

PUREEDGE LIGHTING LLC

TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

CFMW-7W-***-48-**K-**

PROJECT NUMBER

G104797632

REPORT NUMBER

104797632CHI-042

ISSUE DATE

7/21/2022

REVISED DATE

None

TEST DATES

2022-07-05 through 2022-07-21.

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104797632CHI-042

MODEL NUMBER(s)

CFMW-7W-***-48-**K-**

REPORT RENDERED TO:

PUREEDGE LIGHTING LLC
1718 W. FULLERTON AVE
CHICAGO, IL 60614
USA

STATEMENT OF LIMITATION

NVLAP Lab Code 600186-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01199885-2.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI/IES LM-79-19 Optical and Electrical Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

ANSI/UL 1598-2018: Standard for Safety - Luminaires

IES TM-30-18: IES Method for Evaluating Light Source Color Rendition

In Charge of Testing:



Maximilian Carvajal
Engineer
Lighting Division

Reviewer:



Jeff Davis
N.A. Technical Lead
Lighting Division

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SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	AH05192022111730	CFMW-7W-***-48-**K-**	LINEAR LOW VOLTAGE	Production	5/19/2022

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	CFMW-7W-***-48-**K-**	1

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	CFMW-7W-***-48-***K-***
Product Description:	LINEAR LOW VOLTAGE
LED Model No.:	Lumileds 2835
Driver Model No.:	Magnitude Lighting / CVD96R24DC
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	3151.6	3124.2
Input Power (W) @ 120 (Vac)	53.21	52.60
Lumen Efficacy (lm/W)	59.2	59.4
Input Power Factor (I) @ 120 (Vac)	0.995	0.996

Criteria	Results
Input ATHD (%) @ 120 (Vac)	5.71
Correlated Color Temperature (K)	3422
Color Rendering Index - Ra (I)	92.0
Color Rendering Index - R9 (I)	54.1
Duv (I)	-0.0011
Chromaticity Coordinate (x)	0.409
Chromaticity Coordinate (y)	0.390
Chromaticity Coordinate (u')	0.238
Chromaticity Coordinate (v')	0.511
Max LED Source Temperature (°C)	68.5
Max Driver Case Temperature (°C)	44.1
Input Power (W) @ 277 (Vac)	51.75
Input Power Factor (I) @ 277 (Vac)	0.870
Input ATHD (%) @ 277 (Vac)	8.42

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TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

INSITU TEMPERATURE MEASUREMENT TESTING

Thermal measurements were taken on the EUT using a thermocouple and temperature meter. The EUT was allowed to reach thermal equilibrium for three and a half to seven and a half hours before measurements were taken. Temperatures were measured at the TMPps or Ts point as indicated by the included diagram in accordance with manufacturers declared thermal test point location, or at a thermal test point location found with a thermal camera when no diagram from the manufacturer is given. The maximum temperature was recorded for the sample. A simulated ceiling or other enclosure may be used in accordance to UL 1598, UL 153, or UL 1993 as applicable.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	CFMW-7W-***-48-**K-**	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

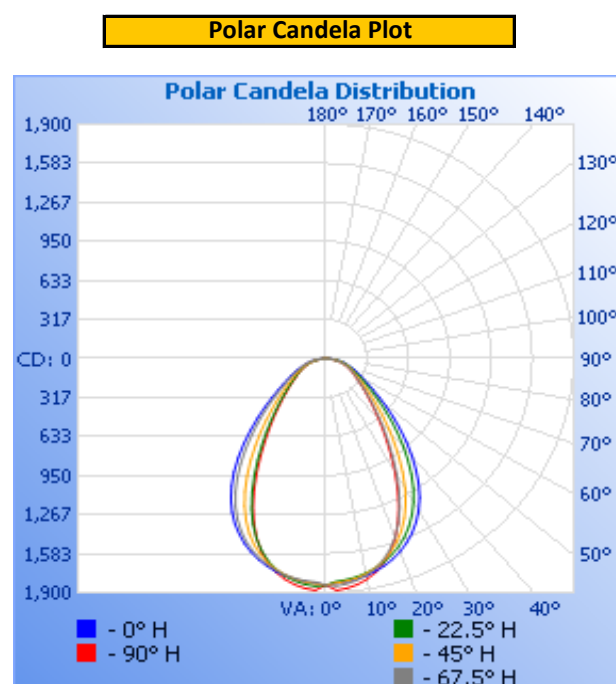
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	119.97	445.8	53.21	0.995

