



SHENZHEN XIN AN BIAO TECHNOLOGY SERVICE CO. LTD

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# Energy Star Test Report

For

## IKIO LED LIGHTING

(Brand Name: IKIO)

8470 Allison Pointe Blvd, Suite 128 Indianapolis, IN 46250

### Model name(s):

## IK-DLR6L-121722-CCT

**Report Type:** Testing and Report According to ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2

**Type of Luminaire:** Downlights

**Test Date:** 2022-02-26

**Report Date:** 2022-03-11

*Kyle Xiao*

Engineer: Kyle Xiao

*Garman Mo*

Manager: Garman Mo

Note: 1.The results contained in this report pertain only to the tested samples.  
2.This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.  
3.This report contains data that are not covered by the A2LA accreditation.

1.1 Product Information:		
Model Number	IK-DLR6L-121722-CCT	
Remark	<p>The CCT and power are adjustable.  The default CCT setting is 2700K.  The most consumptive CCT setting is 2700K.  The most ineffective CCT setting is 2700K  All tests and evaluations are performed at the lowest effective white light setting.</p>	
Representative (Tested) Model	IK-DLR6L-121722-CCT	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Downlights	
Directional/Non-directional	Directional	
Mounting Type	Recessed	
IC/Non-IC	IC	
LED Manufacturer	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch	
LED Model	HL-AS-2835HW-2C-S1-08-PCT-HR3	
Dimming	Dimmable	
Sample Number	JBE220104-A1	
Date of Receipt	2022-02-23	
Use of Senarios	Indoor	
Luminaire Aperture	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120-277Vac, 60Hz
Nominal Power	12W/17W/22W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,5000K (Color Tunable)

### 1.3 Product Photos

#### IK-DLR6L-121722-CCT



#### 1.4 Test Specifications:

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> <li>8. Color Angular Uniformity</li> <li>9. Dimming</li> <li>10. Flicker</li> <li>11. Operating Frequency</li> <li>12. Starting Time</li> <li>13. Transient Protection Test</li> <li>14. In-Situ Temperature Measurement Test</li> <li>15. Standby Power Consumption</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 C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. C82.77-10:2014 American National Standard for Lighting Equipment-Harmonic Emission Limits-Related Power Quality Requirements</li> <li>4. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>5. CIE 15-2004 Technical Report Colorimetry</li> <li>6. ANSI/UL 1598:2008,Luminaire</li> <li>7. ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) – Version 2.2</li> <li>8. ANSI/IEEE C62.41.2:2002 IEEE Recommended Practice on Characterization of Surges in Low-Voltage(1000V and Less) AC Power Circuits</li> <li>9. IEC 62301:2011Household electrical appliances - Measurement of standby power</li> <li>10. NEMA 77-2017 Standard for Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria</li> </ol>
Remark	<p>Below test and data are not covered by A2LA accreditation:</p> <ul style="list-style-type: none"> <li>- Operating Frequency</li> <li>- Noise</li> </ul>

## 1.5 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals.

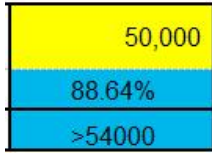
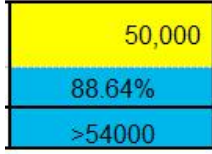
### 2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . 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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . 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 Summary of Test Result

Criteria Item	The Type of Luminaires	Requirement (ES for Luminaires V2.2)	Measured Value	Status
Input Wattage	All	$\leq$ Rated Wattage	21.14W	Pass
Luminous Efficacy	Downlights	$\geq 55$ lm/W	84.68lm/W	Pass
Luminaire Minimum Light Output	Downlights	$\leq 4.5''$ aperture: 345 lumens $> 4.5''$ aperture: 575 lumens	1790.2lm	Pass
Luminaire Zonal Lumen Density Requirement	Downlights	$\geq 75\%$ of total initial lumens within the 0-60° zone	91.2%	Pass
Correlated Color Temperature (CCT)	Solid State	Shall be capable of providing at least one of the following nominal correlated color temperatures (CCTs): • 2700 Kelvin • 3000 Kelvin • 3500 Kelvin • 4000 Kelvin • 5000 Kelvin	2673K Duv=0.0019	Pass
Color Rendering Index (CRI)	Solid State	$R_a \geq 80$ $R_9 > 0$	$R_a = 91.7$ $R_9 = 56$	Pass
Color Angular Uniform	Directional Solid State Indoor Luminaires	The variation of chromaticity shall be within 0.006 from the weighted average point on the CIE 1976(u',v') diagram	0.0007	Pass
Lumen Maintenance	Solid State Option 1:	L70 lumen maintenance: $\geq 25,000$ hours for indoor $\geq 35,000$ hours for outdoor $\geq 50,000$ hours for inseparable luminaires		Pass
Light Source Life	Solid State	L70 lumen maintenance: $\geq 25,000$ hours for indoor $\geq 35,000$ hours for outdoor $\geq 50,000$ hours for		Pass

		inseparable luminaires		
Color Maintenance	Solid State Indoor Luminaires	$\Delta u'v' \leq 0.007$	Max.0.0041 in LM-80 report*	Pass
Source Start Time	Solid State	<750 ms	34ms	Pass
Power Factor	Solid State	Total luminaire input power $\leq 5$ watts: PF $\geq 0.5$ Total luminaire input power > 5 watts: PF $\geq 0.7$	0.954	Pass
Transient Protection	Solid State	The line transient shall consist of seven strikes of a 100 kHz ring wave, 2.5 kV level, for both common mode and differential mode.	Survival	Pass
Standby Power Consumption	All Luminaires	Luminaires shall not draw power in the off state.	0W	Pass
Operating Frequency	Solid State	Frequency $\geq 120$ Hz	120.000Hz	Pass
Maximum Measured Driver Case Temperature	Solid State	shall not exceed the driver manufacturer's maximum recommended temperature during in situ operation. $\leq 105$ °C	66.8°C	Pass
Maximum In-Situ Source Temperature	Solid State	Maximum permitted Ts temperature for L70 $\geq$ 50,000 hrs $\leq 105$ °C	74.5°C	Pass
Dimming	Solid State	The luminaire and its components shall provide continuous dimming from 100% to 20% of total light output. Luminaire shall not emit noise above 24dBA at 1 meter or less at the minimum output.	Validated	Pass



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Warranty Requirements	Solid State	incorporating replaceable drivers: $\geq 3$ years incorporating non-replaceable drivers: $\geq 5$ years	5 years	Pass
CCT	Solid State	Packaging shall clearly describe the nominal color designation in units of Kelvin (e.g. 2700K, 3000K).	2700K,3000K, 3500K,4000K, 5000K	Pass

Note: The information or data with an “\*” are provided by the manufacturer.

Our laboratory has no responsibility for the decision of compliance with specification that based on the data or information with the “\*”.



