Photometric Test Report

Relevant Standards

☑ ANSI/IES LM-79-2019

Prepared For

Paragon Semiconductor Lighting Technology Co., Ltd.(ParagonLED®)

3F No 369 Sec 2 Wenhua 2Nd Rd New Taipei City, 244 TW

Catalog Number

TTL-225-50-120V-11Z

Project Number

4791276382.1.1

Report Number

4791276382.1-3a

Test Date

2024-06-28

Issue Date

2024-07-03

Prepared By	Approved By
Silvia Wu	Michael Chang
Silvia Wu	Michael Chang

The results contained in this report pertain only to the tested sample.
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1.0 Test List

Test Item	Test	Test Date	Model Number	Tests Conducted By
1	Integrating Sphere Test	2024-06-28	TTL-225-50-120V-11Z	Jeff Hsu
2	Goniophotometer Test	2024-06-28	TTL-225-50-120V-11Z	Jeff Hsu

1.1 Test Site

Company Name	Underwriters Laboratories Taiwan Co., Ltd.
Address	No. 35, Sec. 2, Zhongyang S. Rd., Beitou Dist., Taipei City 112, Taiwan

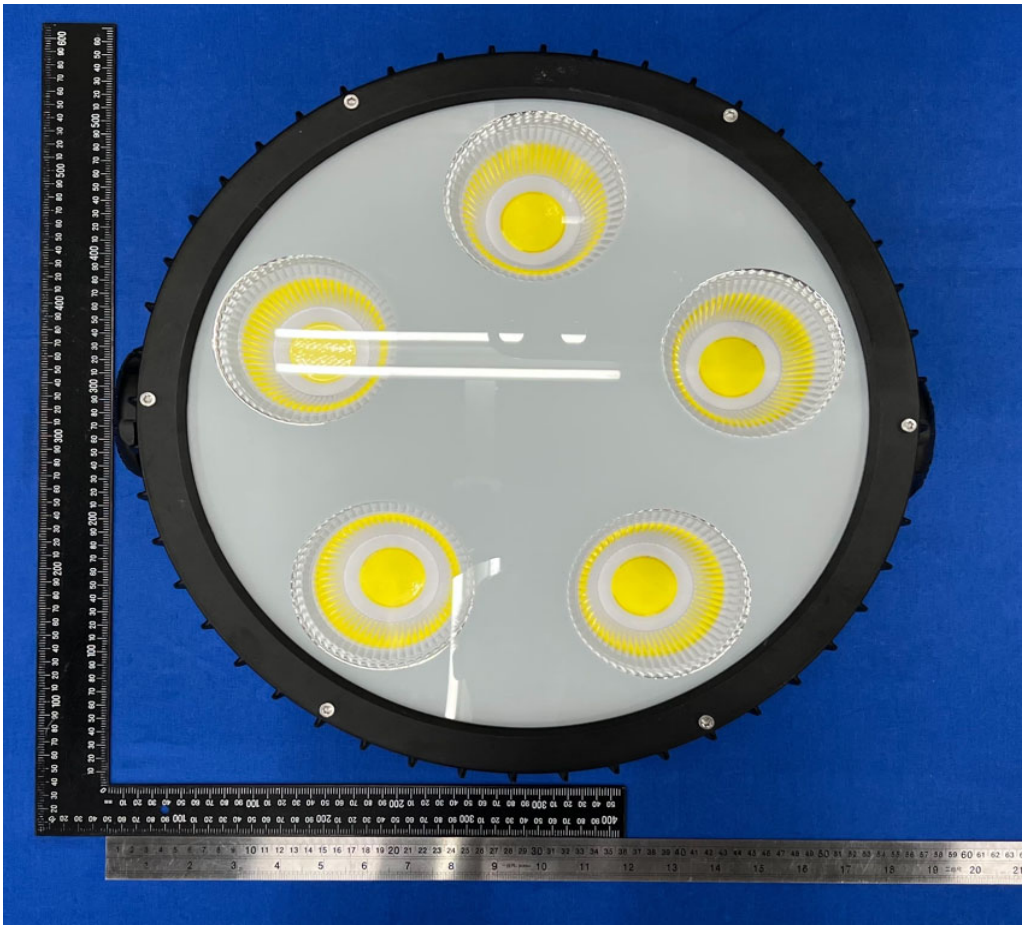
1.2 Remark

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.

