

## LM-79-08 Test Report

For

# Beyond LED Technology

1939 Parker Court, Stone Mountain, GA 30087

## Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area

### Luminaires

Model name(s): BLT-SWP01C-200WBSPSA1-BRSW50

Remark: "a" can be any two letters for lamp colors; "BR" =brown, "BH" =black, "WH" = white;

"b" can be "S" for Surge-Protective Device or blank for not provided;

"c" can be "DM"="DC" for Motion sensor, "DR"="DC" for PIR sensor or blank;

"e" can be any two digits for CCT;

Representative (Tested) Model:  
BLT-SWP01C-200WBSPSA1-  
BRSW50

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

Test & Report By:



Engineer: Winny Wu

Date: 2022-05-07

Review By:

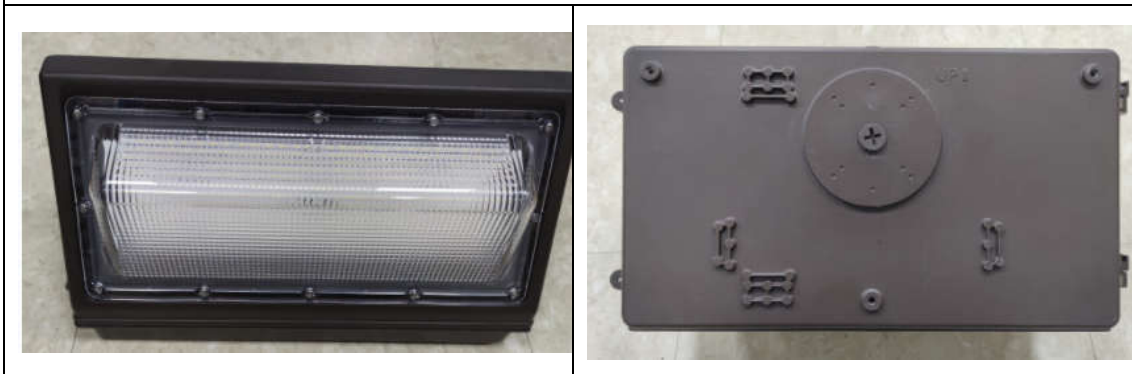


Manager: Jason Luo

### 1.1 Product Information:

Organization Name	Beyond LED Technology	
Brand Name	Beyond LED Technology	
Model Number	BLT-SWP01C-200WBSPSA1-BRSW50	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	200W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,4500K, 5000K,5700K,6500K	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RC35003P1	
Sample Number	BLC2204035E-A1(4000K)A2(6500k)	
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	2022-04-23
Date of Test	2022-04-25
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2017 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	BL-QP-033

## 1.3 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals. Goniophotometer far field detector  $\text{fl}'=1.42\%$ , Test distance: 14.14m

### 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.

Self-absorption:

AST-SWP01C-200WBSPSA1-abc40:1.527

AST-SWP01C-200WBSPSA1-abc65:1.528

### 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.

Laboratory: UTEST TECHNICAL LABORATORY A2LA Certificate# 4810.01

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Report Format Number BL-FM-SA-012

## 2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2022-04-25	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	AST-SWP01C-200WBSPSA1-abc40		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220403	120.0	60	1.657	198.06	0.996	7.53
5E-A1	277.0	60	0.720	189.22	0.949	8.26
<b>DLC Pass Criteria</b>					$\geq 0.9(-3\%)$	$\leq 20(+5)$