<b>2.2.1 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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Test date	2022-02-26	Test Ambient:	25.1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	IK-DLR6L-121722-CCT (mode:2700K)	Total Operating Time (min)	90

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JBE220104-A1	120.0	60	0.954	21.14	0.954

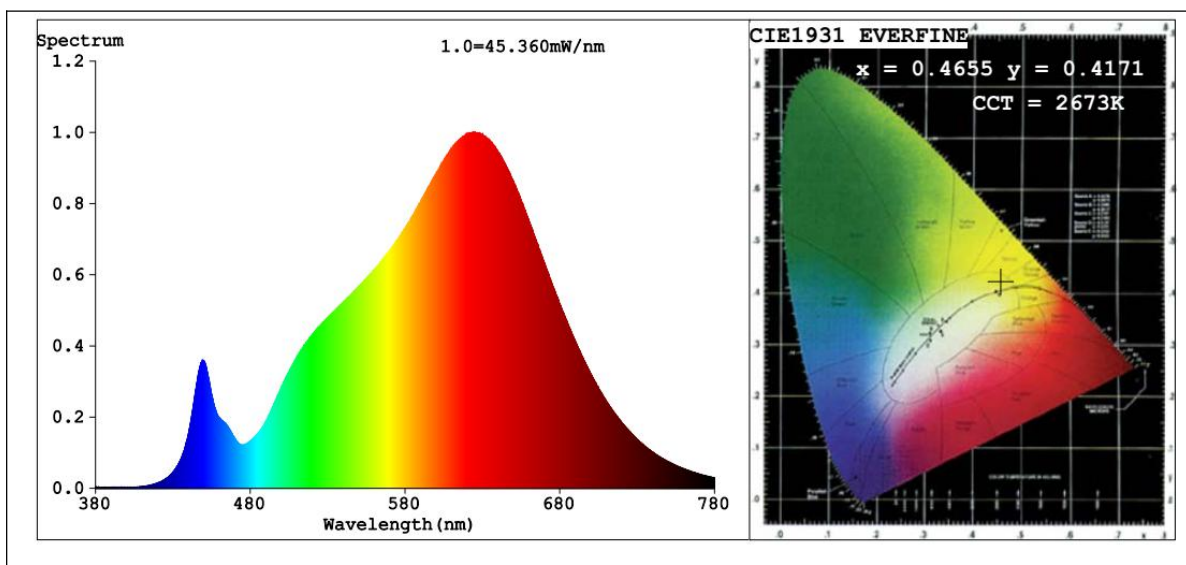
**Sphere-Spectroradiometer Method(Self-absorption:1.0872):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	91.7
R9	56
CCT (K)	2673
Duv	0.0019

**Goniophotometer Method(Test Distance:11.50m):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1790.2
Luminous Efficacy (lm/W)	84.68
Beam Angle°	93.0
Center Beam Candle Power (cd)	855

## Spectral Power Distribution and Chromaticity Diagram



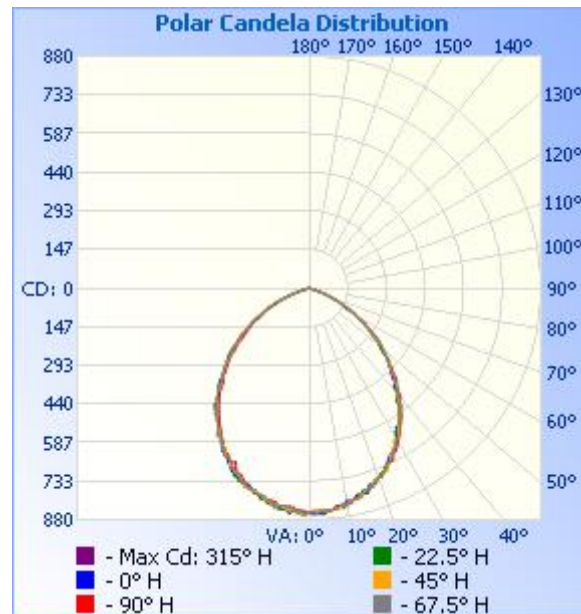
## Colorimetric Parameters

### Color Parameters:

Chromaticity Coordinate:  $x=0.4655$   $y=0.4171$   $u'=0.2632$   $v'=0.5306$   
 CCT=2673K (Duv=0.0019) Dominant WL:Ld =583.8nm WL:Lc = --nm Purity=64.9%  
 Ratio: R=26.4% G=71.5% B=2.0% Peak WL:Lp=625.3nm FWHM=146.4nm  
 Render Index: Ra=91.7 AvgR=88.4 TM30:Rf=92 Rg=99

R1 =92	R2 =94	R3 =96	R4 =93	R5 =91	R6 =94	R7 =93
R8 =81	R9 =56	R10=86	R11=94	R12=80	R13=92	R14=97 R15=87

## Zonal Lumen Tabulation



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	638.9	35.7%
0-40	1,015.5	56.7%
0-60	1,631.8	91.2%
60-90	158.0	8.8%
70-100	20.2	1.1%
90-120	0	0%
0-90	1,789.9	100%
90-180	0	0%
0-180	1,789.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	%Total
0-10	80.3	4.5%	90-100	0	0%
10-20	226.4	12.6%	100-110	0	0%
20-30	332.2	18.6%	110-120	0	0%
30-40	376.6	21.0%	120-130	0	0%
40-50	350.3	19.6%	130-140	0	0%
50-60	266.1	14.9%	140-150	0	0%
60-70	137.9	7.7%	150-160	0	0%
70-80	20.2	1.1%	160-170	0	0%
80-90	0	0.0%	170-180	0	0%



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	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
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61	185	185	185	185	198	212	212	225	212	225	212	212	198	198	198	185	185
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81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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Project No.:JBE220104 Report No.:JBE220104-A

Report Format Number STP-QP019-103-A/1

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125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

<b>2.2.2 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
--	-----------------------

Test date	2022-02-26	Test Ambient:	25.1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	IK-DLR6L-121722-CCT (mode:3000K)	Total Operating Time (min)	90

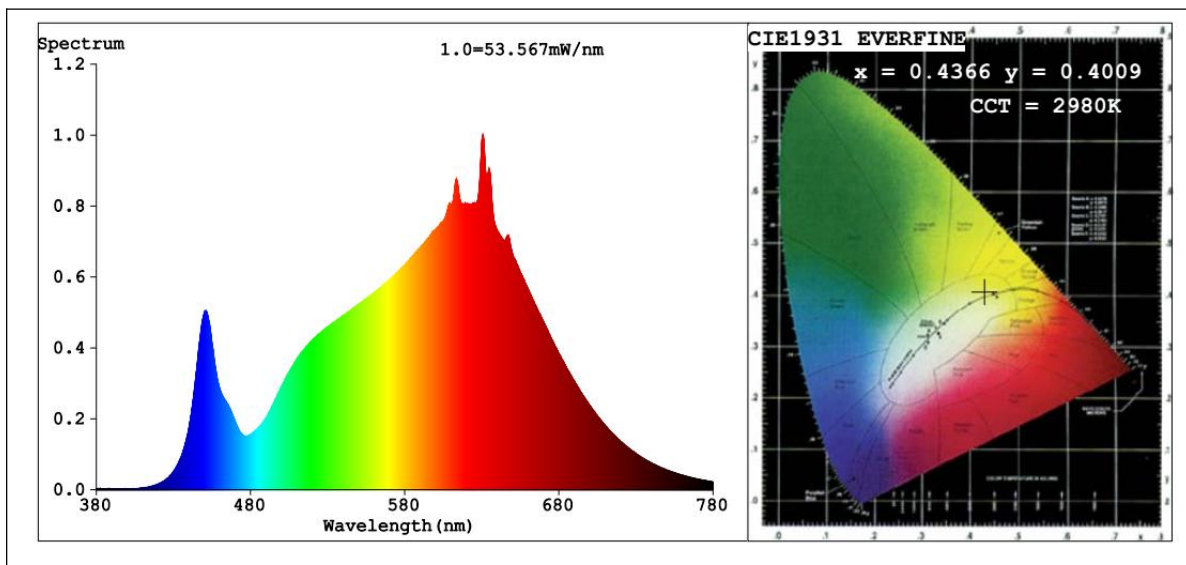
**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JBE220104-A1	120.0	60	0.181	20.57	0.947

