



LM-79-08 Test Report

For

P.Q.L., Inc.

2285 Ward Avenue / Simi Valley, CA 93065

Model name(s): 93782

Report Type: Testing and Report According to IES LM-79-2008
Type of Luminaire: Retrofit Kits for Direct Linear Ambient Luminaires
Report Date: 2023-08-29
Ningbo TengLi Testing Co., Ltd
Prepared By: 2nd floor, Block B, Ningbo Testing and Certification Base,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
Ningbo, Zhejiang

Test & Report By:

Engineer: Wat Wang

Review By:

Manager: Nick Song

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.



1.1 Product Information:		
Model Number	93782	
Representative (Tested) Model	93782 (0%,3500K) 93782 (50%,4000K) 93782 (100%,5000K)	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Retrofit Kits for Direct Linear Ambient Luminaires	
LED Manufacturer	ShenZhen JuFei Optoelectronics Co., Ltd.	
LED Model	01.JT.CC2835W80P03	
Dimming	Continuous	
Integral Controls	No	
Sample Number	STD230824NB-A1	
Date of Receipt	Aug.13,2023	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120-277Vac, 50/60Hz
Nominal Power	20W/30W/40W (Power Adjustable)
Rated Initial Lamp Lumen	--
Declared CCT	3500K,4000K,5000K (Color Tunable)



1.3 Test Specifications:

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 C78.377-2015 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

1.4 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° 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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	Measured Value		Compliance	Requirement (DLC V5.1)	
Minimum Total Luminous	6021.6		Pass	≥375 lm/ft (-10%)	
Minimum Luminous Efficacy	149.32		Pass	Standard: ≥115(-3%)	Premium: ≥130(-3%)
Minimum Power Factor	0.9610		Pass	≥0.9(-3%)	
Maximum THD %	14.01		Pass	≤20(+5)	
Minimum CRI	82.6		Pass	≥80(-1)	
Minimum R9	5		Pass	≥0(-1)	
Minimum Rg	96		Pass	≥89(-1)	
Minimum Rf	83		Pass	≥70(-1)	
Res, h1	-12		Pass	-12%-23%(-1%)	
CCT (K)	3500K	3478	Pass	≤6500K	
	4000K	4170			
	5000K	5037			
Zonal Lumen Requirement	0-60°:	81.0	Pass	≥40(-3)	
UGR	21.3		Pass	<22	



2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93782 (0%,3500K)	Total Operating Time(min)	75

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.0	60.01	0.3394	40.53	0.9949	6.27
NB-A1	277.0	60.01	0.1515	40.33	0.9610	14.01

**Photometric Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS–
 Goniophotometer Method(Test Distance: 26.00m):**

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6081.0	6021.6
Luminous Efficacy (lm/W)	150.03	149.32
Zonal lumens in the 0-60° zone (%)	81.0	--
Beam Angle (°)	117.8	--
Center Beam Candle Power (cd)	2079	--
UGR Viewed Crosswise	21.3	--
UGR Viewed Endwise	19.8	--



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,645.8	27.1%
0-40	2,723.9	44.8%
0-60	4,924.1	81%
60-90	1,147.0	18.9%
70-100	341.2	5.6%
90-120	4.3	0.1%
0-90	6,071.0	99.8%
90-180	9.4	0.2%
0-180	6,080.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	%Total
0-10	197.5	3.2%	90-100	1.5	0%
10-20	570.7	9.4%	100-110	1.3	0%
20-30	877.6	14.4%	110-120	1.5	0%
30-40	1,078.1	17.7%	120-130	1.2	0%
40-50	1,143.6	18.8%	130-140	1.2	0%
50-60	1,056.5	17.4%	140-150	1.0	0%
60-70	807.2	13.3%	150-160	0.8	0%
70-80	301.0	4.9%	160-170	0.6	0%
80-90	38.8	0.6%	170-180	0.2	0%