Light Output (lm)	Lumen Efficacy (lm/W)
3151.6	59.2

INTENSITY SUMMARY - CANDELA

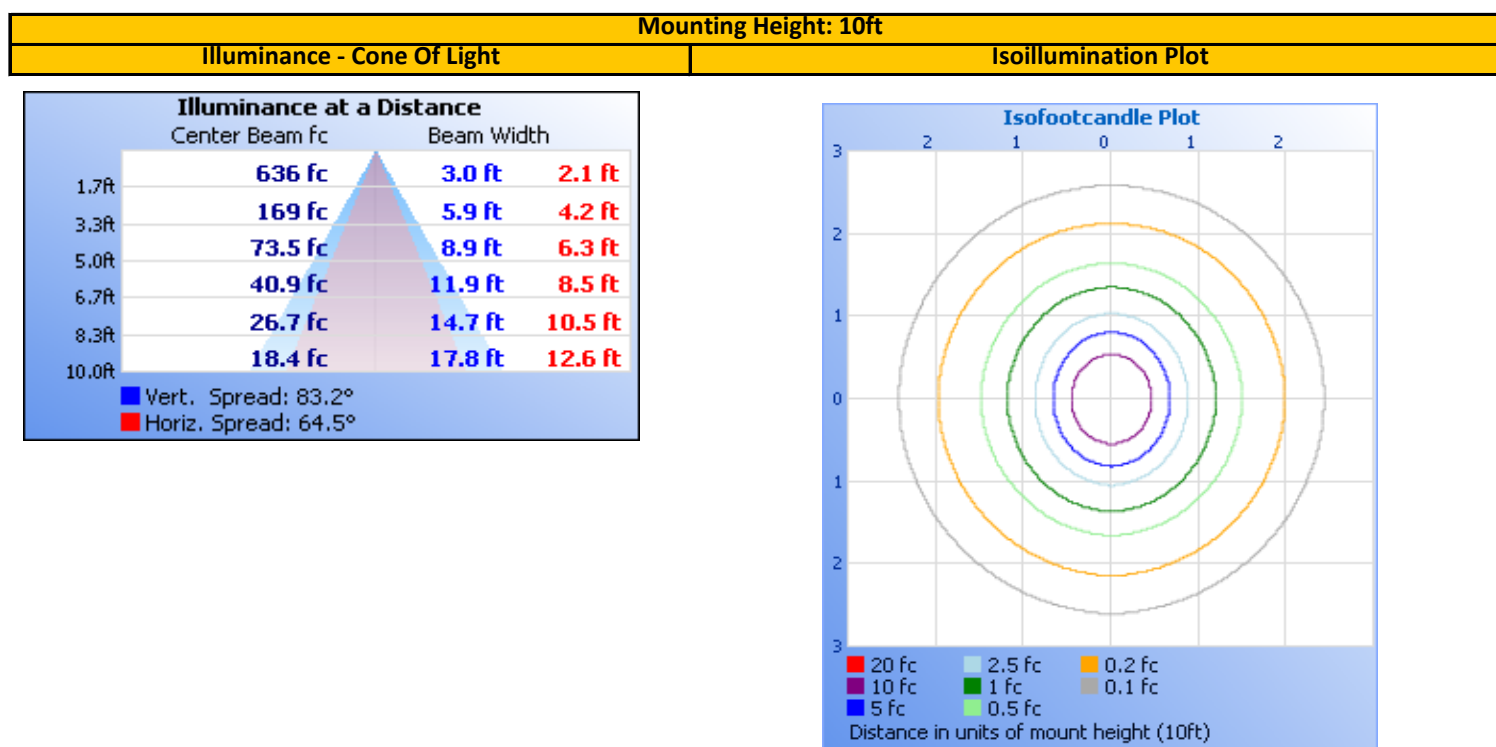
Angle	0	22.5	45	67.5	90
0	1837.6	1837.6	1837.6	1837.6	1837.6
5	1815.4	1801.9	1813.1	1833.7	1870.2
10	1786.7	1767.2	1772.3	1784.9	1817.4
15	1738.4	1709.9	1698.8	1693.4	1715.7
20	1664.8	1624.6	1585.6	1545.7	1550.4
25	1561.4	1505.0	1424.9	1336.6	1320.5
30	1422.7	1343.5	1213.2	1085.6	1056.2
35	1239.0	1142.5	976.4	842.1	813.3
40	1023.6	917.0	757.1	642.4	620.1
45	800.0	704.8	572.0	491.1	476.8
50	603.9	528.2	436.3	382.6	374.9
55	443.2	397.3	339.3	305.4	300.9
60	336.6	306.5	270.6	249.3	246.0
65	262.7	241.7	218.8	203.9	202.0
70	203.9	190.8	174.8	163.4	161.6
75	155.6	145.3	133.1	123.5	121.7
80	108.1	98.7	88.8	80.6	79.0
85	55.2	47.2	38.5	32.4	31.4
90	0	0	0	0	0
95	0	0	0	0	0
100	0	0	0	0	0
105	0	0	0	0	0
110	0	0	0	0	0
115	0	0	0	0	0
120	0	0	0	0	0
125	0	0	0	0	0
130	0	0	0	0	0
135	0	0	0	0	0
140	0	0	0	0	0
145	0	0	0	0	0
150	0	0	0	0	0
155	0	0	0	0	0
160	0	0	0	0	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