**Sphere-Spectroradiometer Method(Self-absorption:1.0875):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	93.5
R9	65
CCT (K)	2980
Duv	-0.0012
Total Luminous (lm)	1886
Luminous Efficacy (lm/W)	91.69

## Spectral Power Distribution and Chromaticity Diagram



## Colorimetric Parameters

### Color Parameters:

Chromaticity Coordinate:  $x=0.4366$   $y=0.4009$   $u'=0.2517$   $v'=0.5201$

CCT=2980K (Duv=-0.0012) Dominant WL:Ld =583.3nm WL:Lc = --nm Purity=51.4%

Ratio:R=24.7% G=72.7% B=2.7% Peak WL:Lp=630.6nm FWHM=124.6nm

Render Index:Ra=93.5 AvgR=90.7 TM30:Rf=91 Rg=102

R1 =95	R2 =96	R3 =96	R4 =94	R5 =94	R6 =95	R7 =93
R8 =85	R9 =65	R10=90	R11=95	R12=80	R13=95	R14=97 R15=91

<b>2.2.3 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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Test date	2022-02-26	Test Ambient:	25.1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	IK-DLR6L-121722-CCT (mode:3500K)	Total Operating Time (min)	90

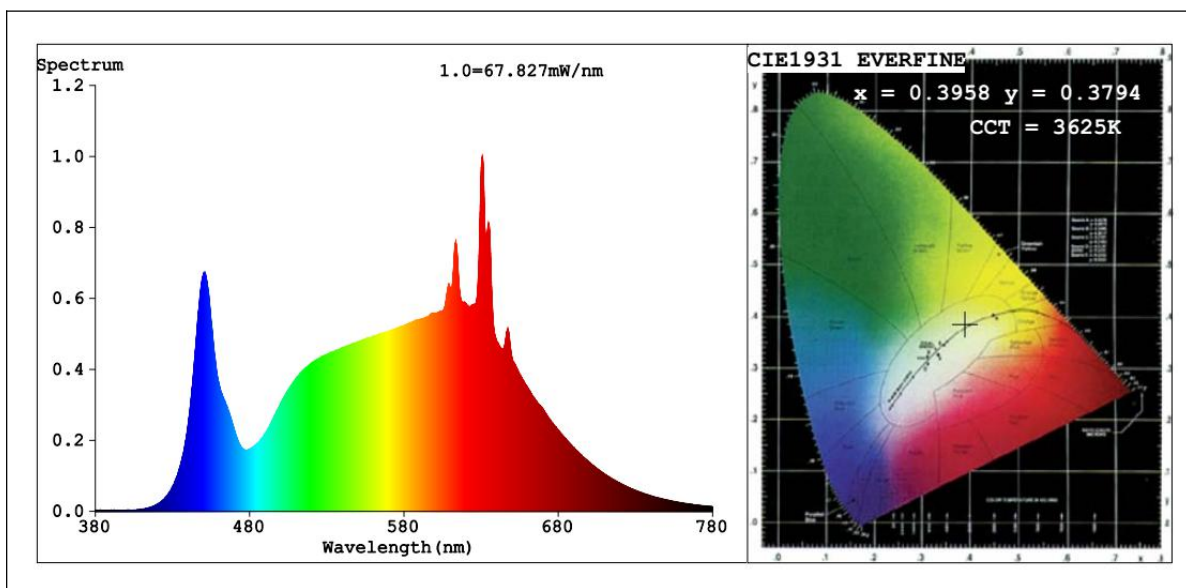
**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JBE220104-A1	120.0	60	0.177	20.05	0.944

**Sphere-Spectroradiometer Method(Self-absorption:1.0872):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	94.6
R9	74
CCT (K)	3625
Duv	-0.0029
Total Luminous (lm)	2064
Luminous Efficacy (lm/W)	102.94

## Spectral Power Distribution and Chromaticity Diagram



## Colorimetric Parameters

### Color Parameters:

Chromaticity Coordinate: $x=0.3958$   $y=0.3794$ / $u'=0.2342$   $v'=0.5050$

CCT=3625K(Duv=-0.0029) Dominant WL:Ld =581.8nm WL:Lc = --nm Purity=32.7%

Ratio:R=21.8% G=74.7% B=3.5% Peak WL:Lp=630.8nm FWHM=76.0nm

Render Index:Ra=94.6 AvgR=91.9 TM30:Rf=92 Rg=102

R1 =97	R2 =96	R3 =94	R4 =95	R5 =96	R6 =94	R7 =95
R8 =90	R9 =74	R10=90	R11=95	R12=76	R13=97	R14=96 R15=95

<b>2.2.4 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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<b>Test date</b>	2022-02-26	<b>Test Ambient:</b>	25.1° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	IK-DLR6L-121722-CCT (mode:4000K)	<b>Total Operating Time (min)</b>	90

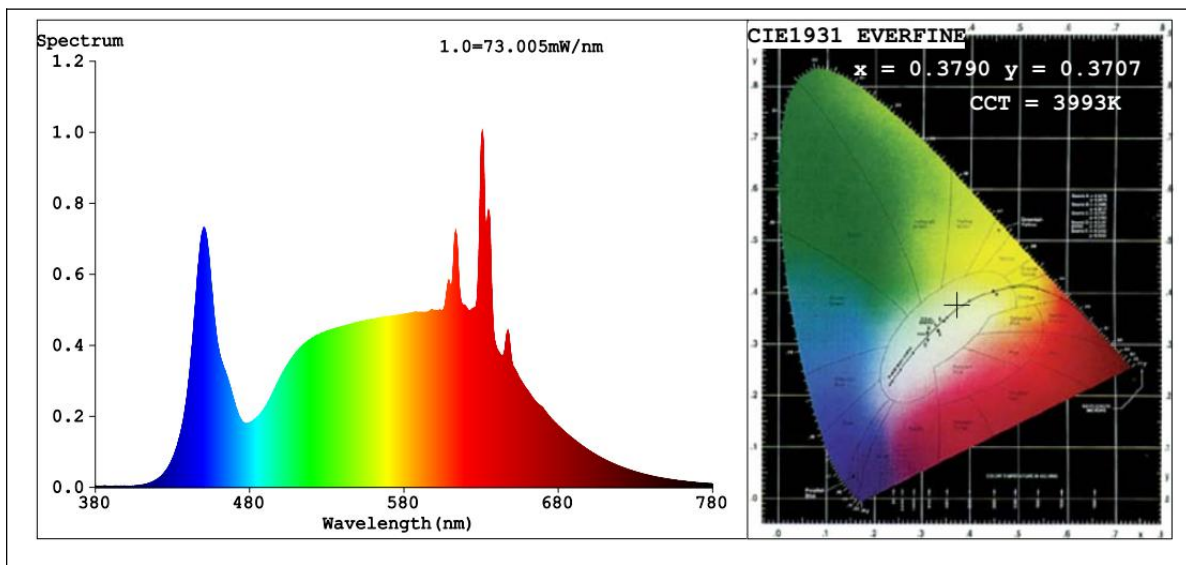
**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JBE220104-A1	120.0	60	0.177	20.09	0.945

