

LM-79-08 Test Report

For

Revolution Lighting Technologies, Inc.

(Brand Name: Revolution Lighting Technologies)

2280 Ward Ave. Simi Valley CA. 93065

Downlight

Model name(s): 21AM14-00X

Remark: X stands for Color Temperature, can be 0-2700K, 1-3000K,
2-3500K 3-4000K, 5-5000K.Representative (Tested) Model: 21AM14-001
21AM14-003
21AM14-005

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

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Mar.23,2018

Review By:

Tommy Liang

Manager: Tommy Liang

Remark: This is multiple listed report, the Project Number of the original report is GZE1706091-A.

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

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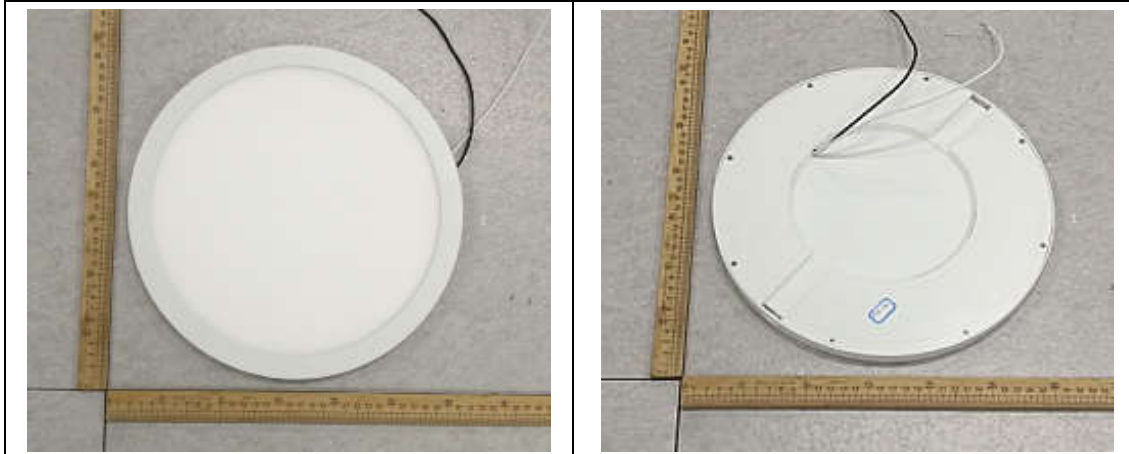
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	Revolution Lighting Technologies, Inc.	
Brand Name	Revolution Lighting Technologies	
Model Number	21AM14-00X	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Downlight	
Rated Voltage / Frequency	120Vac, 60 Hz	
Nominal Power	24W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K	
LED Manufacturer	XUYU OPTOELECTRONICS (SHENZHEN) CO.,LTD	
LED Model	XuYu LED 9v 100mA SMD-2835	
Sample Number	GZE1706091-D1(3000K),D2(4000K),D3(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	Jun.20,2017
Date of Test	Jun.21,2017
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Efficacy 3. Correlated Color Temperature 4. Color Rendering Index 5. Chromaticity Coordinate 6. 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

<p>1) 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.</p>
<p>2) 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.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-06-21	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	21AM14-001		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE170609 1-D1	120.0	60	0.2129	23.51	0.9203

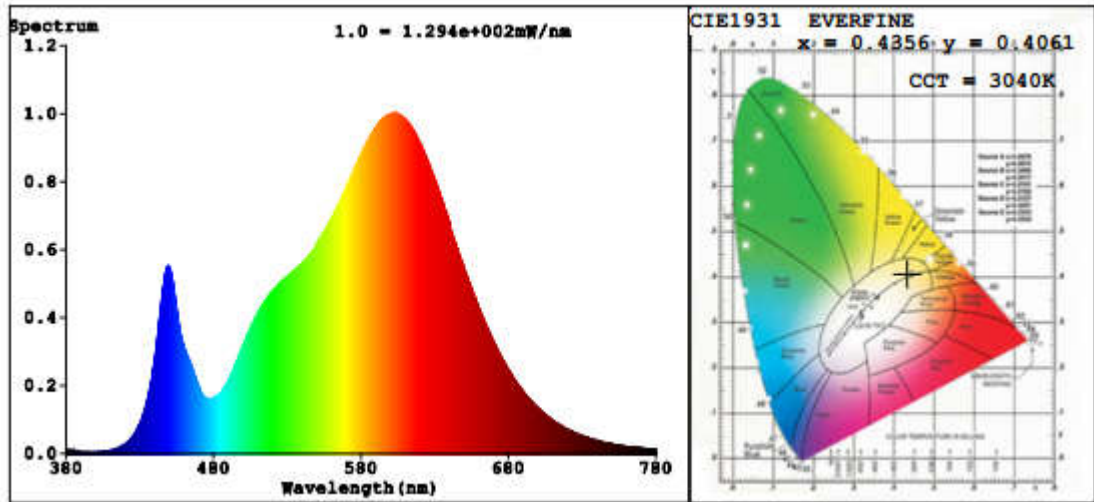
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	89	R10	75
CCT (K)	3040	R3	97	R11	79
Duv	0.0010	R4	80	R12	68
Chromaticity (x, y)	x=0.4356 y=0.4061	R5	79	R13	81
Chromaticity (u', v')	u'=0.2488 v'=0.5220	R6	87	R14	99
Color Rendering Index (CRI)	81.3	R7	83	R15	71
R9	0	R8	57	--	--

