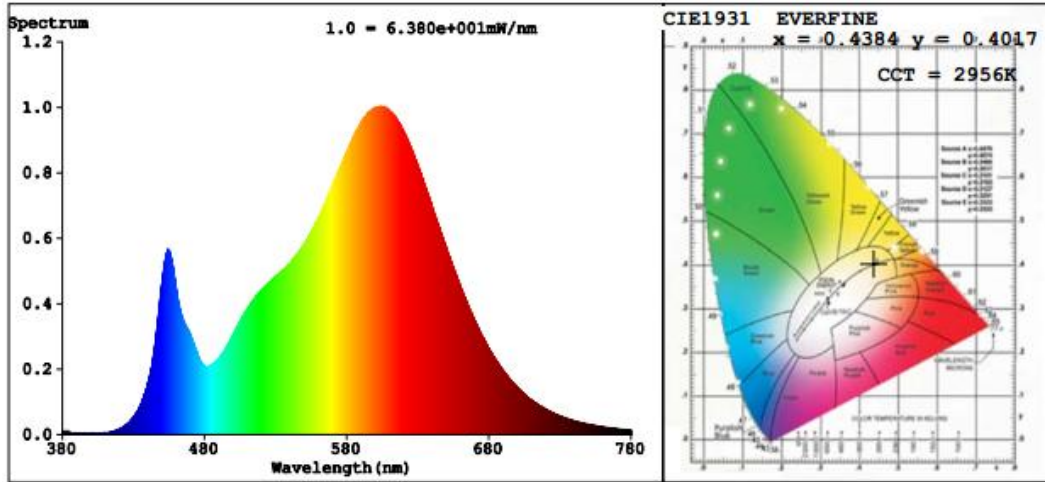
**Chromaticity Measurement for Lithonia 2GT8 lensed 2x4- Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	6
Frequency (Hz)	60	R2	93	R10	83
CCT (K)	2956	R3	94	R11	79
Duv	-0.0012	R4	79	R12	72
Chromaticity (x, y)	x=0.4384 y=0.4017	R5	82	R13	84
Chromaticity (u', v')	u'=0.2526 v'=0.5207	R6	91	R14	98
Color Rendering Index (CRI)	82.3	R7	81	R15	74
R9	6	R8	57	--	--

**Photometric Measurement 2-lamp in Lithonia 2GT8 lensed 2x4 – Goniophotometer Method:**

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3481.5	3504.9	In luminaire (2 lamps): 3000(-10%)
Luminous Efficacy (lm/W)	114.26	112.88	In luminaire: >= 100(-3%)
Most Worst Luminous/Highest Watts	112.13		
Zonal lumens in the 0-60 ° zone (%)	85	--	>= 75(-3)
SC: 0-180 °(if applicable)	1.25	--	1.0-2.0(±0.1)
SC: 90-270 °(if applicable)	1.35	--	1.0-2.0(±0.1)
Beam Angle ( °)	96.3	--	--
Center Beam Candle Power (cd)	1482	--	--

**Spectral Power Distribution & Chromaticity Diagram**



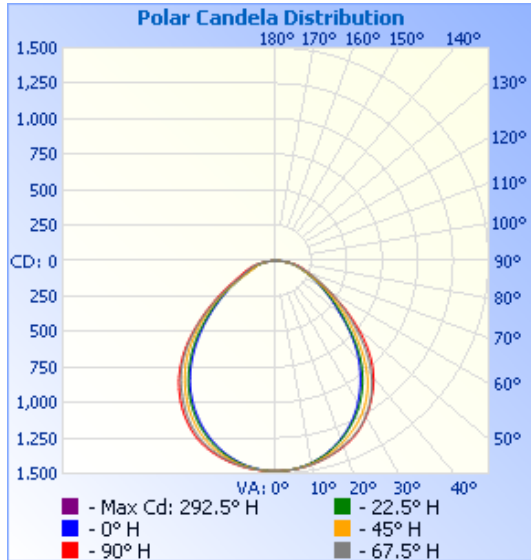
**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,139.8	32.7%
0-40	1,834.3	52.7%
0-60	2,960.4	85%
60-90	515.2	14.8%
70-100	226.9	6.5%
90-120	2.6	0.1%
0-90	3,475.5	99.8%
90-180	5.5	0.2%
0-180	3,481.0	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	140.2	4.0%	90-100	0.9	0%
10-20	400.0	11.5%	100-110	0.8	0%
20-30	599.6	17.2%	110-120	0.9	0%
30-40	694.5	19.9%	120-130	0.8	0%
40-50	647.5	18.6%	130-140	0.7	0%
50-60	478.6	13.7%	140-150	0.6	0%
60-70	289.2	8.3%	150-160	0.5	0%
70-80	169.0	4.9%	160-170	0.3	0%
80-90	56.9	1.6%	170-180	0.1	0%