**Sphere-Spectroradiometer Method(Self-absorption:1.0871):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	94.3
R9	75
CCT (K)	3993
Duv	-0.0025
Total Luminous (lm)	2109
Luminous Efficacy (lm/W)	104.98

## Spectral Power Distribution and Chromaticity Diagram



## Colorimetric Parameters

### Color Parameters:

Chromaticity Coordinate: $x=0.3790$   $y=0.3707$ / $u'=0.2266$   $v'=0.4987$

CCT=3993K(Duv=-0.0025) Dominant WL:Ld =580.6nm WL:Lc = --nm Purity=25.0%

Ratio:R=20.4% G=75.7% B=3.9% Peak WL:Lp=630.8nm FWHM=14.4nm

Render Index:Ra=94.3 AvgR=91.4 TM30:Rf=91 Rg=102

R1 =96	R2 =96	R3 =93	R4 =95	R5 =95	R6 =93	R7 =95
R8 =91	R9 =75	R10=88	R11=94	R12=73	R13=96	R14=95 R15=95



<b>2.2.5 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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Test date	2022-02-26	Test Ambient:	25.1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	IK-DLR6L-121722-CCT (mode:5000K)	Total Operating Time (min)	90

**Electrical Measurement:**

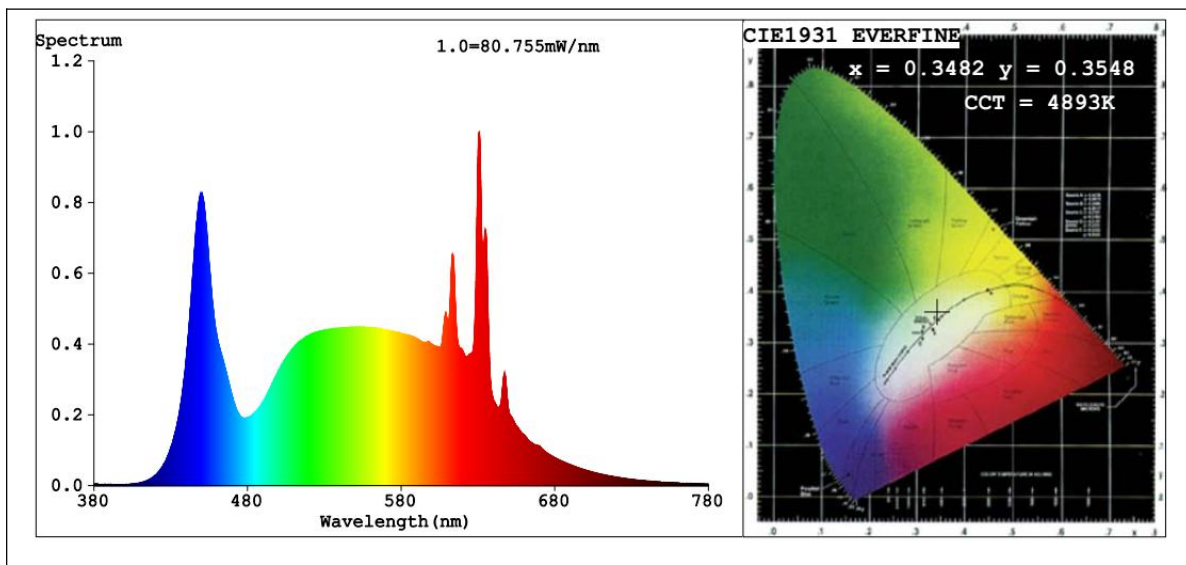
Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JBE220104-A1	120.0	60	0.180	20.38	0.946

**Sphere-Spectroradiometer Method(Self-absorption:1.0871):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	92.2
R9	68
CCT (K)	4893
Duv	0.0003
Total Luminous (lm)	2143
Luminous Efficacy (lm/W)	105.15



## Spectral Power Distribution and Chromaticity Diagram



## Colorimetric Parameters

### Color Parameters:

Chromaticity Coordinate: $x=0.3482$   $y=0.3548$ / $u'=0.2123$   $v'=0.4867$

CCT=4893K(Duv=0.0003) Dominant WL:Ld =573.7nm WL:Lc = --nm Purity=10.9%

Ratio:R=17.8% G=77.6% B=4.6% Peak WL:Lp=630.9nm FWHM=8.4nm

Render Index:Ra=92.2 AvgR=88.5 TM30:Rf=90 Rg=101

R1 =94	R2 =93	R3 =91	R4 =94	R5 =92	R6 =90	R7 =95
R8 =90	R9 =68	R10=82	R11=93	R12=66	R13=93	R14=94 R15=92



<b>2.2.6 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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Test date	2022-02-26	Test Ambient:	25.1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	IK-DLR6L-121722-CCT (mode:17 W/2700K)	Total Operating Time (min)	90

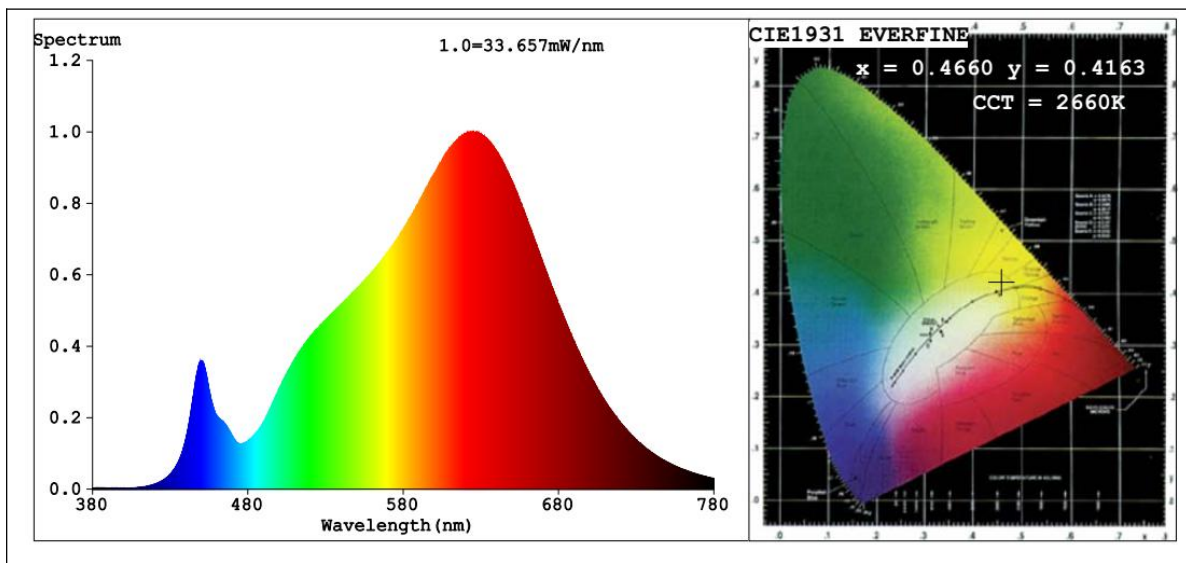
**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JBE220104-A1	120.0	60	0.153	16.96	0.926