Entire luminous intensity matrix found in .IES file



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	1,309.1	41.5%	0-10	172.9	5.5%
0-40	1,938.0	61.5%	10-20	480.5	15.2%
0-60	2,736.9	86.8%	20-30	655.7	20.8%
60-90	414.8	13.2%	30-40	628.9	20.0%
70-100	189.1	6.0%	40-50	474.3	15.0%
90-120	0.0	0.0%	50-60	324.6	10.3%
0-90	3,151.6	100.0%	60-70	225.7	7.2%
90-180	0.0	0.0%	70-80	143.4	4.6%
0-180	3,151.6	100.0%	80-90	45.7	1.4%
			90-100	0.0	0.0%
			100-110	0.0	0.0%
			110-120	0.0	0.0%
			120-130	0.0	0.0%
			130-140	0.0	0.0%
			140-150	0.0	0.0%
			150-160	0.0	0.0%
			160-170	0.0	0.0%
			170-180	0.0	0.0%

INTEGRATING SPHERE TESTING

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	CFMW-7W-***-48-**K-**	NA

PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

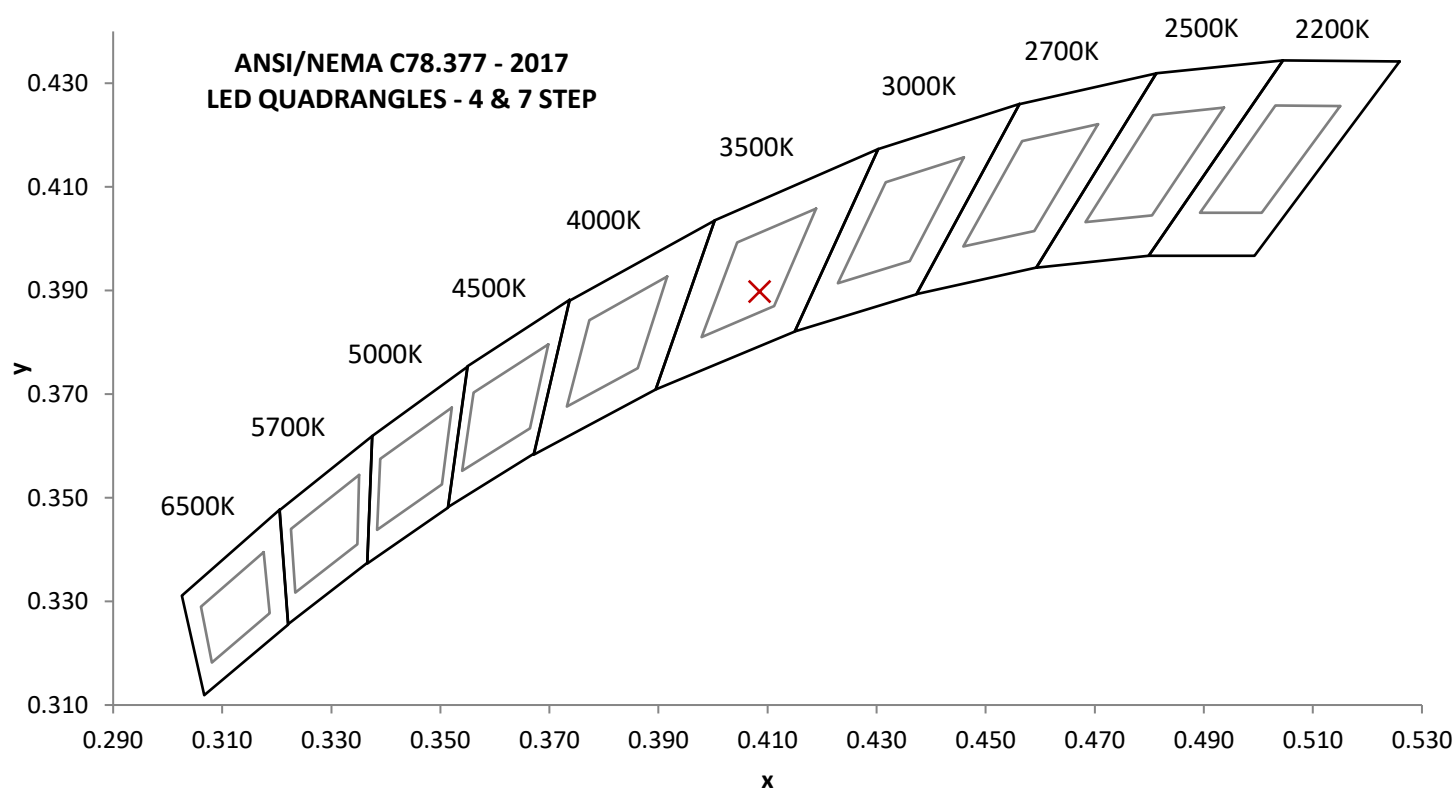
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.04	439.9	52.60	0.996	5.71
276.96	214.8	51.75	0.870	8.42

Measured at 120.04(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
3124.2	59.4	3422	92.0	54.1

Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
-0.0011	0.409	0.390	0.238	0.511

