

## LM-79-08 Test Report

For

### Revolution Lighting Technologies, Inc.

(Brand Name:  Revolution Lighting )

2280 Ward Ave. Simi Valley, CA. 93065

## Outdoor Pole/Arm-Mounted Area and Roadway Luminaires

Model name(s): 113XS1-3LT

Remark: 113 represents Area Light Type, X represents Standard Housing Color. S represents Sensor Options, can be 1=N/A; 2=photocell& motion sensor. 1 represents 75W(AC100-277V). L represents Lens Type, can be 3=TYPEIII, 5=TYPEV. T represents CCT, can be 2=4000K,4=5000K. This is a multiple list report, the original report NO. is GZE1708002-A-R.

Representative (Tested) Model: 113021-332 [113011-332]  
113021-334 [113011-334]

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

Test &amp; Report By:

*Jack Luo*

Engineer: Jack Luo

Date: Aug.11,2017

Update: Nov.13,2017(Updating model numbers)

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Review By:

*Tommy Liang*

Manager: Tommy Liang


Laboratory: Standard-Tech Co. Ltd Testing Center  
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

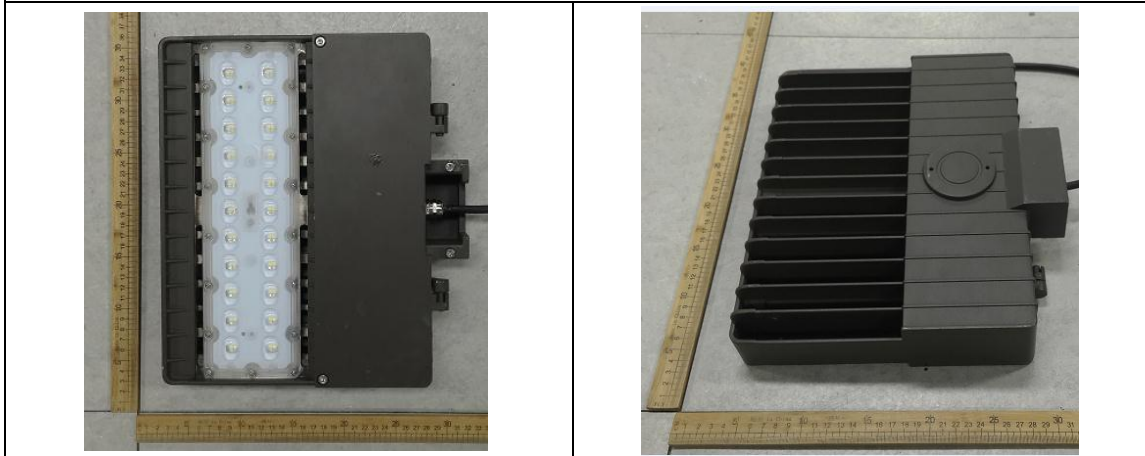
Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

**1.1 Product Information:**

Organization Name	Revolution Lighting Technologies, Inc.	
Brand Name		
Model Number	113XS1-3LT	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
Rated Voltage / Frequency	100-277 Vac, 50/60 Hz	
Nominal Power	75W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Lumileds	
LED Model	L130-3080003000W2C	
Sample Number	GZE1708002-A1(4000K),A2(5000K)	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**



**1.2 Test Specifications:**

Date of Receipt	Aug.04,2017
Date of Test	Aug.05,2017
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>	2017-08-05	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	113021-332 [113011-332]		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170800	120.0	60	0.6285	74.72	0.9907	8.70
2-A1	277.0	60	0.2848	74.12	0.9395	13.1
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