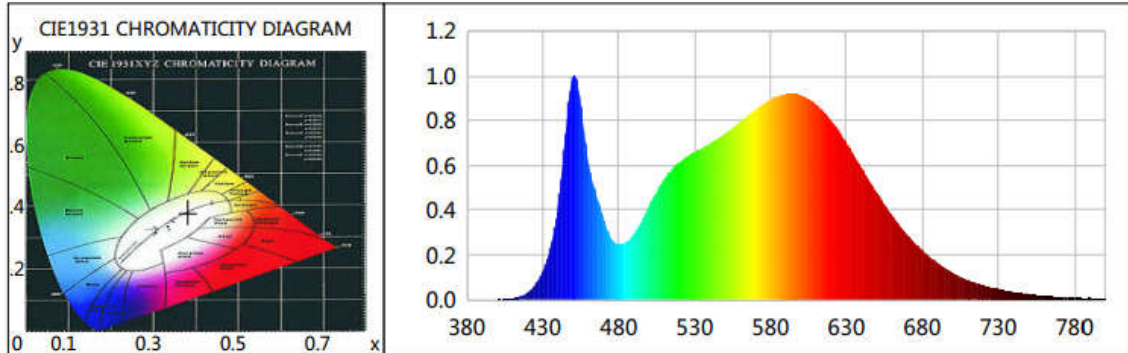
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	7
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	3958	R3	94	R11	80
Duv	0.0012	R4	81	R12	60
Chromaticity (x, y)	x=0.3832 y=0.3809	R5	81	R13	82
Chromaticity (u', v')	u(u')=0.2252 v'=0.5038	R6	84	R14	97
Color Rendering Index (CRI)	82	R7	86	R15	74
R9	7	R8	64	--	--
Rf	84	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1 (%)	-12	--	--	--	--

### Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	26390.6	25386.6	$\geq 300$ (0-90° zone)*** (-10%)
0-90° Total Luminous (lm)	25293.2	24321	
Luminous Efficacy (lm/W)	133.25	134.16	Premium: $\geq 120(-3\%)$
0-90° Luminous Efficacy (lm/W)	127.70	128.53	
Most worst Luminous/Highest	128.18		
Zonal lumens in the 80-90°/0-90°zone (%)	3.58	--	$\leq 10(+3)$
Beam Angle (°)	101.8	--	--
Center Beam Candle Power (cd)	9291	--	--

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.1353	535	0.6388	260.4447	690	0.2890	117.8322
385	0.0004	0.1563	540	0.6591	268.7085	695	0.2535	103.3551
390	0.0004	0.1597	545	0.6776	276.2645	700	0.2196	89.5421
395	0.0007	0.2843	550	0.6985	284.7555	705	0.1897	77.3221
400	0.0012	0.4915	555	0.7191	293.1832	710	0.1634	66.6024
405	0.0024	0.9617	560	0.7411	302.1254	715	0.1405	57.2842
410	0.0064	2.6139	565	0.7664	312.4377	720	0.1204	49.0944
415	0.0153	6.2454	570	0.7955	324.3327	725	0.1033	42.1257
420	0.0330	13.4721	575	0.8229	335.4865	730	0.0879	35.8253
425	0.0668	27.2151	580	0.8479	345.7033	735	0.0746	30.4284
430	0.1283	52.2870	585	0.8721	355.5450	740	0.0647	26.3959
435	0.2332	95.0927	590	0.8941	364.5280	745	0.0549	22.3883
440	0.4205	171.4171	595	0.9097	370.8719	750	0.0471	19.2010
445	0.7451	303.7581	600	0.9185	374.4756	755	0.0405	16.5109
450	0.9993	407.4266	605	0.9195	374.8874	760	0.0337	13.7572
455	0.8696	354.5371	610	0.9130	372.2325	765	0.0301	12.2719
460	0.6108	249.0236	615	0.8971	365.7610	770	0.0256	10.4190
465	0.4726	192.6686	620	0.8720	355.5126	775	0.0212	8.6457
470	0.3607	147.0575	625	0.8401	342.5075	780	0.0178	7.2552
475	0.2734	111.4767	630	0.7992	325.8498	785	0.0150	6.1358
480	0.2461	100.3366	635	0.7511	306.2028	790	0.0136	5.5327
485	0.2577	105.0680	640	0.6980	284.5516	795	0.0111	4.5191
490	0.2928	119.3884	645	0.6438	262.4697	800	0.0098	4.0080
495	0.3496	142.5163	650	0.5874	239.4599			
500	0.4185	170.6155	655	0.5309	216.4289			
505	0.4821	196.5450	660	0.4762	194.1317			
510	0.5386	219.5784	665	0.4251	173.3274			
515	0.5795	236.2742	670	0.3765	153.4884			
520	0.6142	250.4036	675	0.3307	134.8330			
525	0.6388	260.4447	680	0.2890	117.8322			
530	0.6591	268.7085	685	0.2535	103.3551			