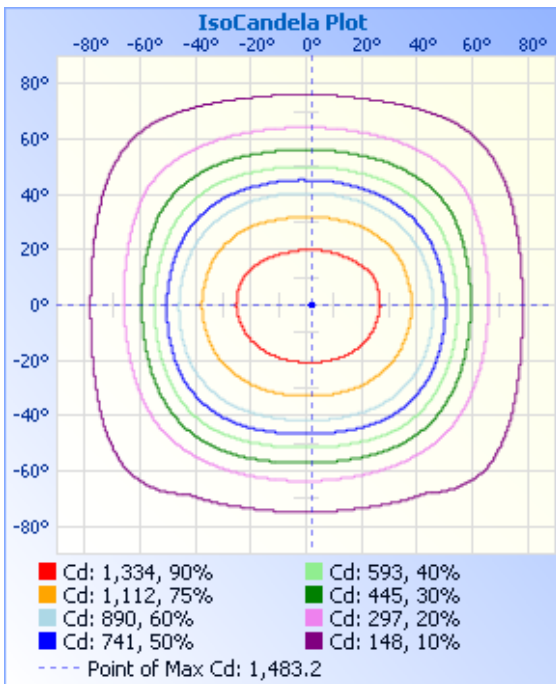
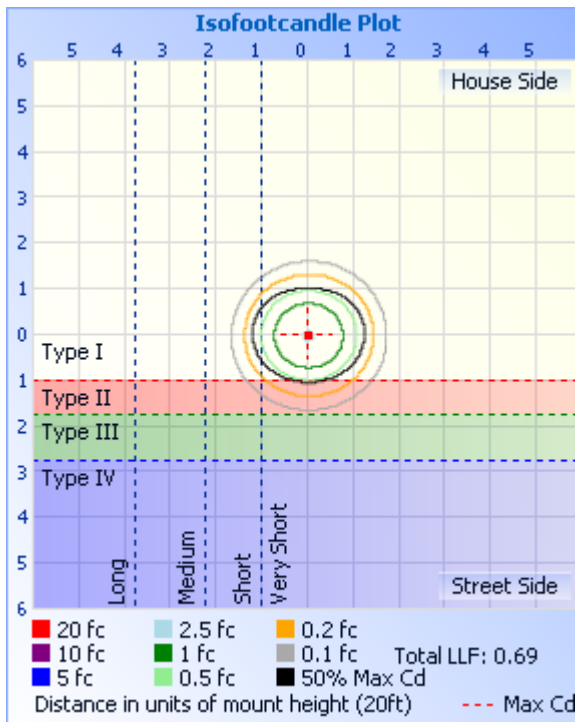
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	5.13 fc	35.1 ft	41.2 ft
34.0ft	1.28 fc	70.2 ft	82.3 ft
51.0ft	0.57 fc	105.3 ft	123.5 ft
68.0ft	0.32 fc	140.4 ft	164.6 ft
85.0ft	0.21 fc	175.4 ft	205.8 ft
102.0ft	0.14 fc	210.5 ft	247.0 ft