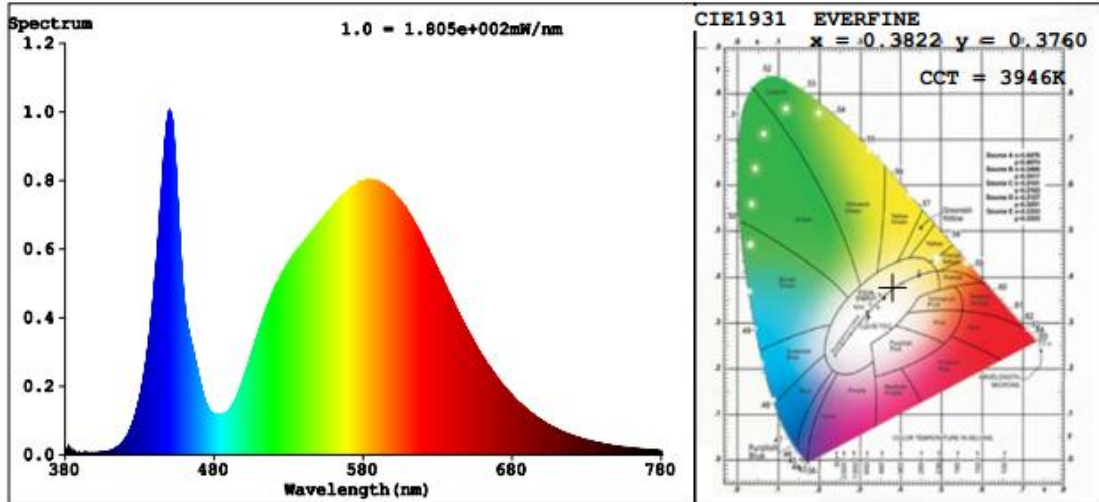
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	72	R9	0
Frequency (Hz)	60	R2	81	R10	53
CCT (K)	3946	R3	87	R11	68
Duv	-0.0009	R4	73	R12	43
Chromaticity (x, y)	x=0.3822 y=0.3760	R5	71	R13	73
Chromaticity (u', v')	u'=0.2266 v'=0.5015	R6	72	R14	92
Color Rendering Index (CRI)	74.1	R7	82	R15	67
R9	0	R8	56	--	--

**Photometric Measurement –Goniophotometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	9157.6	9103.7	≥1000 (-10%)	
Luminous Efficacy (lm/W)	122.56	122.82	Standard: ≥100(-3%)	Premium: ≥120(-3%)
Most Worst Luminous/Highest Watts	121.84			
Zonal lumens in the 0-90 °zone (%)	99.8	--	≥ 100(-1)	
Zonal lumens in the 80-90 °zone (%)	1.3	--	≤ 10(+3)	
Beam Angle (°)	132.2	--	--	
Center Beam Candle Power (cd)	2101	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

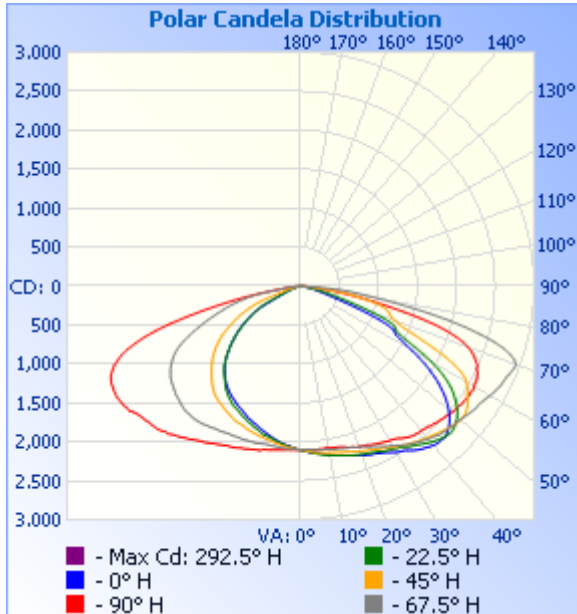


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,788.5	19.5%
0-40	3,164.1	34.6%
0-60	6,657.5	72.7%
60-90	2,481.6	27.1%
70-100	968.3	10.6%
90-120	6.7	0.1%
0-90	9,139.1	99.8%
90-180	18.1	0.2%
0-180	9,157.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	200.6	2.2%	90-100	1.4	0%
10-20	598.2	6.5%	100-110	2.3	0%
20-30	989.7	10.8%	110-120	3.0	0%
30-40	1,375.7	15.0%	120-130	3.3	0%
40-50	1,696.2	18.5%	130-140	2.9	0%
50-60	1,797.2	19.6%	140-150	2.3	0%
60-70	1,514.7	16.5%	150-160	1.6	0%
70-80	844.8	9.2%	160-170	1.0	0%
80-90	122.1	1.3%	170-180	0.4	0%