**TM30**

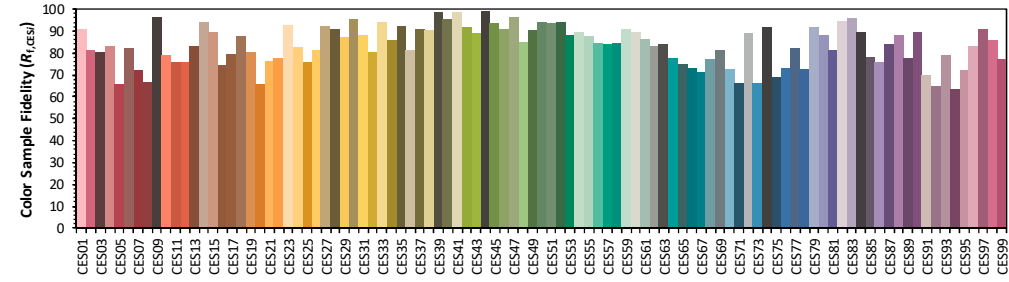
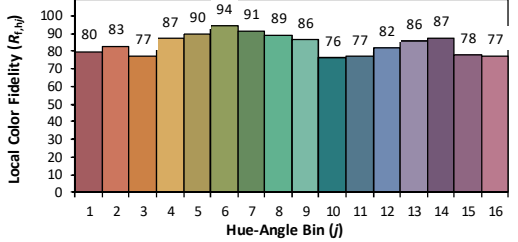
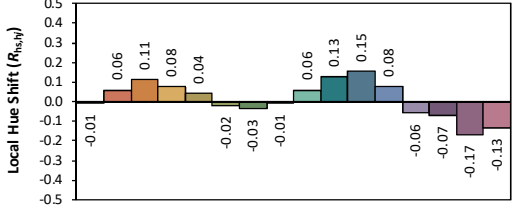
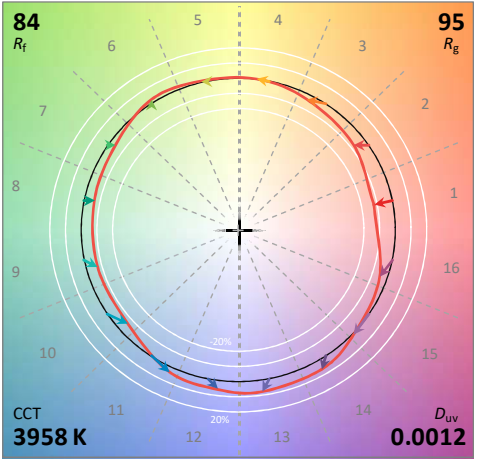
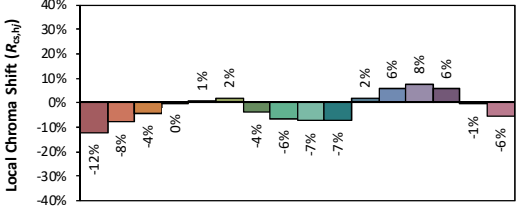
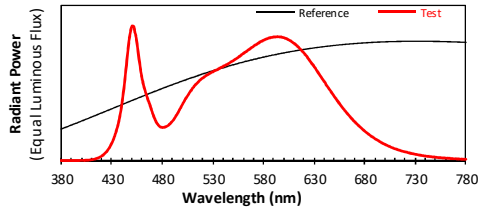
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-XX80RC35003P1

