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## Photometric Test Report

Relevant Standards  
IES LM-79-2008, ANSI C82.77-2002, UL 1598-2008  
CIE 13.3-1995, CIE 15-2004, ANSI C78.377-2015  
IES TM-30-2015

Prepared For  
**TechBrite LLC**  
1000 Kieley Pl  
Cincinnati, OH 45217  
United States

Catalog Number  
**LB2204SS1B3BFXXX**  
Order Number  
11937991  
Test Number  
11937991.08

Test Date

2017-09-09 - 2017-09-17

Prepared By

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Approved By

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The results contained in this report pertain only to the tested sample.  
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Laboratory results may not be representative of field performance  
Ballast factors have not been applied

Testing was performed in a 2-meter integrating sphere using the  $4\pi$  geometry method.  
Absorption correction was employed for Sphere measurement



**Luminaire Description:** White formed steel housing, no lens enclosure  
**Lamp:** 224 white LEDs  
**Mounting:** Pendant  
**Ballast/Driver:** One Universal Lighting Technologies D15CC55UNVTW-C driver

**Luminaire**



**Luminaire Characteristics**

Luminous Length: 24.00 in.  
Luminous Width: 18.50 in.

**Summary of Results**

**Integrating Sphere**

Luminous Flux: 5129 Lumens  
Efficacy: 113.7 lm/w  
CCT: 3502 K  
CRI (Ra): 83.1

**Distribution**

Total Luminaire Output: 5130 Lumens  
Luminaire Efficacy: 113.9 lm/w  
Maximum Candela: 2150 Candela

**Electrical Data at 277 VAC**

Test Temperature: 25.8 °C  
Voltage: 277.0 VAC  
Current: 0.1663 A  
Power: 45.11 W  
Power Factor: 0.979  
Frequency: 60 Hz  
Current THD: 6.22 %

**In-Situ**

LED Temperature: 40.2 °C  
Driver Temperature: 38.6 °C  
Measured LED Current: 0.05050 A

Temperature is offset to an ambient temperature of 25°C as described in UL1598-2008.



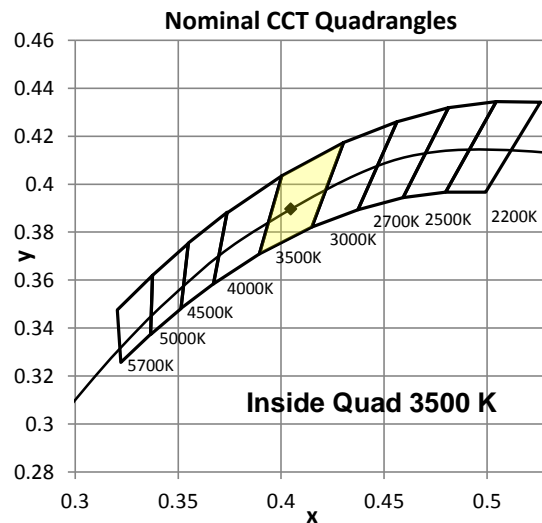
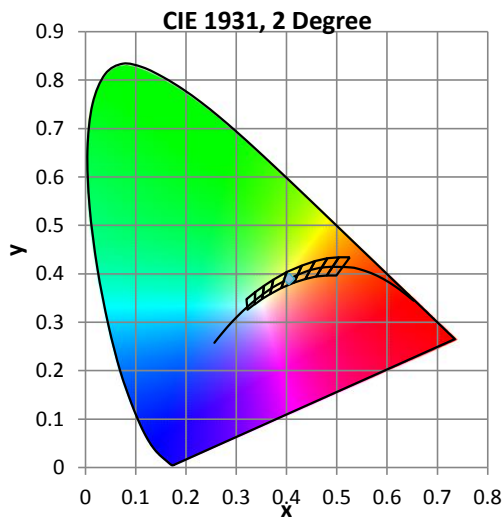
## Color Quality - Integrating Sphere

### Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.8 °C	120.0 VAC	0.3764 A	45.09 W	0.998	60 Hz	4.94 %

