


1.1 Product Information:

Organization Name	□	
Brand Name		
Model Number	□	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Direct Linear Ambient Luminaires	
Rated Voltage / Frequency	120Vac, 50/60 Hz	
Nominal Power	10W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K	
LED Manufacturer	ShenZhen JuFei Optoelectronics Co., Ltd.	
LED Model	2835 White SMD LED	
Sample Number	GZE1712020-A1(3000K),A2(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	Dec.24,2017
Date of Test	Dec.26,2017
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, 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 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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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 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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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)

Test date	2017-12-26	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	870XX10W_30K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171202 0-A1	120.0	60	0.0786	9.195	0.9752	15.66
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

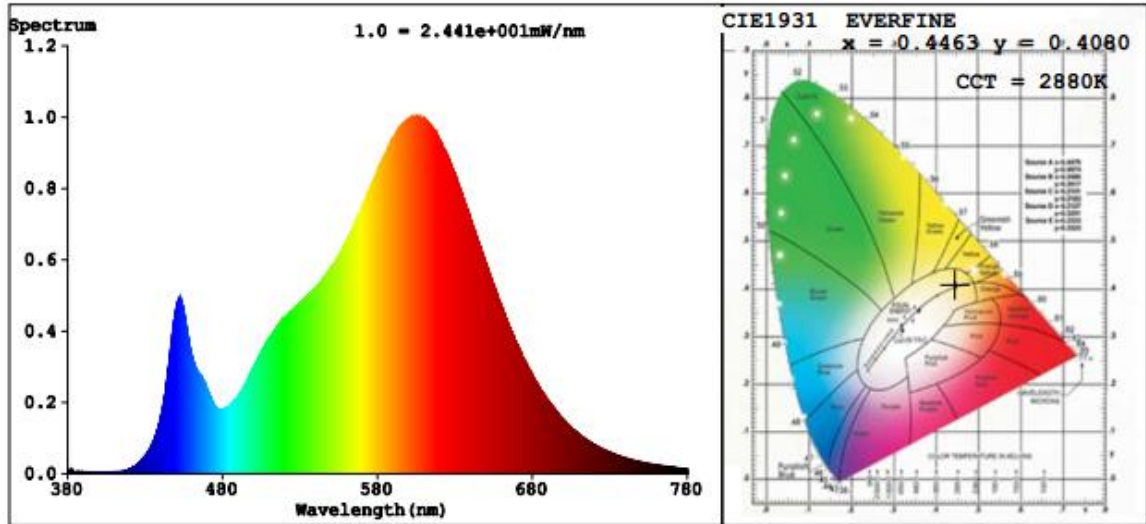
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	7
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	2880	R3	96	R11	80
Duv	0.0004	R4	80	R12	72
Chromaticity (x, y)	x=0.4463 y=0.4080	R5	81	R13	84
Chromaticity (u', v')	u'=0.2549 v'=0.5243	R6	90	R14	98
Color Rendering Index (CRI)	82.6	R7	82	R15	73
R9	7	R8	58	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	--	
Frequency (Hz)	60		
Total Luminous (lm)	1248.0	--	
Total Luminous (lm)/Total Length(ft)	634.0	$\geq 375\text{lm/ft}(-10\%)$	
Luminous Efficacy (lm/W)	135.73	Standard: $\geq 105(-3\%)$	Premium: $\geq 130(-3\%)$
Zonal lumens in the 0-60 ° zone (%)	51.5	$\geq 40(-3)$	
Beam Angle (°)	144.1	--	
Center Beam Candle Power (cd)	260	--	