**Manufacturer:** SMART LIGHT CO., LTD

**Date:** 2022/4/25

**Model:** AST-SWP01C-200WBSPSA1-abc40



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

$x$  0.3832  
 $y$  0.3809  
 $u'$  0.2252  
 $v'$  0.5038

CIE 13.3-1995 (CRI)  
 $R_a$  82  
 $R_9$  7

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

## Zonal Lumen Tabulation

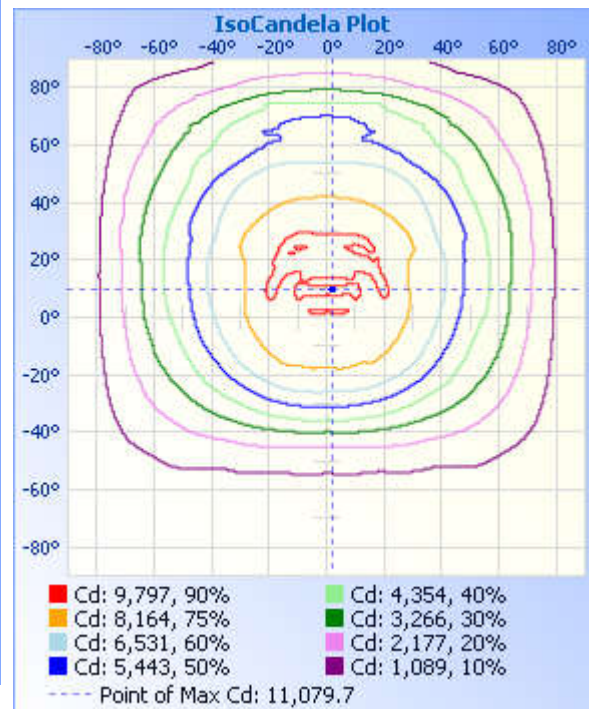
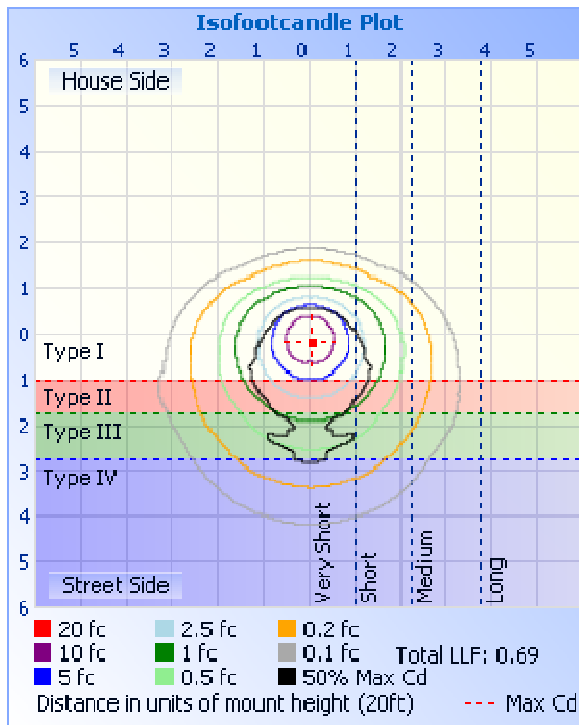
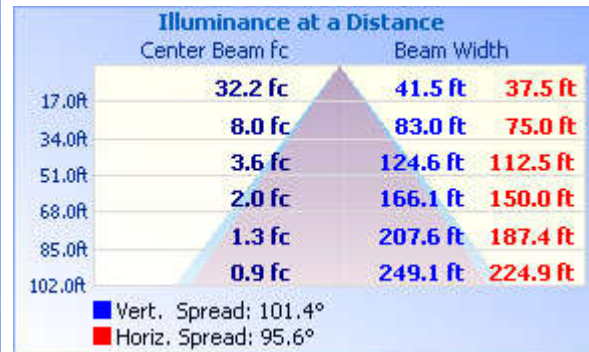
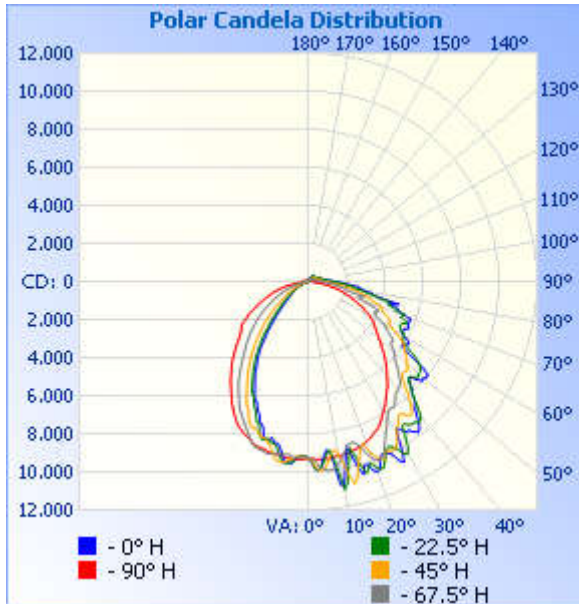
### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	7,451.3	28.2%	28.2%
0-40	11,854.7	44.9%	44.9%
0-60	19,566.2	74.1%	74.1%
60-90	5,727.0	21.7%	21.7%
70-100	3,291.0	12.5%	12.5%
90-120	874.9	3.3%	3.3%
0-90	25,293.2	95.8%	95.8%
90-180	1,095.4	4.2%	4.2%
0-180	26,388.6	100%	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	904.1	3.4%	90-100	407.5	1.5%
10-20	2,604.7	9.9%	100-110	288.6	1.1%
20-30	3,942.4	14.9%	110-120	178.9	0.7%
30-40	4,403.4	16.7%	120-130	96.8	0.4%
40-50	4,119.8	15.6%	130-140	76.5	0.3%
50-60	3,591.7	13.6%	140-150	26.9	0.1%
60-70	2,843.5	10.8%	150-160	10.3	0%
70-80	1,977.3	7.5%	160-170	7.3	0%
80-90	906.3	3.4%	170-180	2.6	0%