Photometric Data

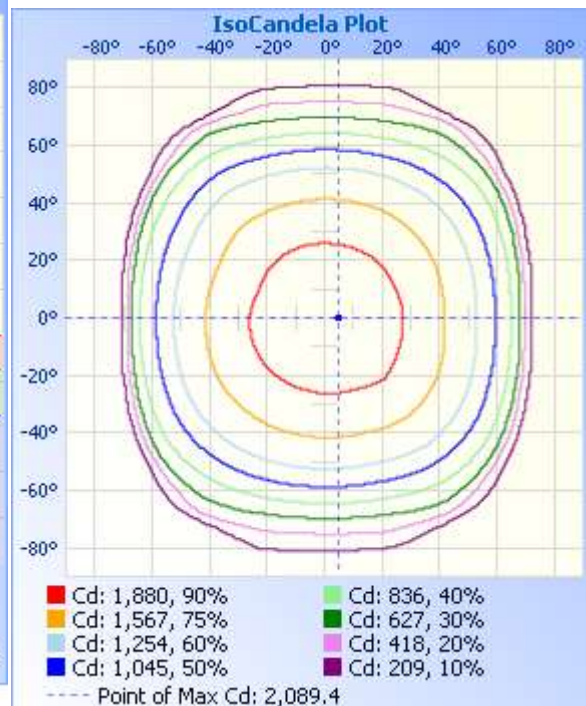
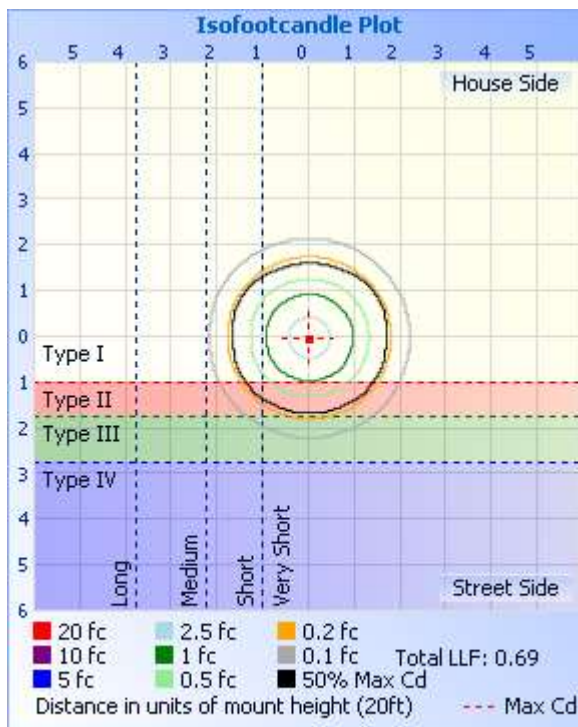
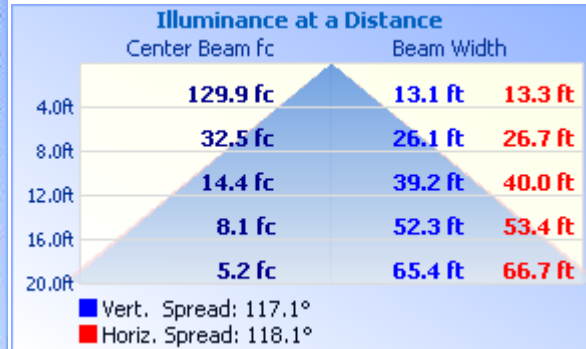
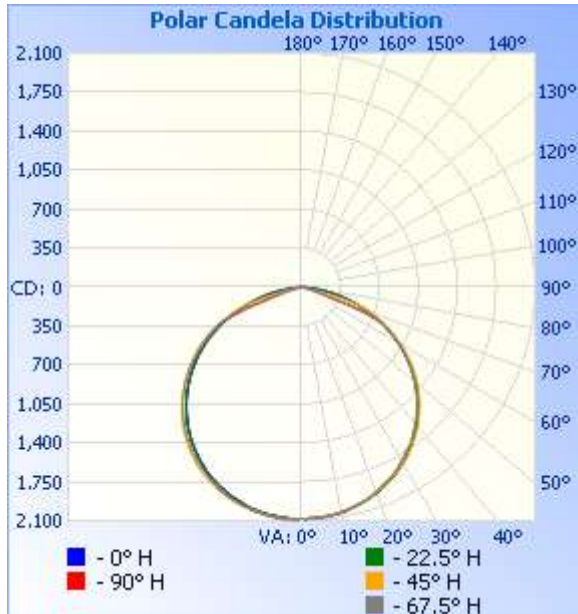