Spectral Power Distribution & Chromaticity Diagram

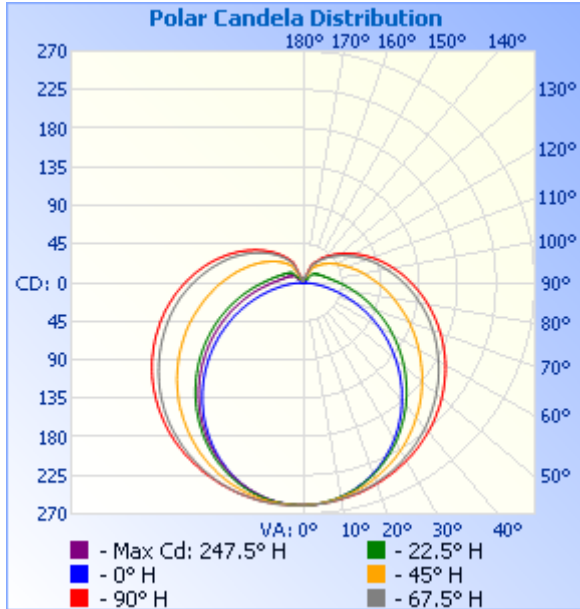


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	205.4	16.5%
0-40	342.1	27.4%
0-60	642.3	51.5%
60-90	353.6	28.3%
70-100	291.7	23.4%
90-120	181.6	14.6%
0-90	995.9	79.8%
90-180	252.1	20.2%
0-180	1,247.9	100%

Lumens Per Zone					
Zone	Lumens	%Total	Zone	Lumens	%Total
0-10	24.6	2.0%	90-100	76.5	6.1%
10-20	71.1	5.7%	100-110	59.9	4.8%
20-30	109.7	8.8%	110-120	45.2	3.6%
30-40	136.7	11.0%	120-130	32.3	2.6%
40-50	150.1	12.0%	130-140	20.7	1.7%
50-60	150.1	12.0%	140-150	11.9	1%
60-70	138.4	11.1%	150-160	4.2	0.3%
70-80	118.9	9.5%	160-170	1.1	0.1%
80-90	96.3	7.7%	170-180	0.3	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
3.33M	2.17 fc	9.32 M	7.04 M
6.67M	0.54 fc	18.62 M	14.07 M
10.00M	0.24 fc	27.94 M	21.11 M
13.33M	0.14 fc	37.25 M	28.14 M
16.67M	0.09 fc	46.56 M	35.18 M
20.00M	0.06 fc	55.88 M	42.22 M

■ Vert. Spread: 108.8°
■ Horiz. Spread: 93.1°

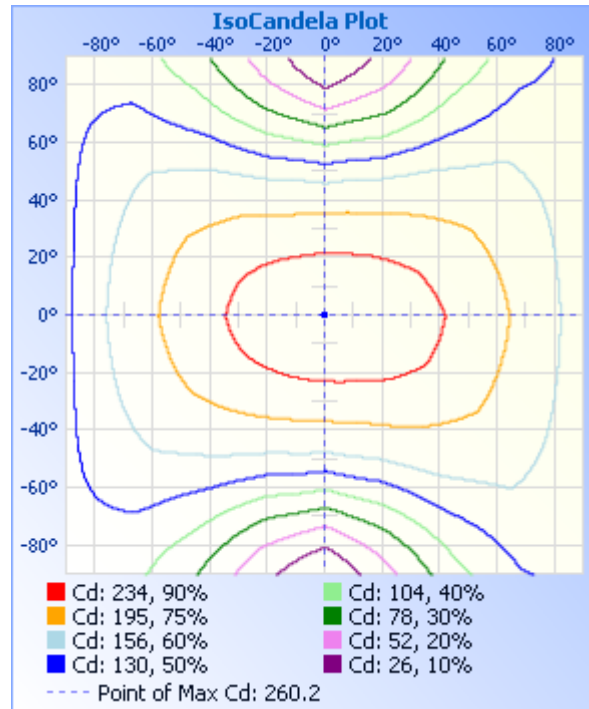
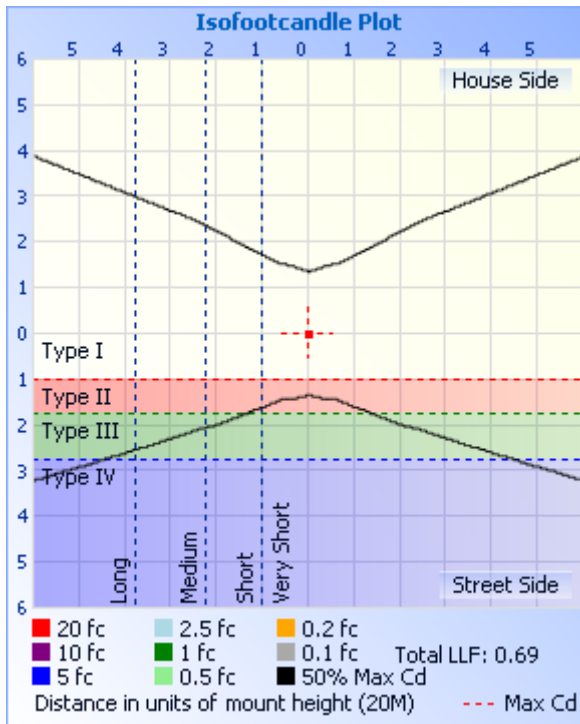