**Sphere-Spectroradiometer Method(Self-absorption:1.0874):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	91.8
R9	57
CCT (K)	2660
Duv	0.0016
Total Luminous (lm)	1484
Luminous Efficacy (lm/W)	87.50

## Spectral Power Distribution and Chromaticity Diagram



## Colorimetric Parameters

### Color Parameters:

Chromaticity Coordinate: $x=0.4660$   $y=0.4163$ / $u'=0.2639$   $v'=0.5304$

CCT=2660K(Duv=0.0016) Dominant WL:Ld =583.9nm WL:Lc = --nm Purity=64.9%

Ratio:R=26.6% G=71.4% B=2.0% Peak WL:Lp=625.3nm FWHM=145.5nm

Render Index:Ra=91.8 AvgR=88.6 TM30:Rf=92 Rg=99

R1 =92	R2 =95	R3 =96	R4 =93	R5 =91	R6 =94	R7 =93
R8 =81	R9 =57	R10=87	R11=94	R12=80	R13=92	R14=97
						R15=87

<b>2.2.7 Electrical, Photometric and Chromaticity Measurements</b>	<b>IES LM-79 2008</b>
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Test date	2022-02-26	Test Ambient:	25.1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	IK-DLR6L-121722-CCT (mode:12 W/2700K)	Total Operating Time (min)	90

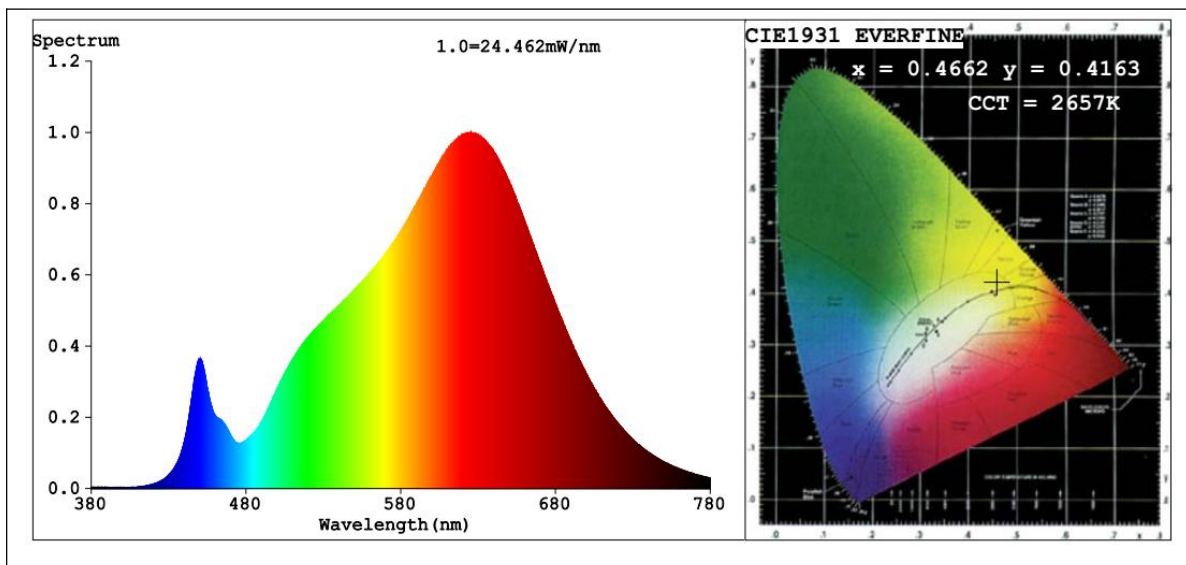
**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
JBE220104-A1	120.0	60	0.106	11.58	0.9086

**Sphere-Spectroradiometer Method(Self-absorption:1.0875):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Color Rendering Index (CRI)	92.1
R9	57
CCT (K)	2657
Duv	0.0016
Total Luminous (lm)	1045
Luminous Efficacy (lm/W)	90.24

## Spectral Power Distribution and Chromaticity Diagram



## Colorimetric Parameters

### Color Parameters:

Chromaticity Coordinate:  $x=0.4662$   $y=0.4163$   $u'=0.2640$   $v'=0.5305$

CCT=2657K (Duv=0.0016) Dominant WL:Ld =583.9nm WL:Lc = --nm Purity=64.9%

Ratio:R=26.6% G=71.3% B=2.1% Peak WL:Lp=625.3nm FWHM=144.9nm

Render Index:Ra=92.1 AvgR=88.9 TM30:Rf=92 Rg=99

R1 =92	R2 =95	R3 =96	R4 =93	R5 =92	R6 =94	R7 =93
R8 =81	R9 =57	R10=87	R11=94	R12=80	R13=93	R14=97
						R15=88



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### 2.3 Color Angular Uniformity

IES LM-79 2008

**ENERGY STAR® Program Requirements  
Product Specification for Luminaires (Light  
Fixtures) - Version 2.2**

### Test Data:

Test date	2022-02-26	Test Ambient	25.1°C
Sample No.	Maximum $\Delta u'v'$		
JBE220104-A1	0.0007		