Table--1

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	2079	2079	2079	2079	2079	2079	2079	2079	2079	2079	2079	2079	2079	2079	2079	2079			
5	2089	2077	2075	2075	2076	2072	2073	2075	2072	2076	2073	2074	2071	2074	2082	2086			
10	2068	2057	2055	2061	2056	2051	2054	2051	2058	2056	2048	2051	2053	2059	2066	2061			
15	2034	2022	2013	2023	2014	2019	2014	2014	2020	2021	2018	2010	2014	2019	2039	2033			
20	1988	1963	1972	1974	1970	1966	1958	1954	1971	1966	1962	1956	1960	1972	1995	1986			
25	1918	1903	1906	1900	1902	1903	1899	1884	1900	1907	1893	1892	1893	1899	1934	1917			
30	1821	1822	1825	1821	1818	1818	1824	1802	1825	1822	1810	1806	1810	1814	1863	1839			
35	1713	1723	1722	1722	1722	1719	1731	1707	1729	1728	1714	1706	1710	1716	1764	1745			
40	1597	1611	1614	1612	1607	1607	1628	1590	1610	1616	1598	1594	1595	1605	1655	1637			
45	1468	1489	1490	1481	1479	1485	1502	1465	1485	1490	1466	1462	1463	1472	1524	1513			
50	1327	1352	1345	1339	1335	1337	1362	1328	1340	1348	1325	1318	1320	1325	1378	1373			
55	1180	1197	1186	1179	1179	1176	1206	1174	1183	1191	1166	1157	1161	1168	1217	1217			
60	1011	1031	1024	1008	1008	1006	1036	1006	1012	1017	997	985	987	994	1037	1047			
65	819	850	842	826	822	824	854	824	831	833	814	799	796	809	850	862			
70	314	545	655	640	632	637	661	465	274	496	621	605	602	614	653	512			
75	67.6	113	355	449	438	445	225	58.3	40.9	71.8	315	415	410	424	275	107			
80	15.3	15.6	44.5	267	255	262	20.7	15.2	16.2	14.7	32.4	237	227	241	28.7	16.1			
85	12.9	13.1	11.7	30.1	102	15.7	12.0	12.9	13.9	12.4	11.2	25.0	83.0	16.1	11.5	13.5			
90	0.03	1.09	3.07	4.33	6.98	4.45	2.31	0.27	0.31	0.36	3.05	4.61	4.33	4.48	2.47	0.40			
95	0.00	0.55	2.00	1.85	3.13	1.87	1.13	0.00	0.00	0.05	1.94	2.03	1.70	2.17	1.64	0.22			
100	0.00	0.21	0.78	1.38	3.59	1.21	0.44	0.00	0.24	0.37	0.81	1.51	2.86	1.71	0.89	0.38			
105	0.21	0.65	0.68	1.36	3.79	1.16	0.44	0.32	0.64	0.68	0.94	1.69	3.79	1.97	1.12	0.95			
110	0.43	0.70	0.76	1.46	3.24	1.23	0.57	0.33	0.86	0.83	1.23	2.09	4.17	2.34	1.38	1.06			
115	0.51	0.68	1.11	1.48	2.65	1.46	0.68	0.43	1.02	0.99	1.36	2.11	3.87	2.34	1.67	1.25			
120	0.69	0.68	1.11	1.34	2.08	1.39	0.81	0.73	1.07	1.22	1.49	1.96	3.39	2.32	1.77	1.35			
125	0.75	0.73	1.11	1.26	1.29	1.31	1.02	0.73	1.07	1.28	1.49	1.84	2.40	1.91	1.83	1.46			
130	0.83	0.81	1.13	1.51	1.44	1.84	1.07	0.89	1.42	1.51	1.54	2.07	1.90	1.97	1.85	1.55			
135	0.88	0.91	1.13	1.51	1.04	1.89	1.10	1.14	1.42	1.51	1.56	2.34	1.66	2.42	1.88	1.63			
140	1.15	1.12	1.16	1.81	1.01	1.94	1.15	1.19	1.55	1.56	1.76	2.34	1.21	2.72	2.01	1.65			
145	1.20	1.20	1.21	1.91	1.11	1.97	1.33	1.19	1.58	1.62	1.92	2.34	1.24	2.75	2.19	1.76			
150	1.20	1.25	1.33	1.91	1.21	2.04	1.51	1.33	1.66	1.69	2.07	2.34	1.37	2.54	2.19	2.11			
155	1.33	1.36	1.44	1.94	1.41	2.04	1.72	1.60	1.84	1.83	2.19	2.34	1.54	2.24	2.29	2.30			
160	1.55	1.54	1.64	1.99	1.62	2.04	1.93	1.65	1.95	1.93	2.24	2.34	1.80	1.82	2.87	2.36			
165	1.95	1.98	2.06	2.11	1.85	2.62	2.11	2.11	2.11	2.11	2.29	2.34	2.28	1.89	3.16	2.58			
170	2.38	2.27	2.42	2.29	1.90	2.85	2.61	2.44	2.54	2.50	2.42	2.67	2.30	1.89	3.02	2.87			
175	2.70	2.37	2.67	2.29	1.90	2.85	2.76	2.47	2.88	2.74	2.39	2.67	2.30	1.89	2.92	2.90			
180	2.70	2.42	2.60	2.29	1.90	2.82	2.76	2.49	2.86	2.66	2.34	2.59	2.23	1.89	2.87	2.76			