2.0 Production Description

Luminaire Description: High Bay Luminaire , Models TTL-225-50-120V-11Z
Electrical Rated: 120 Vac, 60 Hz, 225W
Nominal CCT: 5000K
Family Model and Variation: N/A
Representative (tested) Model: TTL-225-50-120V-11Z
Sample Received Date: 2024-06-28
Number of hours operated prior to measurement (0 h for rating new products): 0 h

Photos of Luminaire Characteristics



3.0 LM-79 Measurement and Test Results

3.1 Integrating Sphere Test

Model No.	TTL-225-50-120V-11Z	Sample No.	7352153
Operate time (Min.)	80	Stabilization time (Min.)	70

Test Method

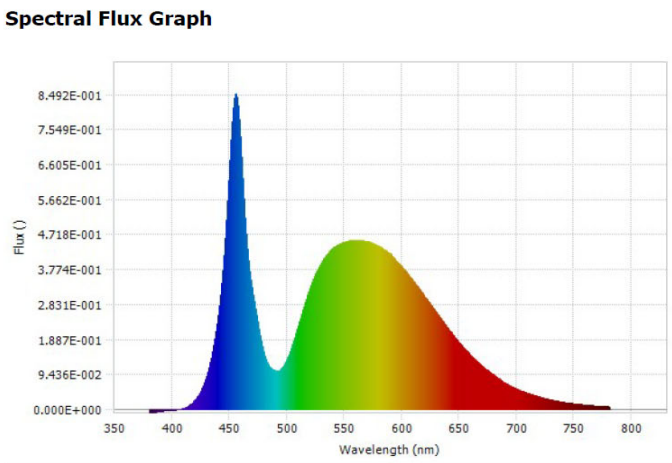
1. The samples were tested according to ANSI/IES LM-79-19.
2. Photometric parameters were measured using a 2-m integrating sphere with more than 97% coating reflectance, 4π geometry, a spectroradiometer, and software.
3. The ambient temperature condition inside the sphere was maintained at 25 °C ± 0.7 °C (U=0.5 °C, k=2), laboratory humidity should be monitor and maintained between 10 to 65 %RH.
4. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Self-absorption correction is applied in measurements. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

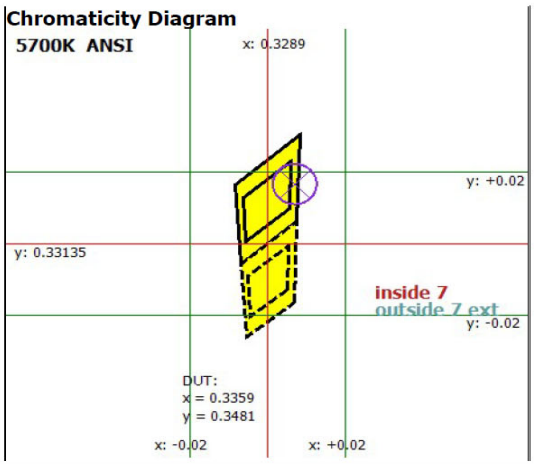
Integrating Sphere Test Conditions

Ambient Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.2	119.98	60	2.151	227.42	0.88	Base up

Test Results

CCT (K)	CRI (R_a)	R_9	Duv	Luminous Flux (lm)	Luminous Efficacy (lm/W)
5,358	75	-13	0.0021	27271.1	119.9





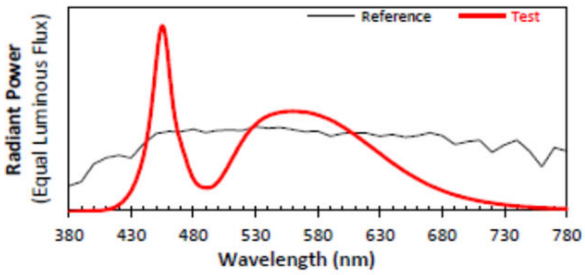
3.1 Integrating Sphere Test (Cont'd)