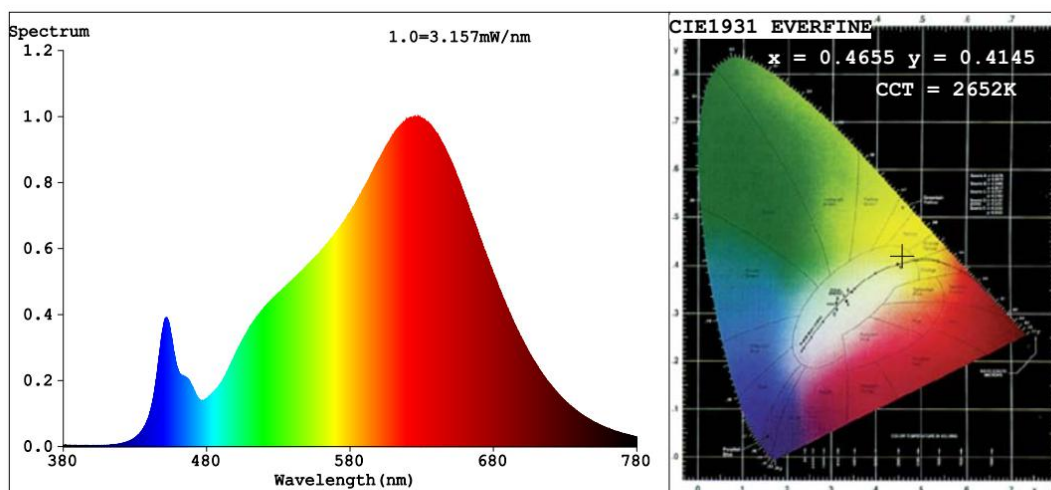
C0				C90			
gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$	gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$
0	-0.00041	-0.00017	0.00044	0	-0.00032	-0.00024	0.00040
1	-0.00034	-0.00015	0.00037	1	-0.00021	-0.00026	0.00034
2	-0.00034	-0.00015	0.00037	2	-0.00025	-0.00023	0.00034
3	-0.00034	-0.00015	0.00037	3	-0.00021	-0.00026	0.00034
4	-0.00034	-0.00015	0.00037	4	-0.00025	-0.00023	0.00034
5	-0.00034	-0.00015	0.00037	5	-0.00021	-0.00026	0.00034
6	-0.00028	-0.00014	0.00031	6	-0.00019	-0.00021	0.00028
7	-0.00028	-0.00014	0.00031	7	-0.00014	-0.00025	0.00029
8	-0.00028	-0.00014	0.00031	8	-0.00019	-0.00021	0.00028
9	-0.00017	-0.00016	0.00023	9	-0.00012	-0.00020	0.00023
10	-0.00017	-0.00016	0.00023	10	-0.00012	-0.00020	0.00023
11	-0.00021	-0.00012	0.00025	11	-0.00006	-0.00018	0.00019
12	-0.00010	-0.00014	0.00018	12	-0.00006	-0.00018	0.00019
13	-0.00015	-0.00011	0.00018	13	-0.00006	-0.00018	0.00019
14	-0.00009	-0.00009	0.00012	14	0.00000	-0.00017	0.00017
15	-0.00009	-0.00009	0.00012	15	-0.00004	-0.00013	0.00013
16	-0.00002	-0.00008	0.00008	16	0.00002	-0.00011	0.00012
17	0.00002	-0.00011	0.00012	17	0.00002	-0.00011	0.00012
18	0.00004	-0.00006	0.00007	18	0.00009	-0.00010	0.00013
19	0.00004	-0.00006	0.00007	19	0.00015	-0.00008	0.00017
20	0.00004	-0.00006	0.00007	20	0.00015	-0.00008	0.00017
21	0.00011	-0.00005	0.00012	21	0.00022	-0.00007	0.00023
22	0.00011	-0.00005	0.00012	22	0.00017	-0.00003	0.00017
23	0.00013	0.00001	0.00013	23	0.00024	-0.00002	0.00024
24	0.00013	0.00001	0.00013	24	0.00024	-0.00002	0.00024
25	0.00019	0.00002	0.00019	25	0.00030	0.00000	0.00030
26	0.00019	0.00002	0.00019	26	0.00025	0.00004	0.00026
27	0.00025	0.00004	0.00026	27	0.00032	0.00005	0.00032
28	0.00025	0.00004	0.00026	28	0.00032	0.00005	0.00032
29	0.00032	0.00005	0.00032	29	0.00038	0.00007	0.00039
30	0.00032	0.00005	0.00032	30	0.00038	0.00007	0.00039
31	0.00032	0.00005	0.00032	31	0.00038	0.00007	0.00039
32	0.00032	0.00005	0.00032	32	0.00045	0.00008	0.00045
33	0.00038	0.00007	0.00039	33	0.00038	0.00007	0.00039
34	0.00038	0.00007	0.00039	34	0.00045	0.00008	0.00045
35	0.00034	0.00010	0.00035	35	0.00038	0.00007	0.00039
36	0.00038	0.00007	0.00039	36	0.00045	0.00008	0.00045
37	0.00038	0.00007	0.00039	37	0.00045	0.00008	0.00045
38	0.00038	0.00007	0.00039	38	0.00038	0.00007	0.00039
39	0.00032	0.00005	0.00032	39	0.00038	0.00007	0.00039
40	0.00032	0.00005	0.00032	40	0.00038	0.00007	0.00039
41	0.00032	0.00005	0.00032	41	0.00032	0.00005	0.00032
42	0.00036	0.00001	0.00036	42	0.00032	0.00005	0.00032
43	0.00030	0.00000	0.00030	43	0.00025	0.00004	0.00026
44	0.00024	-0.00002	0.00024	44	0.00025	0.00004	0.00026
45	0.00024	-0.00002	0.00024	45	0.00019	0.00002	0.00019
46	0.00017	-0.00003	0.00017	46	0.00017	-0.00003	0.00017
47	0.00022	-0.00007	0.00023	47	0.00011	-0.00005	0.00012

C180				C270			
gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$	gamma	$\Delta u'$	$\Delta v'$	$\Delta u'v'$
0	-0.00041	-0.00017	0.00044	0	-0.00032	-0.00024	0.00040
1	-0.00034	-0.00015	0.00037	1	-0.00025	-0.00023	0.00034
2	-0.00034	-0.00015	0.00037	2	-0.00025	-0.00023	0.00034
3	-0.00041	-0.00017	0.00044	3	-0.00021	-0.00026	0.00034
4	-0.00034	-0.00015	0.00037	4	-0.00025	-0.00023	0.00034
5	-0.00034	-0.00015	0.00037	5	-0.00032	-0.00024	0.00040
6	-0.00039	-0.00011	0.00040	6	-0.00025	-0.00023	0.00034
7	-0.00039	-0.00011	0.00040	7	-0.00025	-0.00023	0.00034
8	-0.00039	-0.00011	0.00040	8	-0.00025	-0.00023	0.00034
9	-0.00032	-0.00010	0.00034	9	-0.00025	-0.00023	0.00034
10	-0.00032	-0.00010	0.00034	10	-0.00019	-0.00021	0.00028
11	-0.00032	-0.00010	0.00034	11	-0.00023	-0.00017	0.00029
12	-0.00037	-0.00006	0.00037	12	-0.00019	-0.00021	0.00028
13	-0.00030	-0.00005	0.00031	13	-0.00023	-0.00017	0.00029
14	-0.00030	-0.00005	0.00031	14	-0.00017	-0.00016	0.00023
15	-0.00030	-0.00005	0.00031	15	-0.00017	-0.00016	0.00023
16	-0.00024	-0.00003	0.00024	16	-0.00017	-0.00016	0.00023
17	-0.00028	0.00001	0.00028	17	-0.00015	-0.00011	0.00018
18	-0.00028	0.00001	0.00028	18	-0.00015	-0.00011	0.00018
19	-0.00022	0.00002	0.00022	19	-0.00015	-0.00011	0.00018
20	-0.00022	0.00002	0.00022	20	-0.00009	-0.00009	0.00012
21	-0.00026	0.00006	0.00027	21	-0.00009	-0.00009	0.00012
22	-0.00020	0.00007	0.00021	22	-0.00013	-0.00005	0.00014
23	-0.00020	0.00007	0.00021	23	-0.00007	-0.00004	0.00008
24	-0.00014	0.00009	0.00016	24	-0.00007	-0.00004	0.00008
25	-0.00024	0.00011	0.00027	25	-0.00007	-0.00004	0.00008
26	-0.00018	0.00013	0.00022	26	-0.00007	-0.00004	0.00008
27	-0.00018	0.00013	0.00022	27	0.00000	-0.00002	0.00002
28	-0.00012	0.00014	0.00018	28	0.00000	-0.00002	0.00002
29	-0.00018	0.00013	0.00022	29	0.00000	-0.00002	0.00002
30	-0.00022	0.00016	0.00028	30	0.00000	-0.00002	0.00002
31	-0.00016	0.00018	0.00024	31	0.00000	-0.00002	0.00002
32	-0.00016	0.00018	0.00024	32	0.00000	-0.00002	0.00002
33	-0.00016	0.00018	0.00024	33	0.00000	-0.00002	0.00002
34	-0.00022	0.00016	0.00028	34	0.00000	-0.00002	0.00002
35	-0.00027	0.00020	0.00034	35	-0.00005	0.00001	0.00005
36	-0.00027	0.00020	0.00034	36	-0.00007	-0.00004	0.00008
37	-0.00027	0.00020	0.00034	37	-0.00007	-0.00004	0.00008
38	-0.00027	0.00020	0.00034	38	-0.00013	-0.00005	0.00014
39	-0.00033	0.00019	0.00038	39	-0.00013	-0.00005	0.00014
40	-0.00033	0.00019	0.00038	40	-0.00019	-0.00007	0.00021
41	-0.00035	0.00013	0.00038	41	-0.00021	-0.00012	0.00025
42	-0.00040	0.00017	0.00043	42	-0.00021	-0.00012	0.00025
43	-0.00046	0.00016	0.00049	43	-0.00028	-0.00014	0.00031
44	-0.00053	0.00014	0.00054	44	-0.00034	-0.00015	0.00037
45	-0.00059	0.00013	0.00060	45	-0.00036	-0.00020	0.00041
46	-0.00065	0.00011	0.00066	46	-0.00049	-0.00023	0.00054
47	-0.00067	0.00006	0.00068	47	-0.00055	-0.00025	0.00061