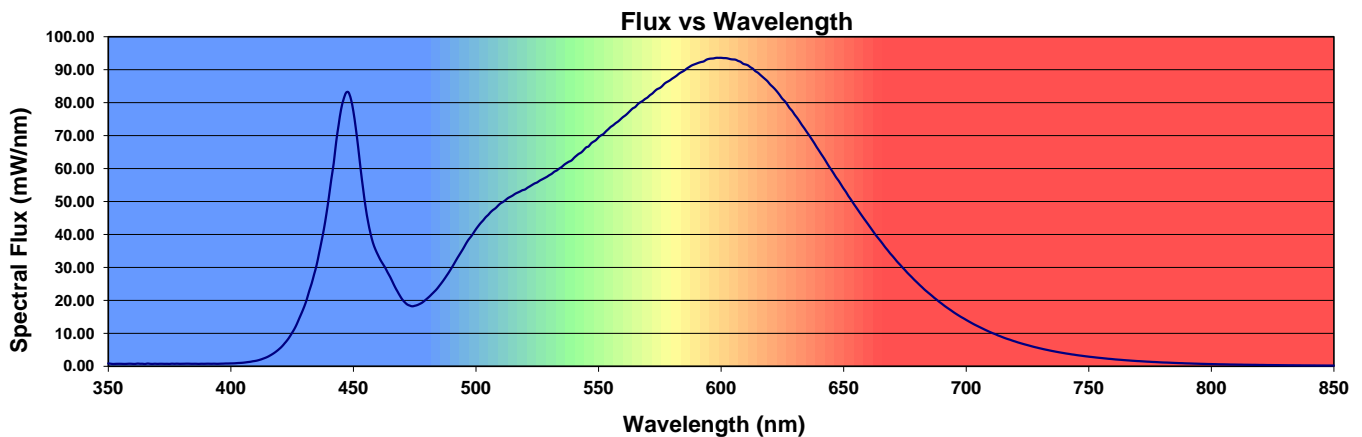
### Summary of Results

<b>Total Output:</b>	5129 Lumens	<b>Chromaticity (x):</b>	0.4047
<b>Efficacy:</b>	113.7 lm/w	<b>Chromaticity (y):</b>	0.3897
<b>CCT:</b>	3502 K	<b>Chromaticity (u'):</b>	0.2358
<b>CRI (Ra):</b>	83.1	<b>Chromaticity (v'):</b>	0.5108
<b>CRI (R9):</b>	12.1	<b>TM-30 Rf:</b>	82.6
<b>Peak Wavelength:</b>	598.4 nm	<b>TM-30 Rg:</b>	97.8
<b>Dominant Wavelength:</b>	581 nm	<b>Duv:</b>	0.0005
<b>S/P Ratio:</b>	1.516		



### Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
83.1	81.4	88.8	95.1	82.8	81.8	85.4	85.5	64.4	12.1	74.4	82.3	69.5	82.9	97.3