2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93782 (0%,3500K)	Total Operating Time(min)	61

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.0	60	0.3429	40.94	0.9950	6.26
NB-A1	277.0	60	0.1530	40.73	0.9612	13.99

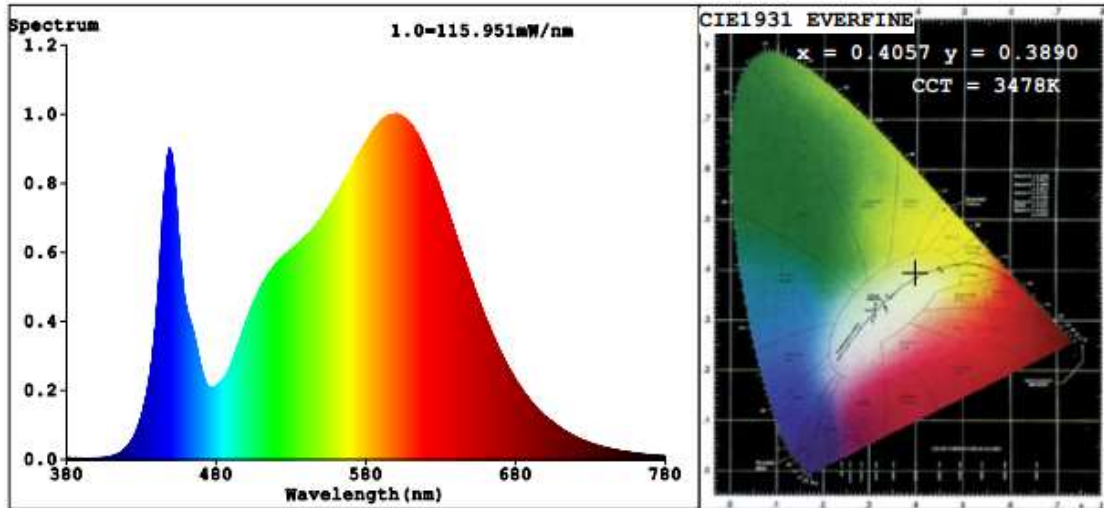
**Chromaticity Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS -
 Sphere-Spectroradiometer Method(Self-absorption:1.0875)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3478
Duv	-0.0008
Chromaticity (x, y)	x=0.4057 y=0.3890
Chromaticity (u', v')	u'=0.2367 v'=0.5106
Color Rendering Index (CRI)	82.6
R9	5
Rg	97
Rf	83
Rcs,h1(%)	-12

**Photometric Measurement in LITHONIA SERIES L2 32 MOVLT
 GEB10IS–Sphere-Spectroradiometer Method:**

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6148	6088
Luminous Efficacy (lm/W)	150.17	149.47