<b>2.4 Electrical and Photometric Measurements, with dimming</b>	<b>IES LM-79 2008 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
<b>Noted: The noise test and data are not covered by A2LA accreditation</b>	

Test date	2022-02-26		Test Ambient:	25.1° C
Dimmer Technology			0-10V	
Sample No.			Maximum Level	Minimum Level
JBE220104-A1	Input:	Light outout(Lumen)	1707	35.77
	120.0V / 60Hz	Percentage	95.35%	2.10%



### Color Parameters:

Chromaticity Coordinate:  $x=0.4655$   $y=0.4145$   $u'=0.2644$   $v'=0.5297$   
CCT=2652K (Duv=0.0010) Dominant WL:Ld =584.1nm WL:Lc = --nm Purity=64.2%  
Ratio: R=26.9% G=71.0% B=2.2% Peak WL:Lp=625.3nm FWHM=143.2nm  
Render Index: Ra=93.2 AvgR=90.3 TM30:Rf=92 Rg=99

R1 =94 R2 =96 R3 =97 R4 =94 R5 =93 R6 =96 R7 =93  
R8 =83 R9 =61 R10=90 R11=95 R12=82 R13=94 R14=98 R15=89

**The luminaires [can] ~~lean not~~ provide less than 20% of total light output with continuous dimmer.**

Dimming Way	Peak Noise Reading (dBA)	Test Condition	Distance between the microphone and the UUT
0-10V	18.7	Dimmer adjusted to lowest light output	< 1 m



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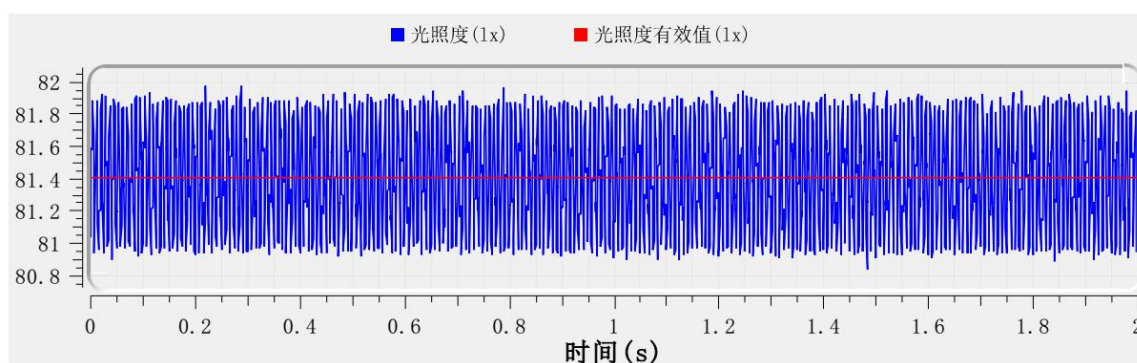
<b>2.5 Flicker</b>	<b>NEMA 77-2017 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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<b>Dimming Technology</b>	0-10V
<b>Dimmer</b>	--
<b>Sample No.</b>	JBE220104-A1

Item	Short Term Flicker Indicator (Pst)	Stroboscopic Visibility Measure (SVM)
<b>Maximum light output</b>	0.034	0.014
<b>50% light output</b>	0.118	0.000
<b>Minimum light output</b>	0.000	0.000

<b>2.6 Operating Frequency</b>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
<b>Noted: This test and data are not covered by A2LA accreditation</b>	

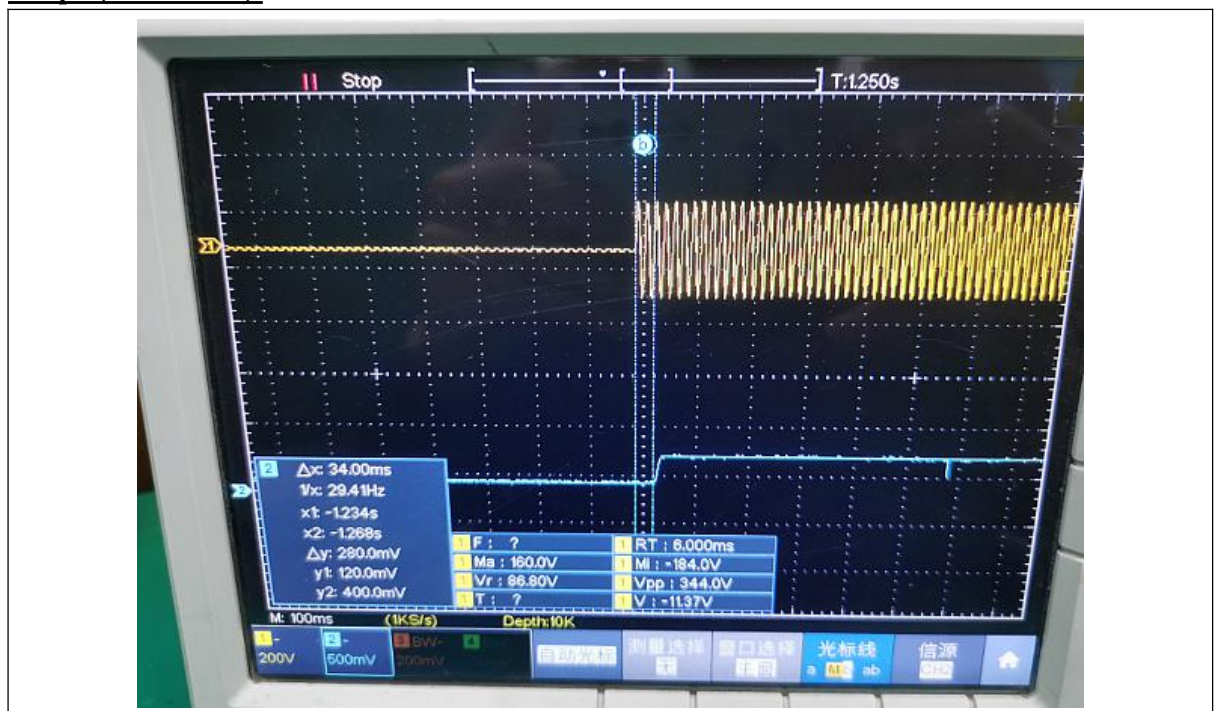
<b>Test date</b>	<b>2022-02-26</b>	<b>Test Ambient:</b>	<b>25.1° C</b>
<b>Sample No.</b>	<b>Operating Frequency (Hz)</b>		
JBE220104-A1	120.000		