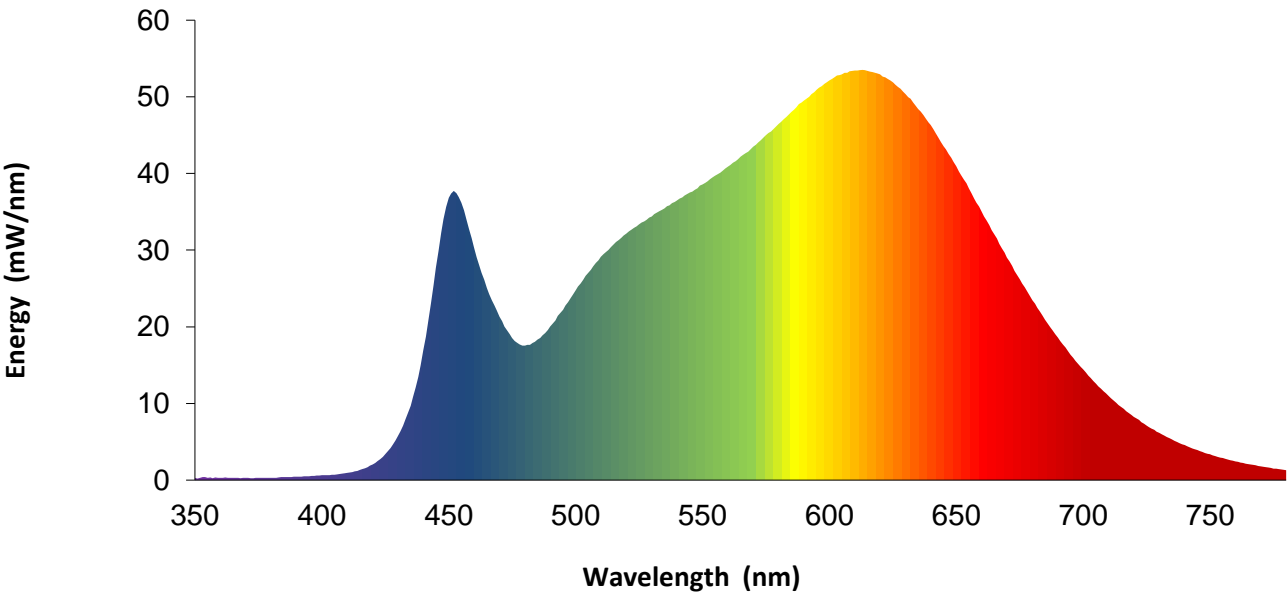


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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.3		460	30.4		570	43.5		680	23.5
355	0.3		465	25.1		575	45.0		685	20.9
360	0.3		470	21.3		580	46.5		690	18.6
365	0.3		475	18.6		585	48.0		695	16.3
370	0.3		480	17.5		590	49.5		700	14.4
375	0.3		485	18.3		595	50.9		705	12.6
380	0.3		490	20.0		600	52.2		710	11.0
385	0.4		495	22.2		605	53.0		715	9.5
390	0.4		500	24.8		610	53.4		720	8.2
395	0.5		505	27.1		615	53.4		725	7.1
400	0.6		510	29.1		620	52.9		730	6.2
405	0.7		515	30.8		625	51.9		735	5.3
410	0.9		520	32.2		630	50.3		740	4.6
415	1.3		525	33.4		635	48.4		745	3.9
420	2.1		530	34.4		640	46.3		750	3.4
425	3.4		535	35.4		645	43.6		755	2.9
430	5.7		540	36.5		650	41.0		760	2.4
435	9.7		545	37.5		655	38.1		765	2.1
440	16.9		550	38.6		660	35.0		770	1.8
445	27.7		555	39.7		665	32.0		775	1.5
450	36.9		560	40.9		670	29.0		780	1.3
455	36.2		565	42.2		675	26.2		---	---

Without correction of sample absorption.



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

INSITU TEMPERATURE MEASUREMENT TESTING

REPORT NO. 104797632CHI-042

Test Configuration	Tested Model No.	Pass/Fail/NA
1	CFMW-7W-***-48-**K-**	NA

LED MEASUREMENTS AND RATINGS

Mounting Type	Input Voltage (Vac)
Ceiling Surface	120.00

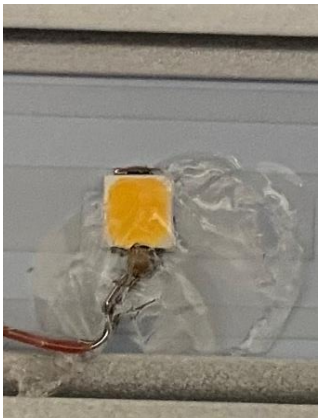
LED Model No.	Lumileds 2835
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Max Junction Temp - Tj (°C)	Max Thermal Resistance - Rth (°C/W)	Max Forward Voltage - Vf (V)
125.0	21.0	3.2