## Distribution - Goniophotometer

### Distribution Test Conditions

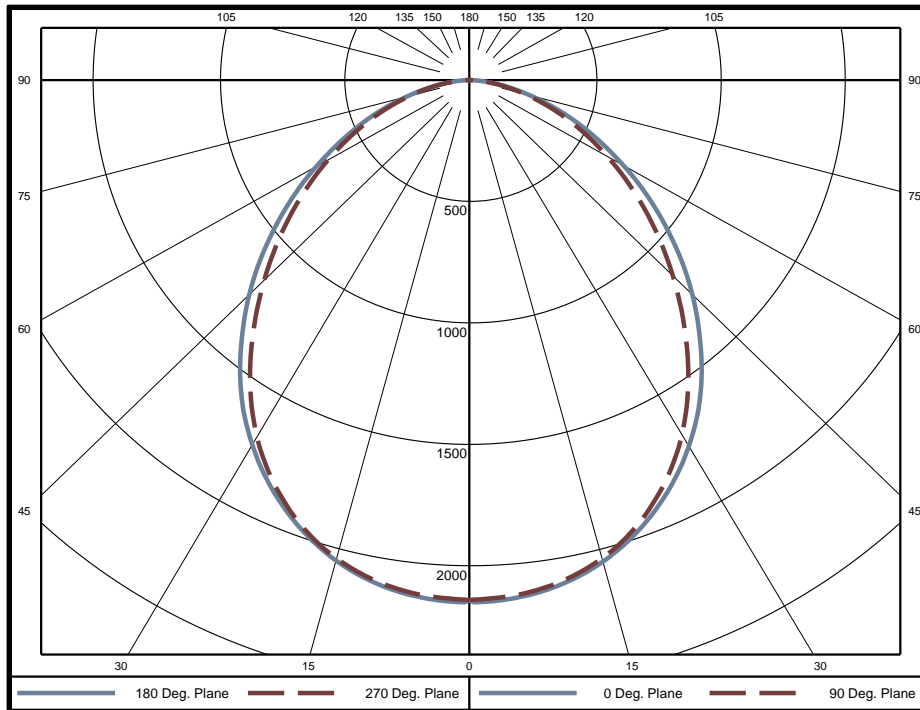
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.3 °C	120.0 VAC	0.3762 A	45.05 W	0.998	60 Hz	5.06 %

### Summary of Results

**Spacing Criteria**  
 0-180: 1.21  
 90-270: 1.18

**Total Lumen Output:** 5130 Lumens  
**Luminaire Efficacy:** 113.9 lm/w  
**Maximum Candela:** 2150 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	51.1	1.0%	60-65	287.8	5.6%	120-125	0	0.0%
5-10	151.4	3.0%	65-70	224.8	4.4%	125-130	0	0.0%
10-15	246.0	4.8%	70-75	161.4	3.1%	130-135	0	0.0%
15-20	330.3	6.4%	75-80	102.0	2.0%	135-140	0	0.0%
20-25	400.2	7.8%	80-85	51.0	1.0%	140-145	0	0.0%
25-30	452.5	8.8%	85-90	13.6	0.3%	145-150	0	0.0%
30-35	483.9	9.4%	90-95	0	0.0%	150-155	0	0.0%
35-40	492.2	9.6%	95-100	0	0.0%	155-160	0	0.0%
40-45	479.3	9.3%	100-105	0	0.0%	160-165	0	0.0%
45-50	449.1	8.8%	105-110	0	0.0%	165-170	0	0.0%
50-55	404.6	7.9%	110-115	0	0.0%	170-175	0	0.0%
55-60	349.3	6.8%	115-120	0	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	2608	50.8%
0-60	4290	83.6%
0-90	5131	100.0%
90-180	0	0.0%



**Candela Tabulation**  
Horizontal Angle (Degrees)

Vertical Angle (Degrees)	Horizontal Angle (Degrees)															
	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	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142	2142
5	2140	2132	2130	2130	2129	2130	2130	2132	2140	2132	2130	2130	2129	2130	2130	2132
10	2109	2101	2099	2099	2097	2099	2099	2101	2109	2101	2099	2099	2097	2099	2099	2101
15	2053	2046	2044	2042	2040	2042	2044	2046	2053	2046	2044	2042	2040	2042	2044	2046
20	1973	1965	1961	1957	1953	1957	1961	1965	1973	1965	1961	1957	1953	1957	1961	1965
25	1871	1862	1854	1844	1838	1844	1854	1862	1871	1862	1854	1844	1838	1844	1854	1862
30	1746	1737	1723	1704	1695	1704	1723	1737	1746	1737	1723	1704	1695	1704	1723	1737
35	1602	1589	1566	1537	1524	1537	1566	1589	1602	1589	1566	1537	1524	1537	1566	1589
40	1435	1420	1387	1354	1339	1354	1387	1420	1435	1420	1387	1354	1339	1354	1387	1420
45	1260	1242	1202	1166	1154	1166	1202	1242	1260	1242	1202	1166	1154	1166	1202	1242
50	1077	1058	1015	985	977	985	1015	1058	1077	1058	1015	985	977	985	1015	1058
55	894	874	835	811	805	811	835	874	894	874	835	811	805	811	835	874
60	716	697	663	648	645	648	663	697	716	697	663	648	645	648	663	697
65	550	534	509	498	497	498	509	534	550	534	509	498	497	498	509	534
70	399	386	368	362	362	362	368	386	399	386	368	362	362	362	368	386
75	261	254	243	240	239	240	243	254	261	254	243	240	239	240	243	254
80	146	141	136	135	135	135	136	141	146	141	136	135	135	135	136	141
85	56	55	54	54	54	54	54	55	56	55	54	54	54	54	54	55
90	3	2	3	3	3	3	3	2	3	2	3	3	3	3	3	2
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	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