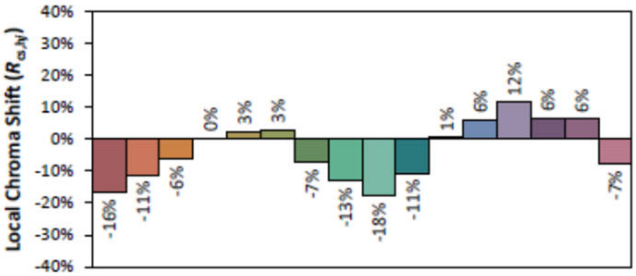
Chrom x	0.3359	**Chrom y**	0.3481
Chrom u	0.2066	**Chrom v**	0.3210
Chrom u'	0.2066	**Chrom v'**	0.4816
R_1	73	**R_2**	82
R_3	84	**R_4**	73
R_5	72	**R_6**	72
R_7	85	**R_8**	62
R_9	-13	**R_{10}**	52
R_{11}	67	**R_{12}**	40
R_{13}	75	**R_{14}**	91
R_{15}	69	**$R_{cs,h1}$**	-16%
R_f	75	**R_g**	92

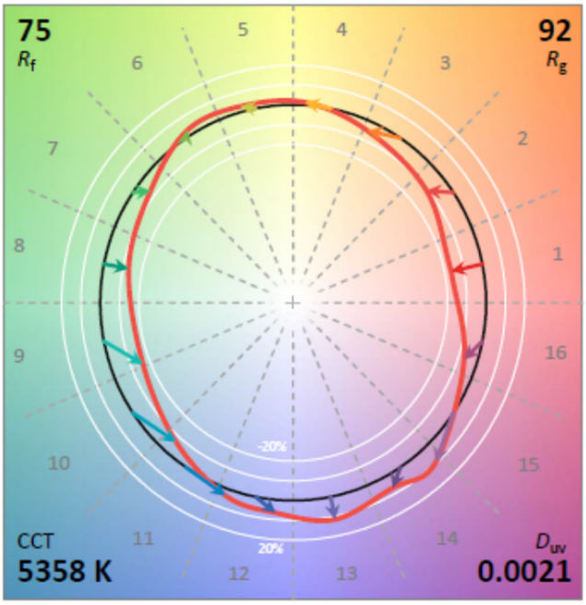
3.1 Integrating Sphere Test (Cont'd)

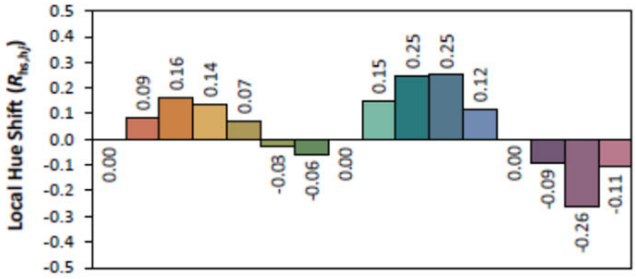
ANSI/IES TM-30-18 Color Rendition Report

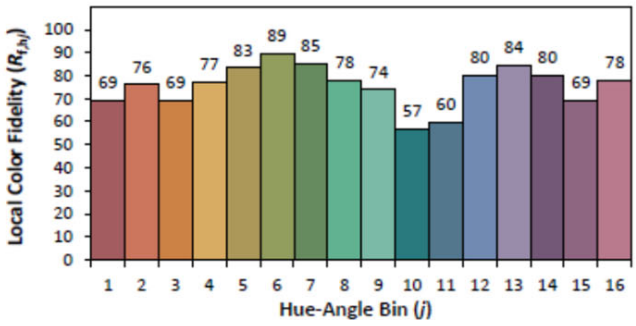
Date: 2024-06-28 **Model:** TTL-225-50-120V-11Z

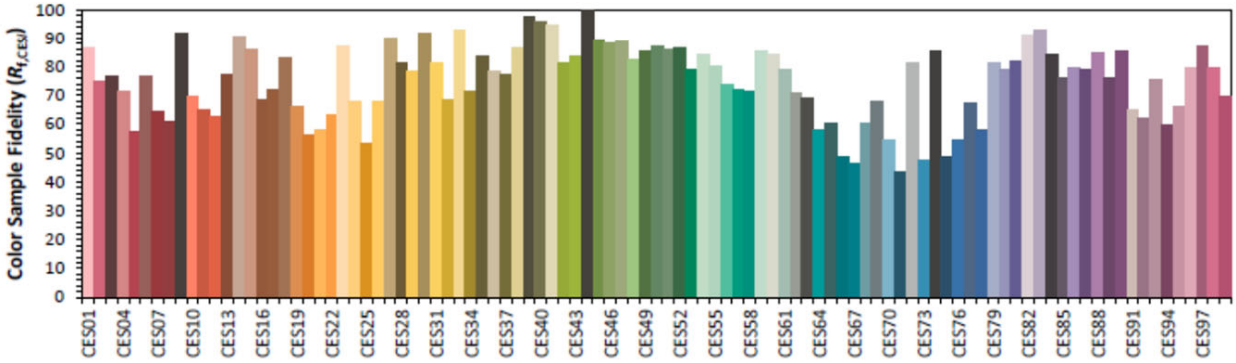












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3359
y	0.3481
u'	0.2066
v'	0.4816