Spectral Power Distribution & Chromaticity Diagram



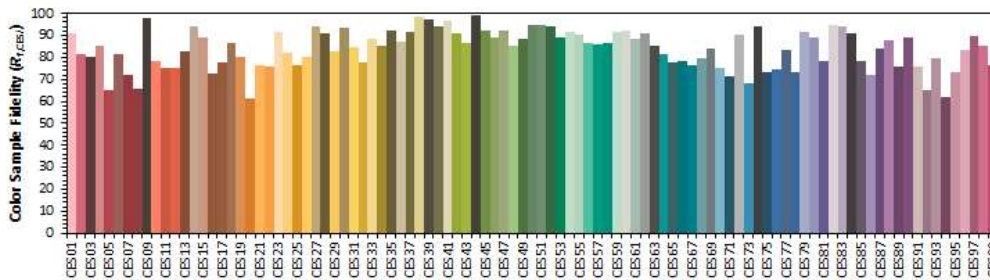
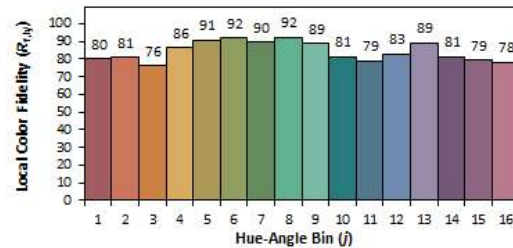
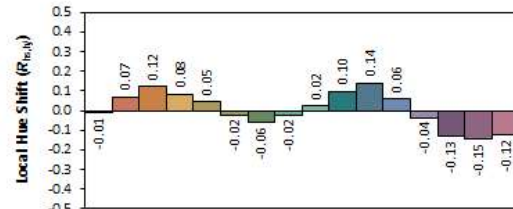
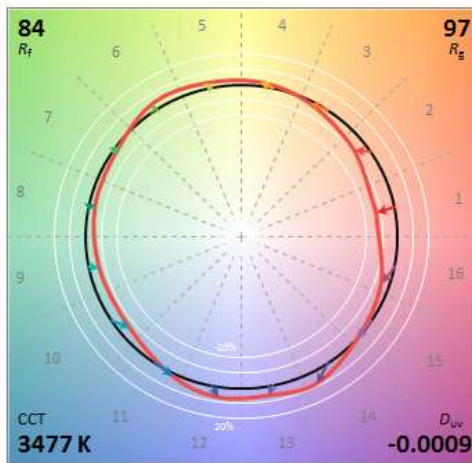
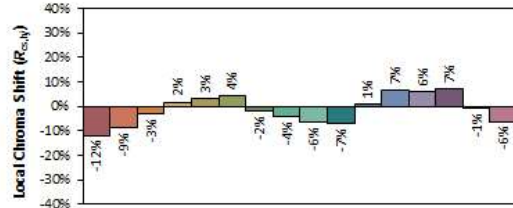
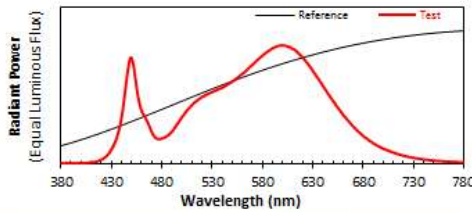
R1 =81	R2 =89	R3 =96	R4 =82	R5 =81	R6 =86	R7 =84		
R8 =61	R9 =5	R10=76	R11=81	R12=67	R13=83	R14=98	R15=74	



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: 01.JT.CC2835W80P03 Manufacturer: P.Q.L., Inc.
 Date: 2023-08-15 Model: 93782 (0%, 3500K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4057	CIE 13.3-1995 (CRI) R_A 83 R_g 5
y	0.3889	
u'	0.2367	
v'	0.5105	

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93782 (50%,4000K)	Total Operating Time(min)	61

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.0	60	0.3293	39.33	0.9952	6.25
NB-A1	277.0	60	0.1470	39.14	0.9614	13.97