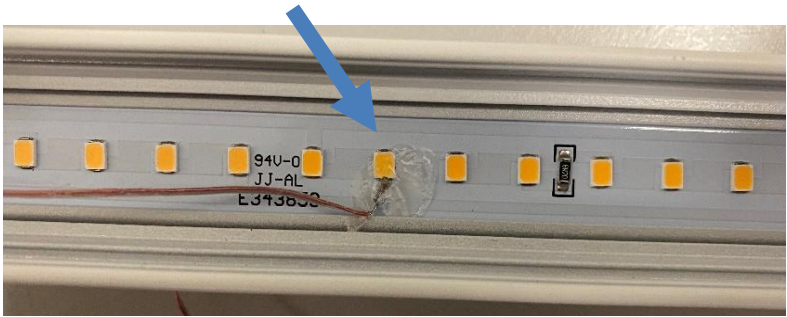
Measured LED Current (mA)	Measured LED Temp - Ts (°C)	Max LED Temp - Ts Max (°C)
105.8	68.5	117.9

Max LED Temp = Max Junction Temp – (LED Wattage x Thermal Resistance)

ISTMT Photo - Ts



ISTMT Photo - Ts Location



LED SOURCE MANUFACTURER'S SUPPORTING DOCUMENTATION

LED Junction Temperature^[1] (DC & Pulse)

115°C for L128-xxxxEA3500001
125°C for L128-xxxxCx35000x1
125°C for L128-xxxxNA35000x1
125°C for L128-xxxxHA35000x1

Table 3. Electrical and thermal characteristics for LUXEON 2835 Architectural at specified test current, T_a=25°C.

PART NUMBER	FORWARD VOLTAGE ^[1] (V _f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE ^[2] (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L128-xxxxEC3500001	8.4	8.9	9.9	-3.0 to -6.0	15
L128-xxxxEC35000B1	8.7	9.3	9.9	-3.0 to -6.0	15
L128-xxxxEB3500001	5.8	6.1	6.6	-2.0 to -4.0	20
L128-xxxxEA3500001	2.7	2.9	3.1	-1.0 to -2.0	39
L128-xxxxCB3500001	5.8	6.0	6.6	-2.0 to -4.0	11
L128-xxxxCA35000x1	2.9	3.0	3.2	-1.0 to -2.0	21
L128-xxxxNA35000x1	2.68	2.75	2.88	-1.0 to -2.0	14
L128-xxxxHA35000B1	2.66	2.71	2.76	-1.0 to -2.0	10

Notes for Table 3:
1. Pulse width = 100µs, duty cycle = 10%
2. Measured at T_a = 25°C

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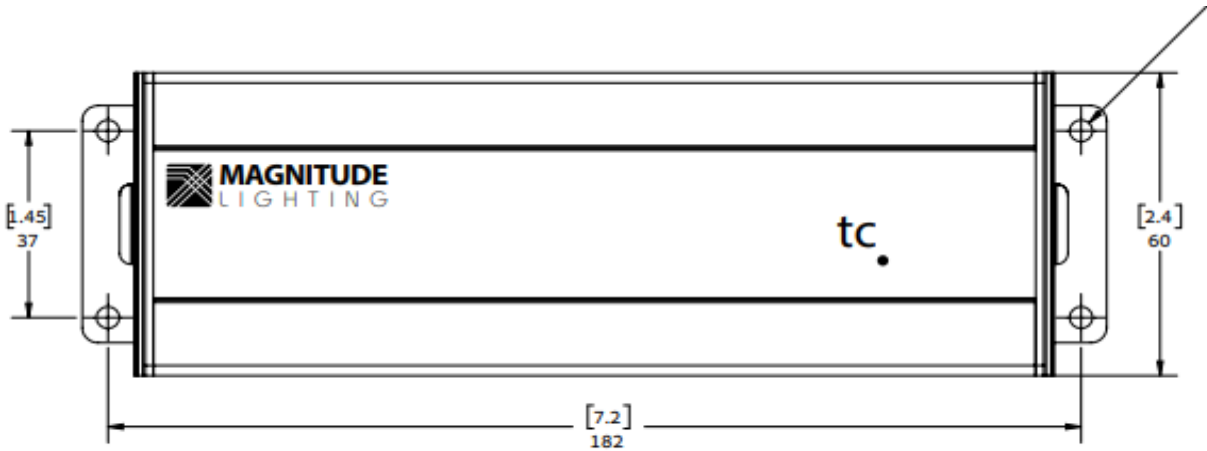
DRIVER MEASUREMENTS AND RATINGS