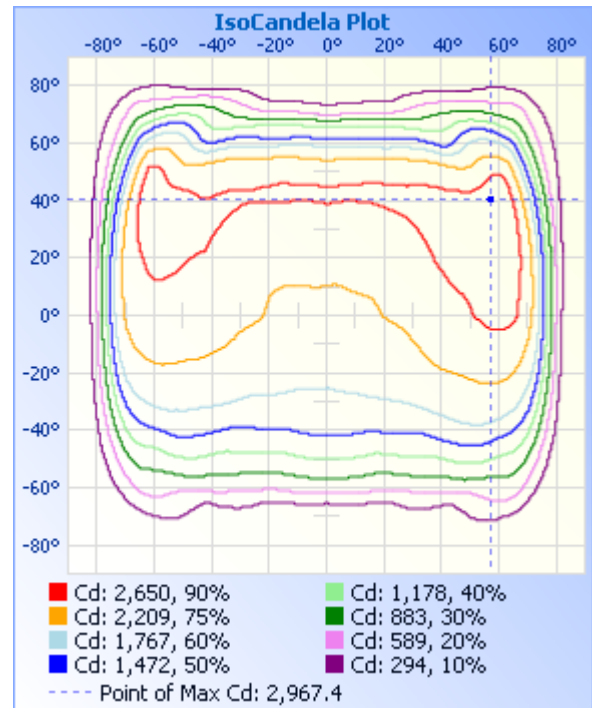
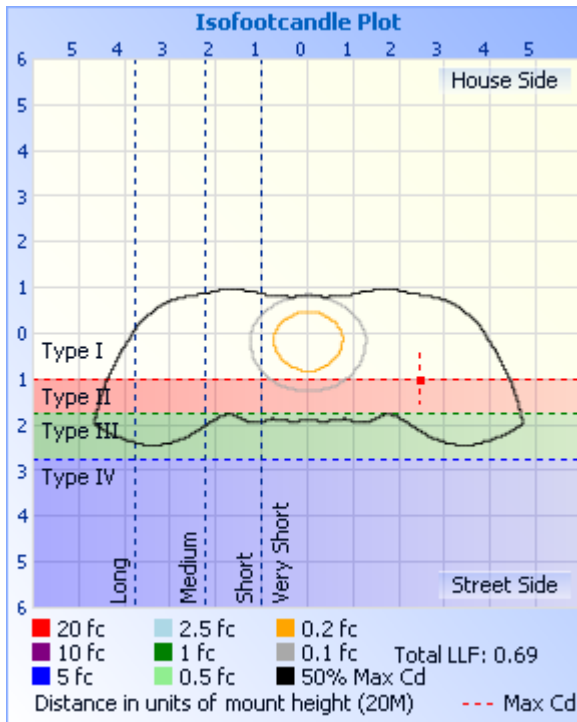
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
20.0M	0.49 fc	54.5 M	129.7 M
40.0M	0.12 fc	109.0 M	259.3 M
60.0M	0.05 fc	163.4 M	389.0 M
80.0M	0.03 fc	217.9 M	518.7 M
100.0M	0.02 fc	272.4 M	648.3 M