**Average Luminance (cd/m<sup>2</sup>)**  
Horizontal Angle (Degrees)

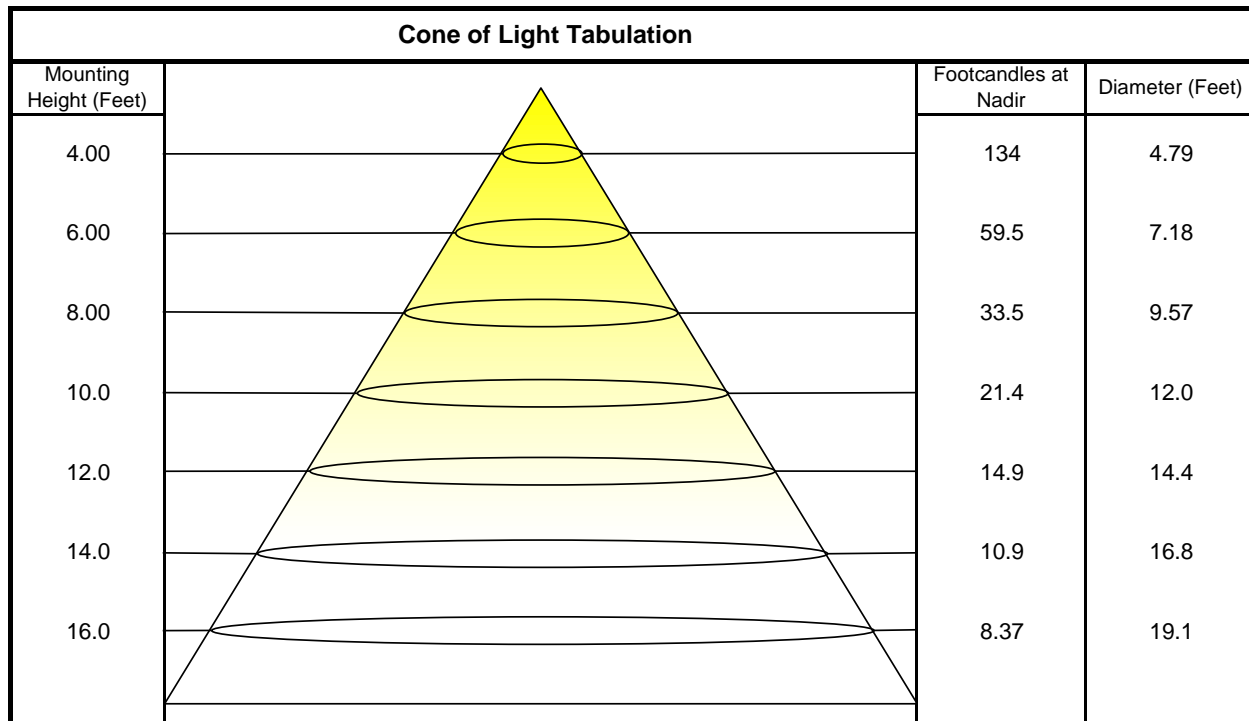
Vertical Angle (Degrees)	Horizontal Angle (Degrees)		
	0	45	90
0	7478	7478	7478
45	6220	5934	5697
55	5444	5080	4901
65	4542	4201	4104
75	3521	3276	3227
85	2240	2155	2165