Measured Case Temp - Td (°C)	Max Case Temp (°C)
44.1	65.0

ISTMT Photo - Td



DRIVER MANUFACTURER'S SUPPORTING DOCUMENTATION



Environmental Specification	
Env. Protection Rating	IP65
Operating Ambient temperature	-25°C - +40°C
Max Case Temp. (Tcase)	65°C for a 5 year warranty
Storage temperature	-40°C - +85°C
Expected life time	50K Hours (> 65°C) Tc
Audible Noise	> 24db Class A

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Yokogawa Power Meter	WT310E	CHI0664	3/30/2022	3/30/2023
2	Omega Thermometer	DPI8-C24	146920	10/4/2021	10/4/2022
3	LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
4	Newport Thermohygrometer	iServer	CHI0452	2/3/2022	2/3/2023
5	Chroma Power Supply	61604	CHI0371	VBU	VBU
8	Newport Humidity Recorder	iServer	146961	9/21/2021	9/21/2022
9	Labsphere Spectroradiometer	CDS2600	CHI0539	VBU	VBU
10	3 Meter Sphere	SPR600	CHI0088	VBU	VBU
11	Elgar AC Power Supply	CW1251	146112	VBU	VBU
12	Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
13	Yokogawa Power Meter	WT1600	146767	4/4/2022	4/4/2023
17	Omega thermometer	USB TC08	EQAH002615	4/5/2022	4/5/2023
26	Xitron Power Analyzer	XT-2640	CHI0611	7/6/2022	7/6/2023
27	Yokogawa Power Analyzer	WT210	146761	7/1/2022	7/1/2023
28	Agilent Datalogger	34970A	146441	10/1/2021	10/1/2022
29	Staco Variac	3PN2210B	146360	VBU	VBU
30	Extech Thermohygrometer	SD700	146965	10/14/2021	10/14/2022

Note: Standard sources listed above are traceable to NIST: National Institute of Standards and Technology

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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Test Configuration	Tested Model No.	Pass/Fail/NA
1	CFMW-7W-***-48-**K-**	NA