**Photometric Data**





**Candela Table - Type 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	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291	9291
1	9430	9423	9372	9314	9293	9222	9159	9175	9164	9169	9208	9282	9306	9335	9360	9395	9430
2	9815	9775	9665	9419	9328	9183	9195	9140	9126	9182	9207	9231	9324	9404	9632	9770	9815
3	9942	9932	9863	9627	9354	9224	9103	9204	9243	9174	9184	9217	9348	9581	9879	9942	9942
4	9732	9796	9948	9781	9353	9252	9233	9262	9304	9290	9217	9266	9372	9768	9986	9847	9732
5	9270	9464	9862	9891	9358	9193	9301	9518	9555	9505	9347	9246	9373	9915	9902	9565	9270
6	8921	9076	9632	9996	9352	9164	9438	9555	9564	9575	9389	9159	9351	9980	9719	9139	8921
7	9037	8921	9265	10002	9350	9229	9607	9585	9586	9579	9563	9133	9331	10018	9348	8958	9037
8	9500	9333	9028	9930	9330	9277	9624	9585	9384	9592	9549	9172	9283	9949	9056	9357	9500
9	10784	10007	8945	9761	9296	9257	9588	9283	9004	9344	9568	9192	9241	9762	8910	9959	10784
10	10885	11080	9297	9582	9266	9223	9566	9017	8758	9044	9529	9171	9225	9548	9193	11062	10885
11	10198	10805	9717	9387	9282	9272	9404	8770	8636	8802	9420	9170	9228	9354	9672	10849	10198
12	9445	10138	10443	9177	9263	9387	9091	8720	8610	8674	9127	9233	9225	9146	10321	10173	9445
13	8887	9488	10882	8946	9242	9398	8875	8698	8410	8675	8851	9292	9194	8925	10857	9495	8887
14	9448	9018	10639	8812	9217	9357	8691	8540	8560	8531	8713	9259	9132	8746	10608	8974	9448
15	10088	9501	10159	8760	9179	9317	8561	8629	8567	8529	8562	9199	9094	8670	10173	9433	10088
16	10531	10072	9693	8811	9151	9270	8587	8684	8482	8661	8521	9177	9078	8723	9638	10039	10531
17	10098	10516	9277	8978	9115	9187	8534	8518	8055	8513	8505	9155	9070	8920	9242	10436	10098
18	10095	10284	9033	9264	9067	9113	8432	8292	7878	8331	8371	9092	9029	9208	9025	10272	10095
19	10496	10088	9169	9620	8993	8997	8340	7946	7781	7910	8255	8999	8946	9588	9161	10061	10496
20	10629	10344	9578	9900	8929	8857	8368	7911	7460	7833	8192	8833	8854	9873	9537	10253	10629
21	10527	10561	9811	10043	8886	8655	8280	7633	7311	7636	8216	8661	8784	10015	9754	10457	10527
22	10064	10552	10044	10084	8804	8478	8125	7383	7119	7337	8085	8495	8732	10046	9978	10435	10064
23	9869	10301	10103	10017	8712	8335	7935	7234	6886	7173	7942	8332	8650	9948	10057	10181	9869
24	9900	9962	9894	9792	8628	8197	7632	7036	6794	7009	7668	8171	8570	9695	9896	9872	9900
25	9942	9745	9843	9506	8560	8057	7474	6816	6659	6729	7424	8025	8489	9388	9828	9719	9942
26	10126	9659	9878	9213	8468	7920	7348	6700	6406	6604	7302	7902	8403	9100	9821	9592	10126
27	10560	9742	9891	8943	8329	7786	7147	6585	6132	6491	7123	7756	8270	8865	9857	9622	10560
28	10731	9944	9812	8745	8175	7627	6914	6349	5981	6299	6884	7607	8111	8659	9780	9854	10731