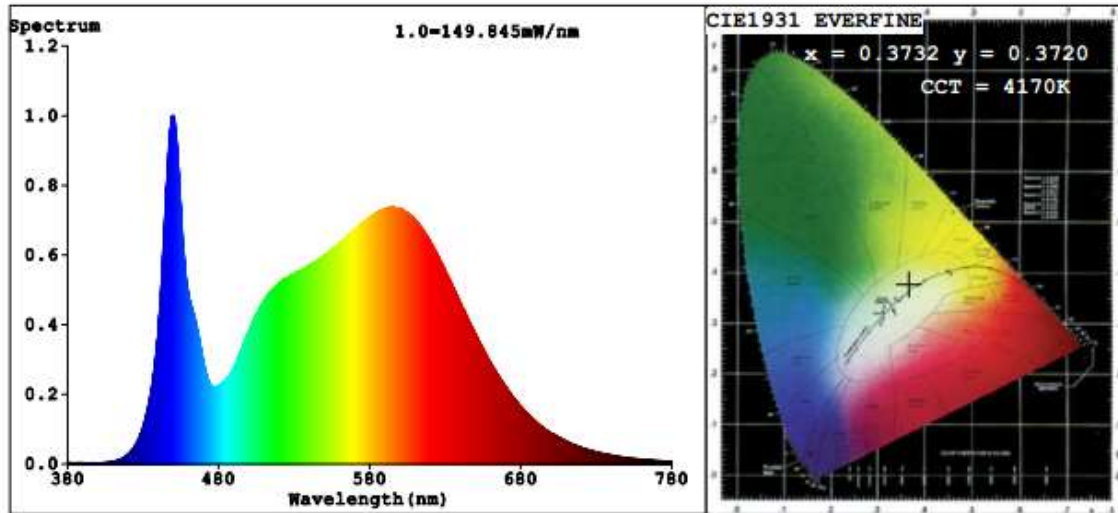
Chromaticity Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS - Sphere-Spectroradiometer Method(Self-absorption:1.0879)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4170
Duv	-0.0001
Chromaticity (x, y)	x=0.3732 y=0.3720
Chromaticity (u', v')	u'=0.2222 v'=0.4984
Color Rendering Index (CRI)	84.2
R9	13
Rg	96
Rf	84
Rcs,h1(%)	-12

Photometric Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6473	6410
Luminous Efficacy (lm/W)	164.58	163.77

Spectral Power Distribution & Chromaticity Diagram



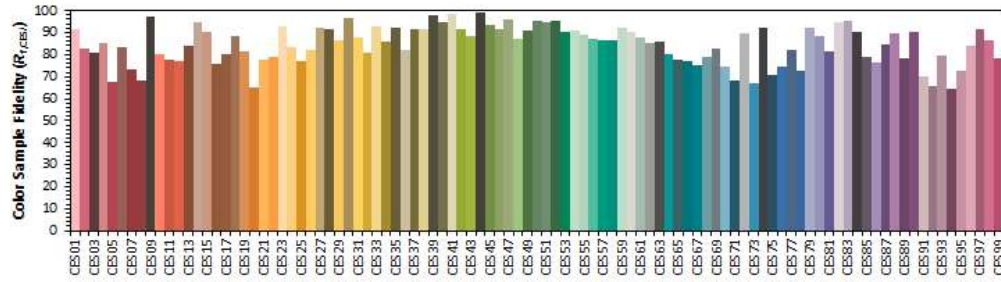
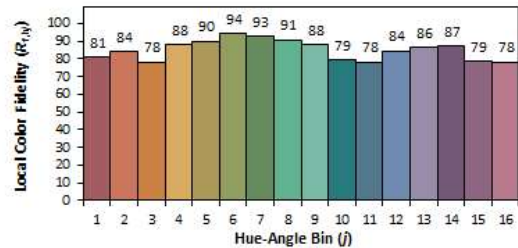
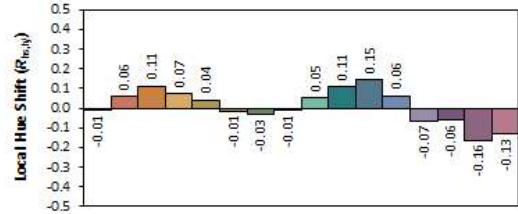
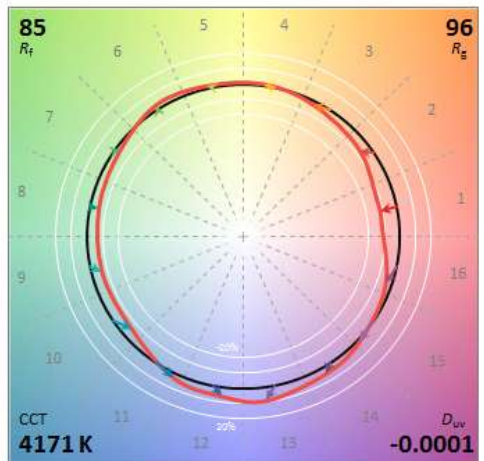
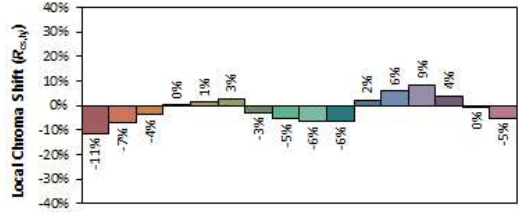
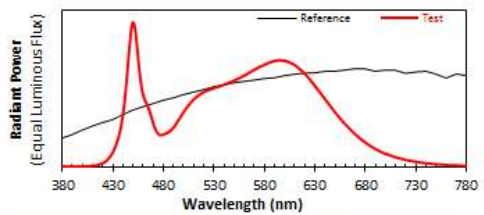
R1 =83	R2 =90	R3 =95	R4 =84	R5 =83	R6 =86	R7 =87	
R8 =67	R9 =13	R10=76	R11=84	R12=63	R13=85	R14=97	R15=77