Table--1

UNIT: cd

C (DEG) \ Y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	
0	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	
5	259	259	259	259	258	258	258	259	259	259	259	259	259	259	259	260	
10	259	258	257	255	254	254	255	256	256	257	255	255	255	256	257	259	
15	258	256	252	248	247	247	250	253	254	253	250	248	249	250	254	257	
20	255	252	246	240	237	238	243	249	250	248	244	240	239	242	249	254	
25	252	248	238	229	225	228	235	243	245	243	235	230	228	232	242	250	
30	247	241	229	218	212	215	227	236	240	236	226	217	214	221	234	245	
35	242	234	219	204	196	201	216	229	234	228	215	203	199	207	225	238	
40	236	227	207	188	179	186	205	221	227	219	203	188	183	193	214	231	
45	229	218	195	172	161	170	193	212	219	210	191	172	165	178	203	224	
50	221	208	182	154	141	154	181	202	210	200	178	155	145	162	191	215	
55	213	198	169	137	121	137	168	193	201	189	164	137	126	145	179	205	
60	203	188	156	119	101	120	155	182	191	178	151	119	105	128	166	194	
65	193	177	143	101	80.2	104	143	171	181	167	137	101	84.8	112	154	183	
70	183	166	130	84.6	59.8	88.8	131	161	170	156	124	84.6	64.4	96.2	141	173	
75	172	155	117	69.0	40.6	74.7	118	150	159	145	112	68.8	44.7	81.5	128	162	
80	160	143	106	55.4	23.6	61.7	107	138	148	133	99.9	54.9	27.0	68.0	117	151	
85	149	132	94.7	44.0	10.2	50.9	96.7	127	137	122	88.7	42.7	12.6	56.5	106	139	
90	138	120	84.5	35.7	2.60	42.1	86.6	117	126	111	78.7	33.7	3.01	46.9	95.3	128	
95	126	111	75.7	29.2	1.67	35.1	77.3	107	115	101	69.4	26.7	1.57	39.6	85.5	117	
100	115	101	67.3	25.0	1.67	30.2	69.2	96.8	105	91.9	61.0	22.4	1.57	34.3	76.9	106	
105	105	91.2	62.4	21.8	1.82	26.5	61.5	87.7	95.1	82.2	54.6	19.6	1.72	29.9	68.7	96.6	
110	94.4	81.6	53.9	19.6	1.98	23.6	55.0	78.8	85.4	73.0	48.3	17.5	1.82	26.4	61.7	87.1	
115	84.5	72.8	48.1	18.0	1.98	21.4	49.2	70.5	76.3	65.5	43.1	16.2	1.82	23.9	55.1	77.8	
120	75.2	65.2	42.9	15.3	1.88	19.5	43.8	62.5	67.7	58.6	38.4	14.5	1.88	21.9	48.8	68.8	
125	66.6	57.7	38.3	14.8	1.77	17.8	39.0	55.1	59.7	51.9	34.2	13.6	1.93	20.0	43.1	60.8	
130	58.2	50.7	34.0	6.73	1.67	16.0	34.3	48.4	52.2	45.5	30.4	7.99	1.93	18.3	38.1	53.4	
135	50.4	44.2	29.3	5.73	1.67	7.00	30.3	42.1	45.2	39.8	26.3	7.02	1.93	8.82	33.4	46.6	
140	43.4	38.3	25.5	4.97	1.62	6.06	25.9	36.2	39.0	34.6	23.6	6.08	2.03	6.81	28.9	39.9	
145	36.8	32.1	21.8	4.18	1.52	5.30	22.5	29.8	32.9	28.7	21.0	5.48	2.03	4.94	24.4	33.7	
150	30.7	27.5	6.67	3.32	1.52	4.80	8.46	25.8	27.4	25.1	9.60	5.07	2.03	3.63	7.40	27.7	
155	22.9	8.93	5.70	2.77	1.52	4.34	7.00	12.6	21.6	17.0	7.15	4.82	2.13	4.13	5.56	8.35	
160	7.23	6.55	3.33	3.52	1.57	4.43	5.93	7.24	7.16	7.15	6.30	4.37	2.38	2.07	3.63	5.22	
165	5.21	3.71	2.57	2.62	1.47	4.04	4.60	5.63	5.41	5.38	4.99	3.92	2.38	2.07	3.93	3.58	
170	3.66	2.03	3.58	2.16	1.77	2.73	4.60	4.20	3.97	4.07	4.54	3.87	2.13	2.17	2.45	3.89	
175	2.48	1.78	2.37	2.31	2.18	2.47	2.66	2.41	2.68	2.92	2.32	2.26	2.13	2.12	2.25	2.25	
180	1.39	1.83	2.12	2.31	2.08	2.22	2.35	2.05	0.88	1.12	1.81	2.16	2.18	2.12	2.30	2.15	