■ Vert. Spread: 91.8°  
 ■ Horiz. Spread: 100.9°



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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	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482	1482
5	1480	1482	1477	1476	1474	1474	1475	1476	1475	1473	1473	1473	1473	1475	1477	1478
10	1466	1469	1457	1452	1447	1447	1453	1457	1458	1452	1448	1446	1445	1450	1457	1463
15	1443	1444	1420	1409	1400	1403	1416	1429	1430	1420	1411	1402	1399	1408	1422	1436
20	1407	1406	1369	1349	1337	1343	1366	1389	1394	1380	1362	1343	1337	1349	1372	1395
25	1354	1352	1305	1273	1256	1267	1303	1338	1344	1324	1297	1269	1259	1275	1305	1336
30	1275	1272	1223	1180	1157	1175	1227	1265	1271	1246	1213	1177	1164	1182	1217	1252
35	1177	1167	1114	1066	1039	1065	1125	1169	1177	1151	1110	1069	1052	1072	1111	1150
40	1060	1032	973	929	909	935	992	1048	1072	1048	997	942	920	942	993	1038
45	914	874	808	766	763	777	832	899	936	920	864	803	774	799	852	896
50	743	711	653	615	605	625	679	736	771	762	711	651	624	644	693	732
55	572	559	516	484	479	494	534	581	597	588	558	509	483	498	535	557
60	421	428	394	377	374	382	407	446	439	422	399	377	364	364	379	398
65	306	318	293	288	290	292	302	333	318	288	260	258	264	251	248	274
70	233	229	212	215	221	218	220	242	241	214	178	185	194	182	173	209
75	180	163	156	158	166	162	161	173	185	171	144	142	145	141	142	167
80	123	111	105	106	114	110	111	118	128	124	110	101	102	98.7	107	121
85	48.2	52.4	49.1	54.4	57.7	58.7	52.7	57.8	52.3	55.1	50.3	50.5	50.7	48.6	48.2	50.5
90	1.10	0.93	1.18	1.75	1.66	1.95	1.32	1.11	6.07	0.42	0.79	1.02	0.96	0.90	1.05	0.36
95	0.36	0.55	0.76	1.05	1.17	1.03	0.66	0.43	1.12	0.34	0.66	0.99	0.80	0.86	0.60	0.34
100	0.39	0.56	0.67	1.02	1.06	0.96	0.62	0.38	0.49	0.49	0.73	0.88	0.60	0.86	0.72	0.42
105	0.41	0.68	0.84	1.08	1.02	0.96	0.66	0.31	0.79	0.69	0.85	0.78	0.53	0.88	0.86	0.63
110	0.67	1.03	0.92	1.08	0.98	0.96	0.85	0.40	0.97	0.79	1.10	0.69	0.48	0.78	0.91	0.79
115	0.91	1.08	0.99	1.08	0.94	0.96	0.96	0.84	1.01	1.03	1.11	0.63	0.46	0.50	0.95	0.80
120	0.96	1.09	0.98	0.91	0.90	0.82	0.96	1.10	1.03	1.06	1.13	0.58	0.44	0.45	0.93	0.86
125	0.99	1.09	0.98	0.84	0.85	0.78	0.94	1.13	1.09	1.08	1.11	0.58	0.54	0.48	0.89	0.91
130	1.01	1.09	0.97	0.87	0.84	0.78	0.92	1.10	1.09	1.07	0.95	0.66	0.60	0.54	0.83	0.97
135	1.03	1.10	0.97	0.90	0.91	0.78	0.90	1.03	1.09	1.06	0.86	0.71	0.72	0.66	0.76	1.01
140	1.06	1.10	0.79	0.96	0.99	0.83	0.74	0.99	1.09	1.05	0.79	0.87	0.88	0.92	0.68	0.85
145	1.08	1.10	0.76	0.96	1.06	0.90	0.60	0.91	1.09	1.05	0.79	0.98	1.04	1.00	0.78	0.87
150	1.09	1.10	0.73	1.00	1.08	0.90	0.60	0.77	1.09	1.04	0.81	1.08	1.15	1.16	0.98	0.87
155	1.09	1.02	0.80	1.03	1.08	0.90	0.72	0.69	1.09	1.05	0.85	1.11	1.18	1.18	0.97	0.90
160	1.09	0.96	0.84	1.04	1.08	0.92	0.79	0.67	1.09	1.08	0.88	1.13	1.19	1.17	0.98	0.94
165	1.07	0.94	0.87	1.06	1.08	0.96	0.87	0.67	1.09	1.10	0.89	1.16	1.19	1.15	1.00	0.97
170	1.05	0.93	0.89	1.07	1.08	1.00	0.95	0.85	1.09	1.13	0.90	1.18	1.20	1.14	1.01	1.00
175	1.04	0.92	0.94	1.08	1.14	1.02	1.01	0.85	1.09	1.15	0.90	1.14	1.11	1.14	1.02	1.03
180	1.03	0.91	0.91	1.08	1.14	1.02	0.96	0.67	1.03	1.03	0.91	0.96	1.08	1.14	1.02	0.97