### Utilization of Lumens - Zonal Cavity Method

Effective Floor Cavity Reflectance 20%																		
Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	6108	6108	6108	6108	5966	5966	5966	5966	5700	5700	5700	5458	5458	5458	5235	5235	5235	5130
1	5624	5398	5195	5012	5487	5282	5098	4931	5066	4915	4776	4867	4744	4630	4684	4585	4493	4388
2	5149	4754	4427	4151	5018	4658	4357	4102	4478	4226	4007	4312	4102	3917	4159	3985	3830	3723
3	4720	4210	3815	3501	4596	4130	3764	3469	3980	3667	3409	3840	3574	3350	3711	3486	3294	3186
4	4341	3756	3328	3001	4226	3689	3290	2981	3563	3215	2940	3445	3144	2901	3336	3077	2863	2756
5	4006	3376	2935	2610	3901	3319	2905	2596	3212	2847	2568	3112	2792	2541	3020	2739	2514	2409
6	3710	3054	2613	2297	3615	3006	2590	2287	2915	2544	2267	2830	2500	2248	2751	2458	2229	2126
7	3449	2780	2347	2043	3362	2739	2328	2035	2661	2291	2021	2588	2255	2007	2520	2221	1993	1894
8	3217	2545	2123	1833	3138	2510	2108	1828	2443	2078	1817	2381	2049	1806	2321	2020	1795	1700
9	3010	2343	1934	1658	2939	2312	1921	1654	2255	1896	1645	2200	1872	1637	2149	1849	1629	1538
10	2826	2167	1772	1510	2762	2141	1762	1506	2090	1741	1500	2043	1721	1493	1998	1701	1487	1400

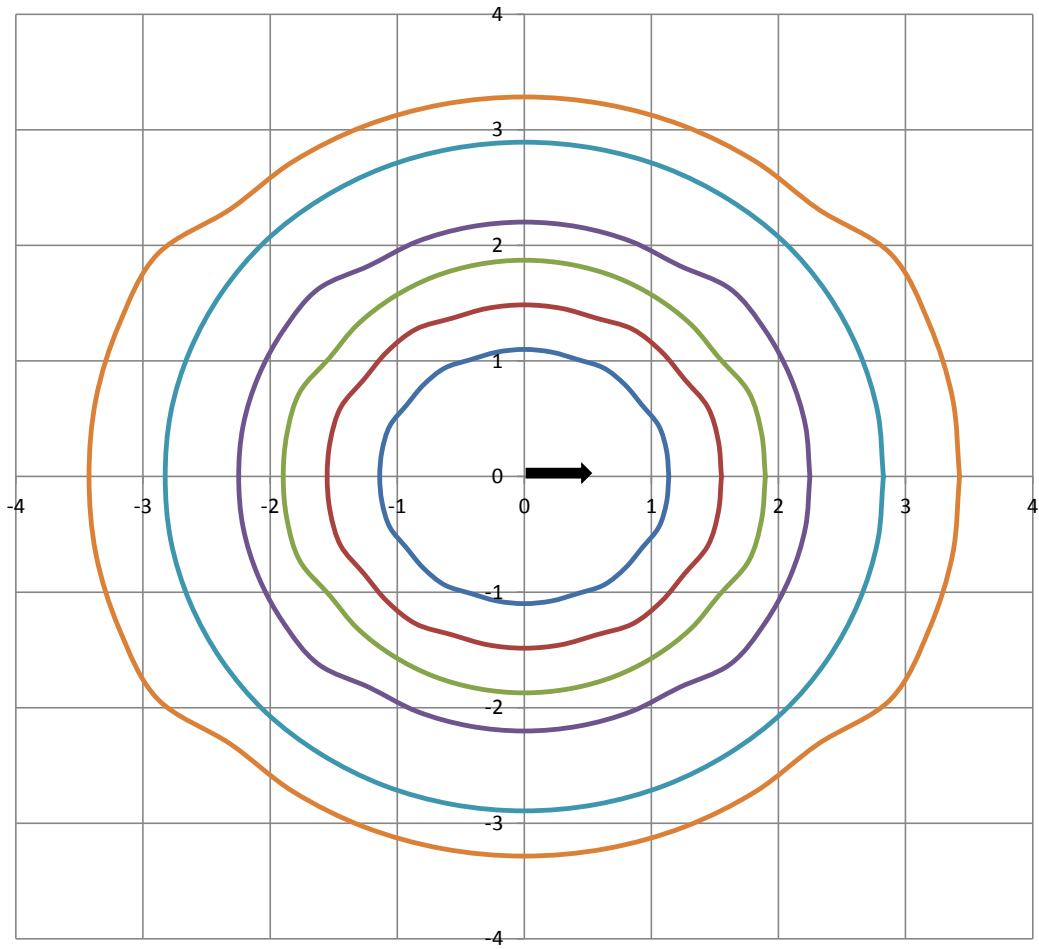
Beam and Field Information	
CIE Type:	Direct
Center Beam Intensity:	2142 Candela
Central Cone Intensity:	2138 Candela
Beam Flux:	3418.2 Lumens
Beam Angle (0-180):	100.3 Degrees
Beam Angle (90-270):	94.6 Degrees
Field Angle (0-180):	153.8 Degrees
Field Angle (90-270):	152.2 Degrees