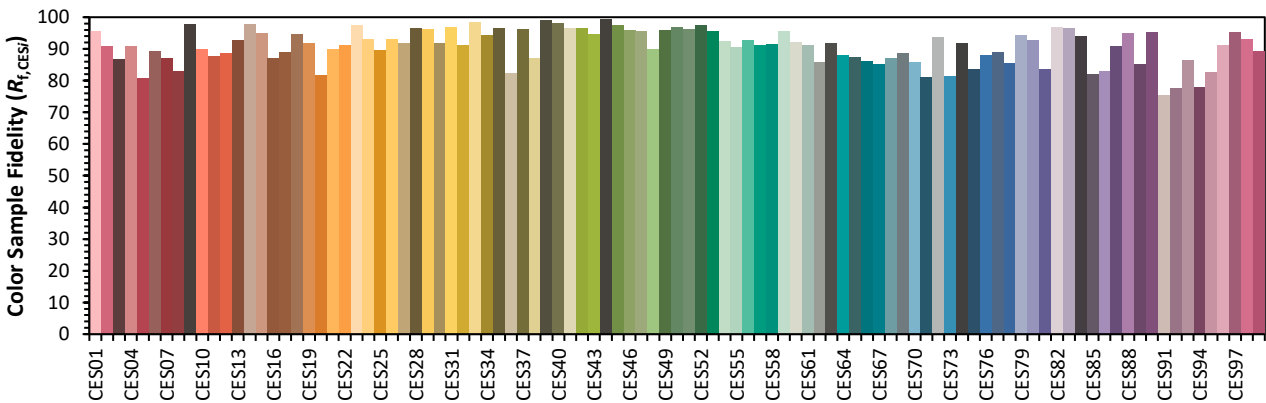
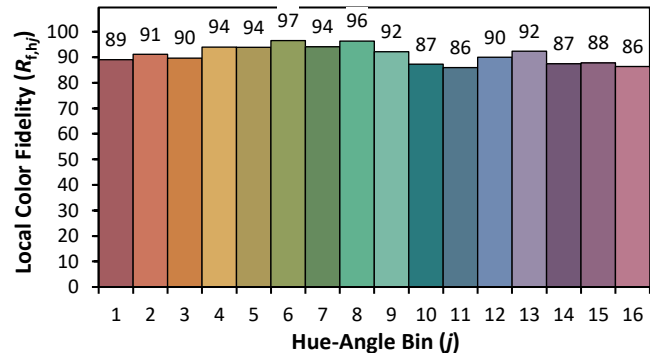
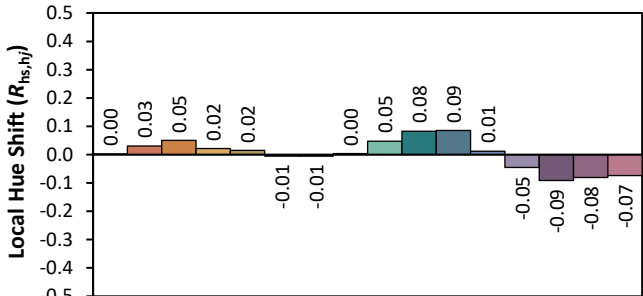
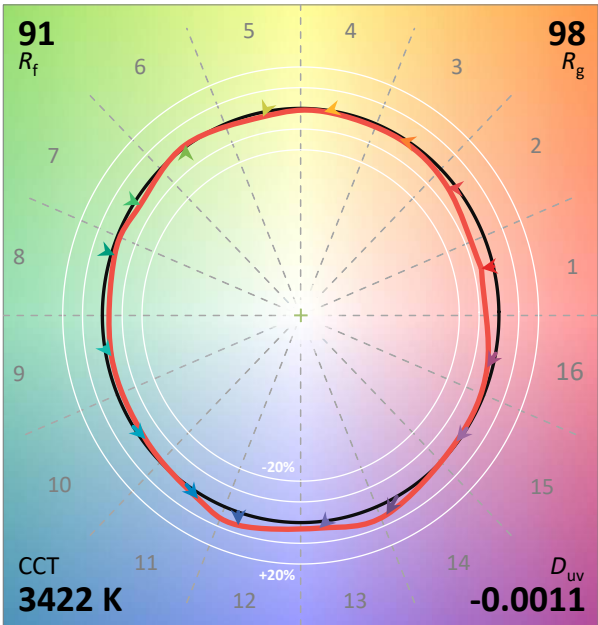
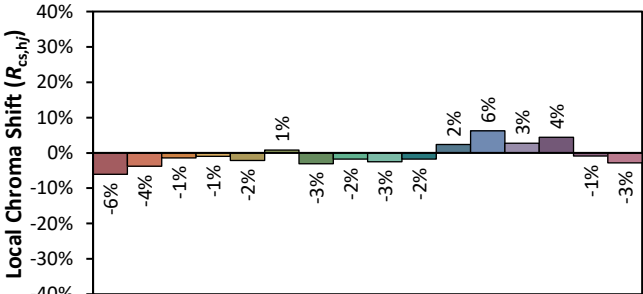
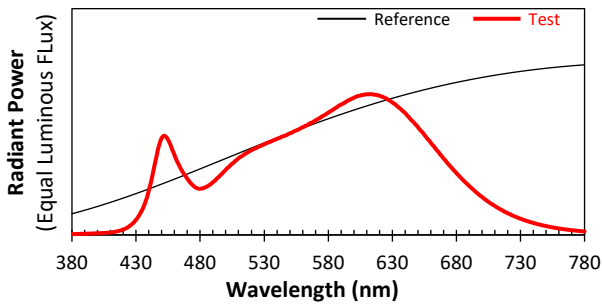
ANSI/IES TM-30-18 Color Rendition Report

Source: User SPD

Date: 7/5/2022

Manufacturer: PureEdge Lighting LLC

Model: CFMW-7W-***-48-**K-**



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

x 0.4085

y 0.3897

u' 0.2382

v' 0.5113