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: 01.JT.CC2835W80P03 Manufacturer: P.Q.L., Inc.
 Date: 2023-08-15 Model: 93782 (50%, 4000K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3731	CIE 13.3-1995 (CRI) R_a 84 R_g 13
y	0.3718	
u'	0.2223	
v'	0.4983	

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93782 (100%,5000K)	Total Operating Time(min)	61

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.0	60	0.3478	41.52	0.9948	6.28
NB-A1	277.0	60	0.1552	41.31	0.9611	14.00

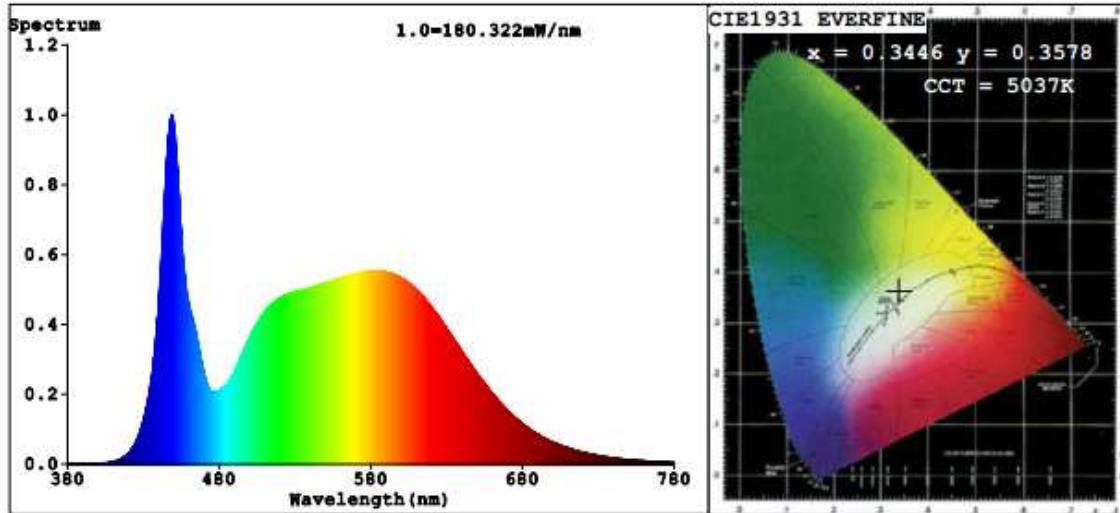
Chromaticity Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS - Sphere-Spectroradiometer Method(Self-absorption:1.0871)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5037
Duv	0.0032
Chromaticity (x, y)	x=0.3446 y=0.3578
Chromaticity (u', v')	u'=0.2087 v'=0.4876
Color Rendering Index (CRI)	83.2
R9	8
Rg	96
Rf	84
Rcs,h1(%)	-12

Photometric Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6387	6325
Luminous Efficacy (lm/W)	153.83	153.11