■ Vert. Spread: 107.4°  
 ■ Horiz. Spread: 145.7°



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Table--1

UNIT: cd

C (DEG) y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	2101	2101	2101	2101	2101	2101	2101	2101	2101	2101	2101	2101	2101	2101	2101	2101
5	2109	2140	2149	2149	2145	2156	2142	2110	2107	2058	2057	2042	2050	2058	2068	2095
10	2136	2162	2197	2190	2201	2207	2171	2128	2109	2037	2014	1993	1984	1998	2030	2083
15	2175	2201	2231	2236	2248	2252	2204	2153	2137	2033	1998	1930	1912	1952	1997	2088
20	2213	2250	2271	2274	2310	2297	2254	2196	2191	2057	1958	1857	1837	1881	1962	2098
25	2256	2328	2332	2331	2367	2342	2310	2270	2239	2080	1908	1792	1765	1813	1926	2108
30	2326	2411	2431	2400	2464	2409	2387	2365	2289	2076	1849	1718	1695	1751	1872	2128
35	2405	2514	2509	2497	2569	2505	2461	2470	2371	2093	1780	1631	1620	1654	1818	2167
40	2501	2618	2595	2611	2662	2611	2537	2558	2418	2093	1672	1509	1511	1520	1743	2181
45	2598	2721	2685	2686	2663	2689	2614	2628	2475	2067	1554	1345	1366	1373	1617	2161
50	2640	2734	2725	2621	2488	2624	2672	2673	2522	1975	1404	1153	1171	1170	1483	2109
55	2725	2780	2663	2370	2163	2398	2623	2740	2565	1876	1236	934	953	942	1313	2041
60	2753	2846	2456	1865	1656	1944	2461	2812	2576	1737	1035	680	710	697	1085	1906
65	2690	2933	1745	1375	1307	1360	1896	2879	2497	1498	804	358	295	378	824	1653
70	2367	2862	1255	904	600	984	1286	2945	2289	1144	448	159	154	163	475	1266
75	1514	2091	1041	351	228	382	1136	2393	1596	825	154	84.3	73.4	85.5	159	910
80	523	1058	512	111	71.1	121	684	1227	631	371	53.6	12.3	7.36	13.3	55.7	416
85	96.6	417	19.0	2.56	1.89	2.60	34.2	481	119	72.3	9.32	4.80	3.18	5.49	11.8	68.1
90	3.55	3.60	0.92	0.01	0.00	0.01	1.16	3.91	2.90	2.44	2.34	0.00	0.00	0.00	0.85	3.14
95	3.53	1.89	0.05	0.00	0.00	0.00	0.00	2.15	3.07	2.88	0.66	0.00	0.00	0.00	1.22	3.49
100	3.99	1.84	0.00	0.00	0.00	0.00	0.00	1.94	3.75	3.79	1.82	0.86	0.20	0.71	1.91	4.24
105	5.09	2.33	0.25	0.00	0.00	0.00	0.30	2.39	4.90	5.12	2.72	1.41	0.92	1.37	2.81	5.03
110	6.04	3.23	0.60	0.00	0.00	0.00	0.90	3.24	5.27	5.57	3.48	2.17	1.78	2.08	3.42	5.38
115	6.25	3.73	1.21	0.15	0.30	0.00	1.25	4.03	5.32	5.68	4.18	2.64	2.89	2.69	3.53	5.33
120	6.22	4.03	1.91	0.60	0.61	0.71	1.85	4.31	5.10	5.62	4.11	3.58	3.45	3.45	3.60	4.68
125	6.19	4.32	2.02	1.36	1.57	1.51	2.04	4.54	4.89	5.42	4.00	4.33	4.30	4.11	3.50	4.41
130	6.15	4.33	2.13	1.86	1.98	2.03	2.25	4.54	4.64	4.37	4.11	4.44	4.45	4.48	3.68	3.64
135	5.60	3.98	2.21	2.87	3.38	2.89	2.59	3.99	4.24	4.10	3.92	4.46	4.60	4.46	3.45	3.62
140	5.10	3.78	2.39	3.26	4.30	3.29	2.55	3.79	3.97	3.93	3.32	4.48	4.48	4.23	3.08	3.53
145	4.80	2.98	2.77	3.63	4.52	3.56	2.20	3.38	3.75	3.58	3.32	4.00	4.05	4.01	3.41	3.43
150	4.45	2.88	3.37	3.77	4.74	3.73	2.70	3.35	3.60	3.58	3.48	3.82	4.06	3.97	3.72	3.19
155	3.50	2.88	3.70	3.68	4.65	3.69	2.95	3.33	3.05	3.58	3.37	3.56	3.63	3.65	3.45	3.19
160	3.48	2.91	3.79	3.60	4.11	3.68	3.20	3.30	2.95	3.28	3.05	3.47	3.58	3.40	3.42	3.19
165	3.46	2.99	3.84	3.51	4.03	3.75	3.20	3.08	3.36	3.18	3.02	3.42	3.53	3.60	3.40	3.24
170	3.54	3.18	4.22	3.87	4.05	3.85	3.70	3.05	3.58	3.58	3.43	4.02	4.19	4.16	4.20	4.04
175	3.65	3.58	4.48	4.02	4.46	4.05	3.95	3.14	3.76	3.58	3.72	4.53	4.41	4.54	4.17	4.28
180	3.20	3.63	4.43	4.07	4.56	4.05	4.01	3.24	3.45	3.33	3.67	4.28	4.11	4.46	4.00	4.03