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-12-26	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	87006		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171202 0-A2	120.0	60	0.0798	9.351	0.9769	15.52
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

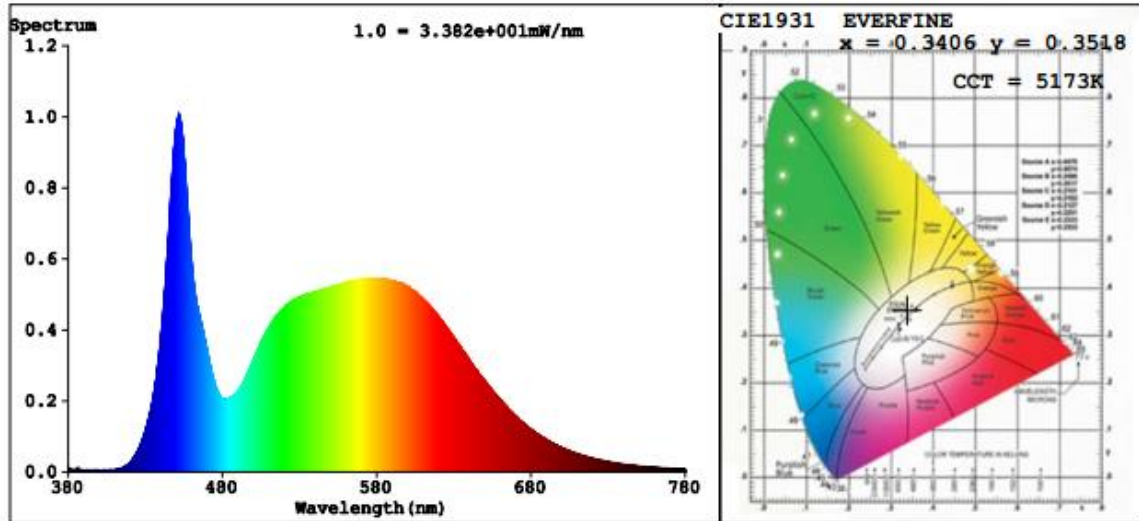
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	10
Frequency (Hz)	60	R2	88	R10	70
CCT (K)	5173	R3	91	R11	82
Duv	0.0019	R4	83	R12	58
Chromaticity (x, y)	x=0.3406 y=0.3518	R5	82	R13	83
Chromaticity (u', v')	u'=0.2083 v'=0.4841	R6	82	R14	95
Color Rendering Index (CRI)	82.9	R7	87	R15	77
R9	10	R8	69	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result	DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	--	
Frequency (Hz)	60		
Total Luminous (lm)	1289	--	
Total Luminous (lm)/Total Length(ft)	654.8	$\geq 375\text{lm/ft}(-10\%)$	
Luminous Efficacy (lm/W)	137.85	Standard: $\geq 105(-3\%)$	Premium: $\geq 130(-3\%)$

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)
870XX10W_30K	3000K	1248.0	9.195	135.73
87005	4000K	1269 ^{*1}	9.273 ^{*2}	136.89 ^{*3}
87006	5000K	1289	9.351	137.85

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

$$1269 = (1289 - 1248.0) / 4 * 2 + 1248.0$$

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

$$9.273 = (9.195 + 9.351) / 2$$

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

$$136.89 = 1269 / 9.273$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-331	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-01	2018-06-30
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
EE-09	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-01	2018-06-30
PF210	Power Meter for Goniophotometer	2017-07-01	2018-06-30
ST-R-181A	Temperature Tester	2017-07-01	2018-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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