2.7 Starting Time	ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2
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Test date	2022-02-26	Test Ambient:	25.1° C
Sample No.	Start Time (ms)		
JBE220104-A1	34		

**Graph (Start Time):**





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<b>2.8 Transient Protection Test</b>	<b>ANSI/IEEE C62.41 ENERGY STAR® Program Requirements for Luminaires – Version 2.2</b>
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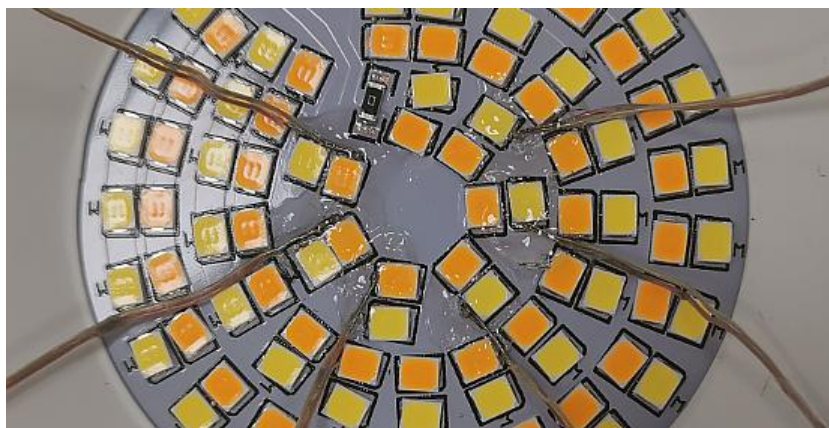
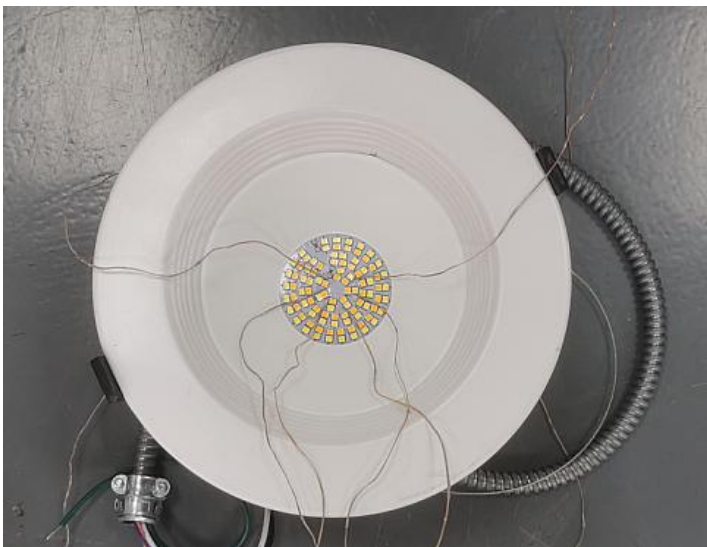
**Test voltage: 120V,60Hz**

<b>Test date</b>	<b>2022-02-26</b>	<b>Test Ambient</b>	<b>25.1° C</b>
<b>Sample No.</b>		<b>Transient Protection Test - Seven Strikes</b>	
JBE220104-A1		Survival	

**2.9 In-Situ Temperature Measurement Test (ISTMT) | ANSI/UL 1598:2008**

Test date	2022-02-26	Test Ambient	25.1° C
Input Vol./Frequency	120.0V / 60Hz	Output Current of Single LED(mA)	131.9
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum permitted Ts temperature for L70 $\geq$ 50,000 hrs (°C)
JBE220104-A1	HL-AS-2835HW-2C-S1-08-PCT-HR3	74.5	105

**In-Situ Picture - Ts:**

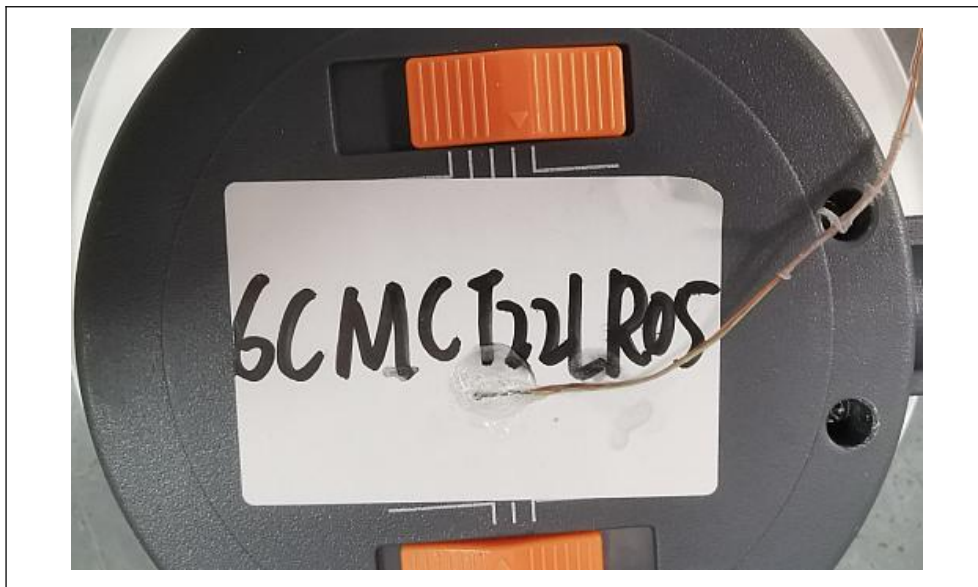




<b>2.10 Maximum Measured Ballast or Driver Case Temperature</b>	<b>ANSI/UL 1598:2008</b>
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Test date	2022-02-26	Test Ambient	25.1° C
Sample No.	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature Limited (°C)	
JBE220104-A1	66.8	105	

**In-Situ Picture - Ts:**





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<b>2.11 Standby Power Consumption:</b>	<b>ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.2</b>
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<b>Test date</b>	2022-02-26	<b>Test Ambient:</b>	25.1° C
<b>Model Number</b>	IK-DLR6L-121722-CCT	<b>Stabilization Time (min)</b>	60

### Electrical Measurement – when the luminaires turned off:

<b>Sample No.</b>	<b>Standby Power Consumption(W):</b>
JBE220104-A1	0





### 3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-S-451	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-S-455	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-S-452	Standard Lamp D204	2021-04-15	2022-04-14
ST-R-S-453	Power Meter for Integrating Sphere	2021-04-08	2022-04-06
ST-R-S-407	Goniophotometer system	Verified by S1530039 standard lamp	
ST-R-S-410	Standard Lamp S1530039	2021-04-15	2022-04-14
ST-R-S-408	Power Meter for Goniophotometer	2021-04-08	2022-04-06
ST-R-S-027	Digital Luxmeter	2021-04-08	2022-04-07
ST-R-S-016	Oscilloscope	2021-04-08	2022-04-06
ST-R-S-017	Probe	2021-04-08	2022-04-07
ST-R-361	ZLB61012X	2021-08-18	2022-08-17
ST-R-414	LFA-3000	2021-12-17	2022-12-16
Uncertainty: Photometric Measurement (Sphere):2.72%, k=2 Chromaticity Measurement(Sphere):43.60K, k=2 Photometric Measurement(Goniophotometer): 3.44%, k=2			

\*\*\*\*\* END OF DATASHEET PACKAGE \*\*\*\*\*