CIE 13.3-1995 (CRI)

R_a	75
R_9	-13

3.0 LM-79 Measurement and Test Results

3.2 Goniophotometer Test

Model No.	TTL-225-50-120V-11Z	Sample No.	7352153
Operate time (Min.)	66	Stabilization time (Min.)	56

Test Method

1. The sample was tested according to the ANSI/IES LM-79-2019.
2. Photometric paramters were measured using a type C goniophotometer and software.
3. The ambient temperature shall be maintained at 25 °C ± 0.5 °C (U=0.7 °C, K=2), measured at a point not more than 1.5 m from the sample and at the same height as the sample.
4. Laboratory humidity should be monitor and maintained between 10 to 65 %RH; the instantaneous tangential velocity of any point on the DUT shalll be less than an upper toleraance limit of 0.2 m/s.
5. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

Goniophotometer Test Conditions

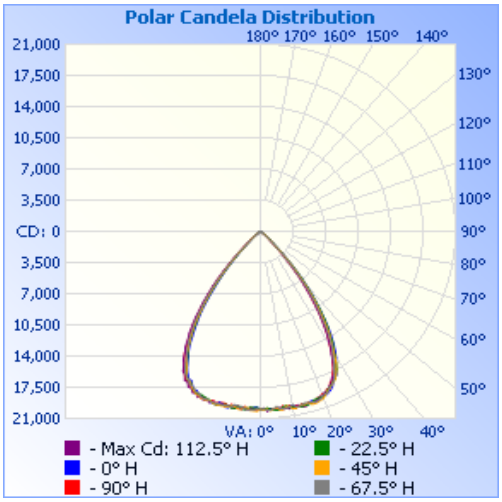
Ambient Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
24.6	120.18	60	2.186	232.58	0.890	Base Up

Test Result

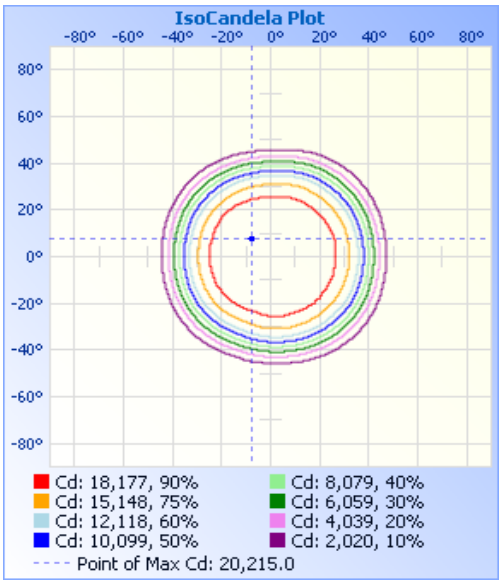
Flux (lm)	Zonal Lumen Requirement (20-50°)	Field Angle, ° (10%)		Beam Angle, ° (50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
25743.6	68.7	90.9	90	72.2	71.2	110.69

3.2 Goniophotometer Test (Cont'd)

Polar Candela Distribution



IsoCandela Plot



3.2 Goniophotometer Test (Cont'd)

Zonal Lumen Summary

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	15,887.4	61.7%
0-40	23,020.1	89.4%
0-60	25,508.0	99.1%
60-90	230.9	0.9%
70-100	99.0	0.4%
90-120	0.0	0%
0-90	25,738.9	100%
90-180	0.0	0%
0-180	25,738.9	100%