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

<b>Test date</b>	2017-08-05	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	Horizontal	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	113021-334 [113011-334]		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170800	120.0	60	0.6275	74.55	0.9901	8.84
2-A2	277.0	60	0.2846	73.97	0.9382	13.45
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

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

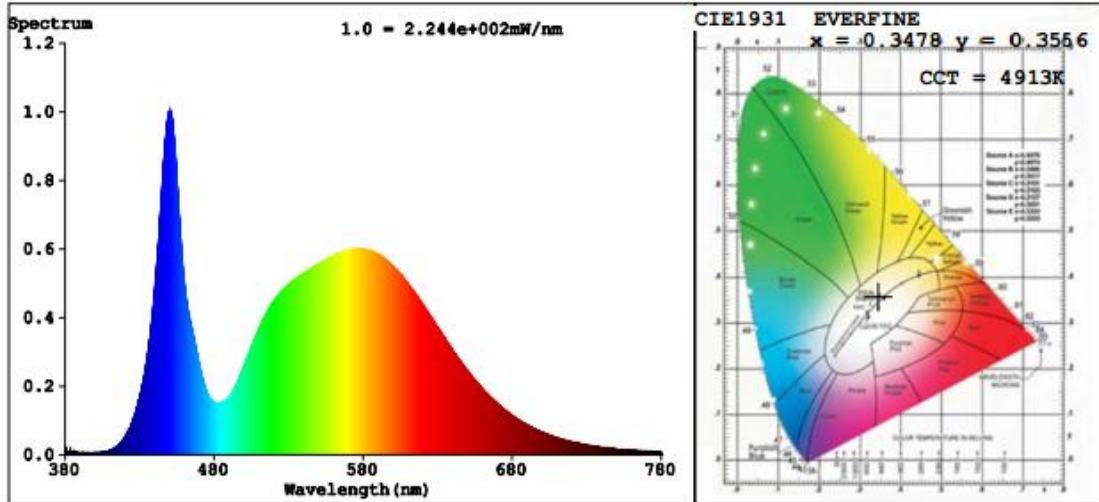
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	74	R9	0
Frequency (Hz)	60	R2	82	R10	56
CCT (K)	4913	R3	87	R11	73
Duv	0.0009	R4	76	R12	46
Chromaticity (x, y)	x=0.3478 y=0.3556	R5	74	R13	76
Chromaticity (u', v')	u'=0.2117 v'=0.4870	R6	74	R14	93
Color Rendering Index (CRI)	76.7	R7	85	R15	69
R9	0	R8	61	--	--

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

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	9333	9297	≥1000 (-10%)	
Luminous Efficacy (lm/W)	125.19	125.69	Standard: ≥=	Premium: ≥=
Most Worst Luminous/Highest Watts	124.71		100(-3%)	120(-3%)



**Spectral Power Distribution & Chromaticity Diagram**



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**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 \*\*\*\*\***