Spectral Power Distribution & Chromaticity Diagram



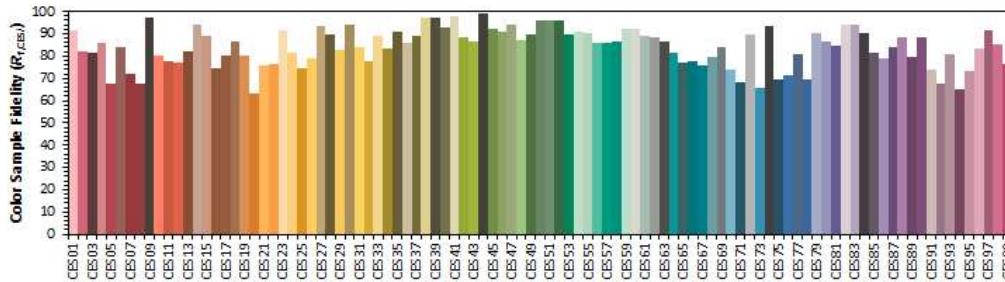
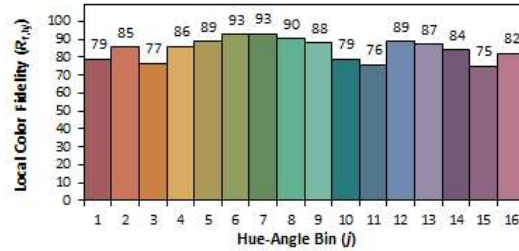
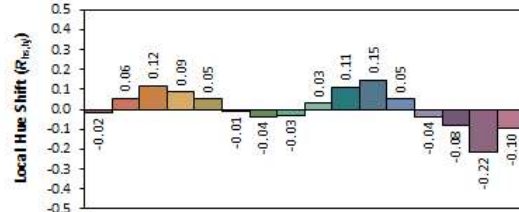
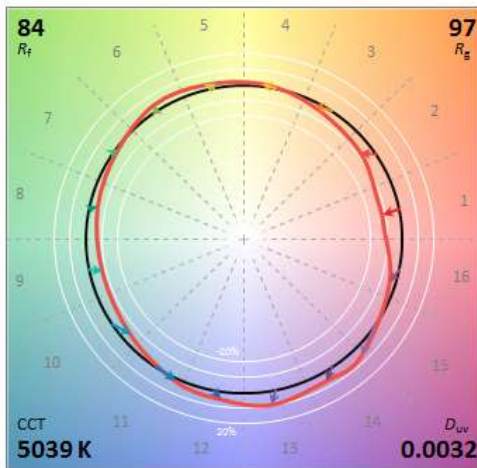
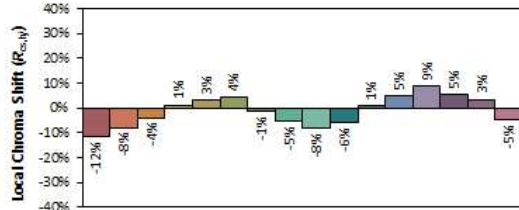
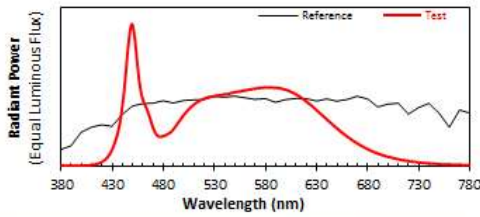
R1 =81	R2 =87	R3 =92	R4 =84	R5 =83	R6 =83	R7 =87		
R8 =68	R9 =8	R10=71	R11=84	R12=63	R13=83	R14=96	R15=76	



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: 01.JT.CC2835W80P03 Manufacturer: P.Q.L., Inc.
 Date: 2023-08-15 Model: 93782 (100%, 5000K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3446
 y 0.3576
 u' 0.2088
 v' 0.4875

CIE 13.3-1995 (CRI)
 R_a 83
 R_g 8

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.5 Data comparison for different power

Test date	2023-08-15	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93782	Total Operating Time(min)	61

Sample No.	Wattage and CCT setting	Test Voltage (V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
STD230824NB-A1	20W,3500K setting	120	3320	20.31	163.47
STD230824NB-A1	30W,3500K setting	120	4855	31.21	155.56
STD230824NB-A1	40W,3500K setting	120	6081.0	40.53	150.03



3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-703	Standard Lamp D204	2022-12-29	2023-12-28
ST-R-704	Power Meter for Integrating Sphere	2022-12-29	2023-12-28
ST-R-707	Temperature Probe for Integrating Sphere	2023-01-03	2024-01-02
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp D908S	2022-12-29	2023-12-28
ST-R-711	Power Meter for Goniophotometer	2022-12-29	2023-12-28
ST-R-709	Hygrothermograph for Goniophotometer	2023-01-03	2024-01-02
Uncertainty(K=2): Photometric Measurement (Sphere):3.40% Chromaticity Measurement(Sphere):44.8K Photometric Measurement(Goniophotometer):3.64%			

4. Product Photo



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