### ISOFootcandle Plot

Mounting Height - 8 Feet



Grid Lines in Units of Mounting Height







## In-Situ Test

### In-Situ Test Conditions

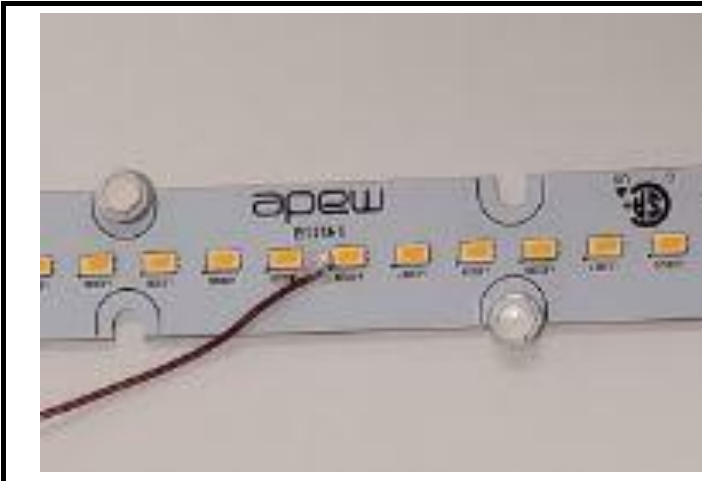
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
21.5 °C	120.0 VAC	N/A	N/A	N/A	60 Hz	N/A

### Summary of Results

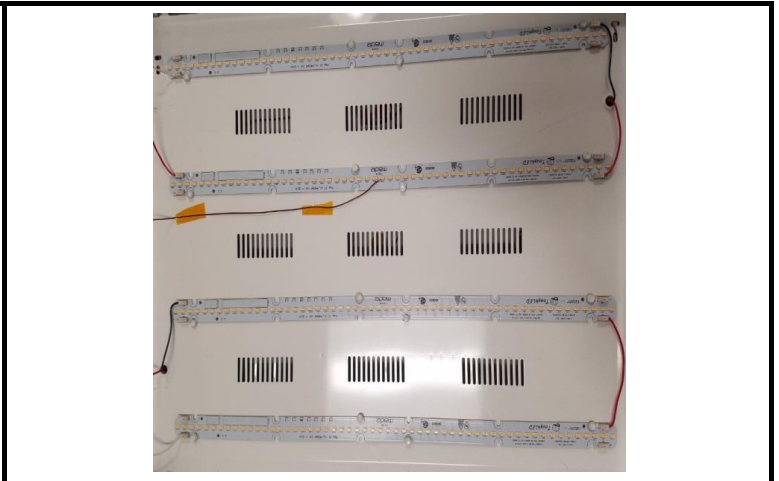
LED Temperature: 40.2 °C  
Driver Temperature: 38.6 °C  
Measured LED Current: 0.05050 A

Temperatures are offset to an ambient temperature of 25°C as described in UL1598-2008

### LED Temperature Location



### Thermocouple Reference



### Driver Temperature Location