Lumens Per Zone

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	476.9	1.9%	90-95	0.0	0%
5-10	1,424.9	5.5%	95-100	0	0%
10-15	2,365.0	9.2%	100-105	0	0%
15-20	3,259.0	12.7%	105-110	0	0%
20-25	3,997.6	15.5%	110-115	0	0%
25-30	4,364.0	17.0%	115-120	0	0%
30-35	4,060.4	15.8%	120-125	0	0%
35-40	3,072.3	11.9%	125-130	0	0%
40-45	1,651.4	6.4%	130-135	0	0%
45-50	548.7	2.1%	135-140	0	0%
50-55	185.9	0.7%	140-145	0	0%
55-60	101.9	0.4%	145-150	0	0%
60-65	74.1	0.3%	150-155	0	0%
65-70	57.8	0.2%	155-160	0	0%
70-75	43.5	0.2%	160-165	0	0%
75-80	31.8	0.1%	165-170	0	0%
80-85	20.4	0.1%	170-175	0	0%
85-90	3.3	0.0%	175-180	0	0%

3.2 Goniophotometer Test (Cont'd)

Candela Table - Type C

Candela Table - Type C																	
γ/C	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
0	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942	19942
1	20064	19977	20056	19921	19963	19829	20055	20062	19737	19788	20166	19917	19976	19903	20048	20007	20064
2	20003	19808	19974	20041	20034	20203	19826	19808	19762	19822	20130	20011	19988	20062	19929	19843	20003
3	19888	19988	20152	20085	20023	20018	20041	20028	20055	19769	20133	20014	19818	19823	19763	19933	19888
4	19917	20062	19949	19940	19904	19934	19835	19803	19927	19891	19839	20050	20029	19959	20010	19809	19917
5	20031	20119	19836	19704	19921	20144	20092	20062	19772	20091	19788	20008	19691	20007	19751	19866	20031
6	20036	20089	20115	19956	20043	19865	19928	19768	20067	19813	20081	19749	20029	19816	19880	20042	20036
7	20012	19827	20127	20023	19712	20132	20068	20038	19800	19773	20058	19744	19730	19913	19975	19786	20012
8	19854	19732	19791	20018	20027	19928	20127	20016	19754	20035	19838	19635	19894	19950	19756	20004	19854
9	19881	19998	19853	19953	19751	20163	19793	20040	19740	20024	19749	19890	19649	20004	19993	19896	19881
10	19825	20053	20198	19717	20060	19889	20090	19722	20071	19978	19970	19873	19882	19779	19649	19864	19825
14	20048	20099	19986	19836	20089	20215	20141	19749	19990	19992	19987	19849	19840	20010	19834	19708	20048
15	20055	20088	19903	19895	19820	19944	19768	19986	19948	19974	19965	19878	19633	19731	19657	19824	20055
20	19624	19796	19890	19520	19388	19715	19576	19233	19471	19416	19608	19304	19408	19804	19624	19767	19624
25	18597	18542	18624	18582	18362	18151	18034	17904	18254	18440	18313	18321	18504	18607	18785	18842	18597
30	16291	16022	15914	15454	15018	15107	14959	14744	15487	15663	15823	15908	16439	16663	16408	16917	16291
35	12123	12043	11572	11061	10779	10628	10340	10173	11298	11636	11752	12313	12612	12757	12889	13144	12123
40	7058	6987	6631	6252	5823	5638	5479	5334	6283	6714	7017	7463	7657	8009	8106	8044	7058
45	2639	2455	2265	2055	1799	1680	1625	1594	2233	2391	2572	2913	3102	3321	3412	3403	2639
50	666	642	606	567	513	494	477	479	612	670	742	783	854	883	897	930	666
55	270	263	259	250	243	236	233	238	266	289	301	311	316	317	318	324	270
60	178	179	176	167	168	164	163	160	177	183	187	191	193	192	194	197	178
65	130	127	127	124	122	123	121	120	125	127	132	137	136	139	140	140	130
70	101	101	99	96	95	93	92	91	99	101	104	105	107	107	107	109	101
75	68	65	65	66	65	64	64	64	67	68	70	69	71	73	73	75	68
80	52	51	50	49	49	48	48	46	50	53	52	54	55	54	54	56	52
85	23	19	18	14	10	7	6	7	14	18	20	25	28	29	31	34	23
90	0	1	0	0	0	0	0	0	1	1	1	0	1	1	1	1	0
95	0	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	0
105	0	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	0
115	0	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	0
125	0	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	0
135	0	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	0
145	0	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	0
155	0	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	0
165	0	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	0
175	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

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