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	2026
Luminous Efficacy (lm/W)	86.19

Spectral Power Distribution & Chromaticity Diagram



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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-06-21	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	21AM14-003		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE170609 1-D2	120.0	60	0.2118	23.38	0.9198

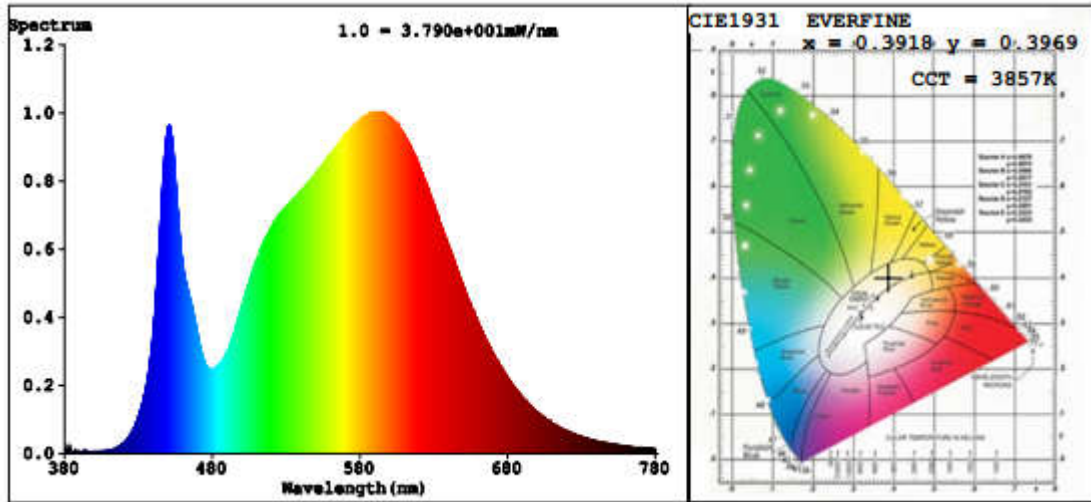
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	76	R9	0
Frequency (Hz)	60	R2	86	R10	66
CCT (K)	3857	R3	94	R11	76
Duv	0.0060	R4	78	R12	53
Chromaticity (x, y)	x=0.3918 y=0.3969	R5	76	R13	78
Chromaticity (u', v')	u'=0.2246 v'=0.5118	R6	80	R14	97
Color Rendering Index (CRI)	79.4	R7	86	R15	69
R9	0	R8	59	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	2033
Luminous Efficacy (lm/W)	86.95

Spectral Power Distribution & Chromaticity Diagram



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2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-06-21	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	21AM14-005		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE170609 1-D3	120.0	60	0.2127	23.49	0.9202

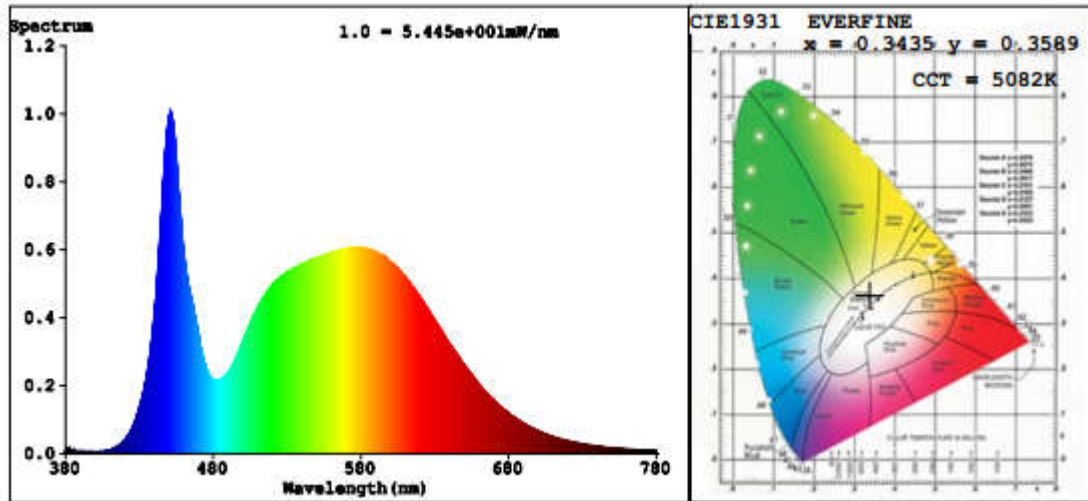
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	77	R9	0
Frequency (Hz)	60	R2	85	R10	64
CCT (K)	5082	R3	90	R11	78
Duv	0.0043	R4	79	R12	55
Chromaticity (x, y)	x=0.3435 y=0.3589	R5	78	R13	79
Chromaticity (u', v')	u'=0.2076 v'=0.4879	R6	80	R14	95
Color Rendering Index (CRI)	79.9	R7	86	R15	72
R9	0	R8	63	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	2062
Luminous Efficacy (lm/W)	87.78

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	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

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

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