**2.3 Electrical, Photometric and Chromaticity Measurements**

(Refer to Work Instruction QD25)

<b>Test date</b>	2018-05-28	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	205421-215		

**Electrical Measurement for Bare-lamp:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180607-H3	120.0	60	0.1283	15.35	0.9968	3.50
	277.0	60	0.0597	15.64	0.9462	7.11
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

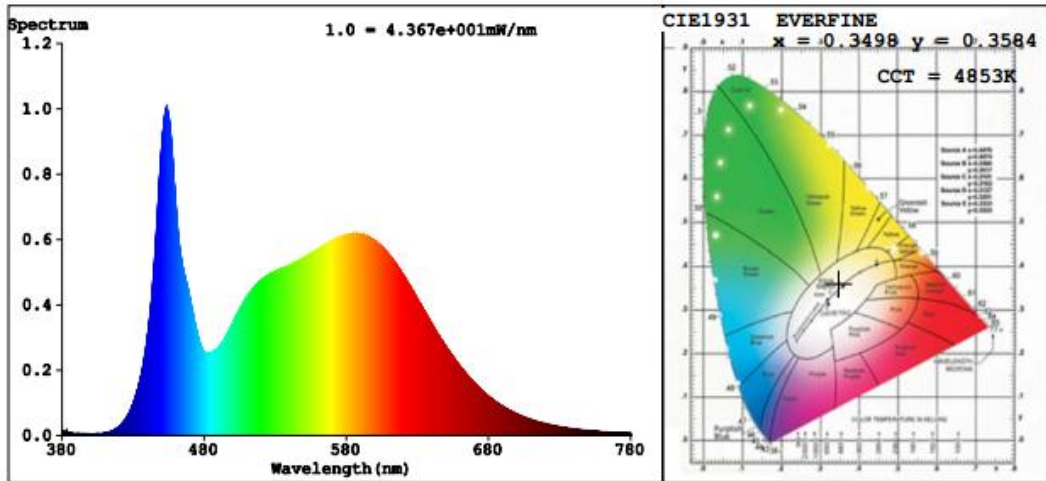
**Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	5
Frequency (Hz)	60	R2	90	R10	75
CCT (K)	4856	R3	95	R11	79
Duv	0.0016	R4	80	R12	56
Chromaticity (x, y)	x=0.3497 y=0.3584	R5	81	R13	84
Chromaticity (u', v')	u'=0.2119 v'=0.4886	R6	85	R14	98
Color Rendering Index (CRI)	82.7	R7	86	R15	75
R9	5	R8	65	--	--

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

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	2226	2241	Bare Lamp: 1600(-10%)
Luminous Efficacy (lm/W)	145.02	143.29	Bare lamp: >= 110(-3%)
Most Worst Luminous/Highest Watts	142.33		

**Spectral Power Distribution & Chromaticity Diagram**



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**2.4 Performance Assessment:**

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
205421-211	3000K	2112	15.39	137.23
205421-212	3500K	2141 <sup>*1</sup>	15.37 <sup>*2</sup>	139.26 <sup>*3</sup>
205421-213	4000K	2169 <sup>*1</sup>	15.37 <sup>*2</sup>	141.12 <sup>*3</sup>
205421-215	5000K	2226	15.35	145.02

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

$$2141=(2226-2112)/4*1+2112$$

$$2169=(2226-2112)/4*2+2112$$

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

$$15.37=(15.39+15.35)/2$$

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

$$139.26=2141/15.37$$

$$141.12=2169/15.37$$

**3. Test Equipment**

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2018-07-01	2019-06-30
ST-R-327	Spectral analysis system HAAS-2000	2018-07-01	2019-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2018-07-01	2019-06-30
GO-R5000	Goniophotometer system	2018-07-01	2019-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2018-07-07	2019-07-06
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 \*\*\*\*\***