29	10205	10340	9629	8546	8026	7431	6696	6097	5752	6048	6640	7445	7988	8422	9533	10213	10205
30	9421	10446	9331	8290	7882	7254	6499	5921	5589	5811	6415	7257	7847	8207	9229	10285	9421
31	8983	10176	9034	8108	7759	7073	6280	5668	5273	5613	6220	7073	7676	8040	8978	9996	8983
32	9194	9633	8875	7967	7629	6913	6074	5515	5067	5405	5995	6869	7544	7942	8795	9397	9194
33	9414	9072	8696	7941	7465	6765	5908	5257	4890	5223	5824	6706	7367	7951	8589	8929	9414
34	9441	9002	8482	7963	7303	6593	5703	4988	4663	4932	5623	6533	7194	7945	8439	8915	9441
35	9613	9190	8436	7899	7159	6362	5503	4779	4433	4724	5414	6352	7040	7837	8464	9125	9613
36	9795	9253	8648	7765	7026	6158	5311	4545	4198	4484	5195	6150	6894	7680	8691	9128	9795
37	9693	9262	8816	7613	6901	5972	5079	4301	3828	4262	4995	5920	6738	7508	8797	9104	9693
38	9431	9365	8808	7456	6760	5798	4887	4077	3586	4005	4772	5742	6609	7395	8717	9189	9431
39	9050	9372	8634	7403	6582	5600	4680	3864	3374	3816	4573	5562	6433	7342	8548	9180	9050
40	8720	9164	8359	7358	6426	5419	4456	3575	3110	3555	4393	5370	6278	7305	8181	8975	8720
41	8584	8762	8059	7309	6280	5260	4244	3296	2853	3288	4180	5179	6142	7236	7895	8551	8584
42	8324	8345	7760	7219	6137	5112	4000	3072	2643	3045	3958	5003	6005	7089	7573	8138	8324
43	7985	8007	7413	7054	5987	4964	3808	2891	2454	2860	3733	4860	5873	6866	7255	7863	7985
44	7849	7765	7151	6865	5860	4783	3632	2701	2238	2672	3557	4720	5706	6720	6990	7643	7849
45	7571	7495	6982	6681	5702	4634	3463	2467	2059	2461	3391	4567	5534	6548	6850	7393	7571
46	7317	7319	6904	6510	5545	4478	3270	2275	1914	2272	3220	4398	5375	6362	6834	7220	7317
47	7364	7321	6931	6320	5392	4334	3084	2114	1772	2092	3034	4271	5228	6175	6816	7245	7364
48	7711	7494	6971	6170	5193	4178	2890	1955	1630	1953	2830	4104	5078	6013	6796	7392	7711
49	7918	7631	6932	6015	5087	3969	2729	1807	1501	1793	2669	3940	4933	5879	6719	7507	7918
50	7891	7560	6754	5917	4957	3845	2541	1653	1411	1653	2497	3803	4780	5769	6609	7448	7891
51	7986	7548	6675	5771	4806	3699	2380	1532	1322	1525	2350	3642	4645	5659	6533	7409	7986
52	7961	7494	6571	5589	4672	3528	2215	1423	1237	1422	2180	3508	4539	5516	6383	7358	7961
53	7570	7346	6394	5434	4545	3390	2068	1322	1151	1304	2023	3366	4426	5457	6240	7252	7570
54	6754	7134	6261	5388	4418	3224	1937	1217	1068	1210	1868	3223	4335	5456	6120	7012	6754
55	6141	6812	6171	5434	4323	3093	1781	1124	1000	1106	1737	3064	4296	5338	6027	6604	6141
56	5918	6394	6066	5334	4213	2959	1639	1034	938	1020	1627	2906	4217	5104	5879	6135	5918
57	6085	6007	5943	5116	4136	2815	1524	958	882	942	1476	2747	4144	4917	5712	5847	6085
58	6211	5834	5727	4930	4031	2686	1397	888	823	873	1350	2615	3988	4769	5502	5739	6211
59	6157	5816	5515	4748	3933	2544	1283	821	767	804	1250	2467	3825	4648	5338	5706	6157
60	5869	5776	5294	4667	3756	2382	1169	767	705	746	1137	2346	3670	4507	5096	5684	5869

61	5656	5755	5027	4507	3716	2254	1074	716	651	696	1040	2205	3602	4258	4845	5673	5656
62	5539	5562	4823	4241	3517	2133	986	657	587	648	953	2087	3412	4064	4725	5421	5539
63	5645	5446	4777	4027	3326	2005	890	606	530	594	862	1958	3213	3907	4698	5289	5645
64	5655	5348	4761	3890	3239	1893	798	549	476	544	772	1834	3071	3840	4632	5252	5655
65	5808	5346	4731	3827	3138	1792	734	491	434	486	709	1719	2962	3893	4596	5244	5808
66	5729	5397	4575	3905	2916	1664	675	444	399	439	652	1581	2809	3938	4408	5369	5729
67	5690	5585	4347	3989	2754	1524	617	403	370	402	591	1469	2620	3823	4175	5463	5690
68	5700	5544	4251	3894	2652	1399	558	363	343	359	543	1347	2504	3647	4148	5334	5700
69	5703	5199	4164	3631	2467	1296	510	330	304	325	491	1228	2388	3289	3983	5049	5703
70	5675	5251	4078	3293	2320	1191	458	291	265	286	443	1128	2221	3013	3947	5130	5675
71	5302	5344	4056	3015	2201	1074	414	257	228	257	398	1031	2105	2819	3985	5209	5302
72	4941	4899	3825	2848	2053	976	369	220	188	221	356	925	1977	2706	3610	4717	4941
73	4910	4622	3555	2780	1939	880	333	192	167	189	320	837	1845	2725	3425	4536	4910
74	4747	4391	3366	2778	1804	796	289	167	143	165	278	756	1730	3073	3188	4250	4747
75	4319	4389	3394	3055	1676	722	255	142	123	140	242	688	1611	2521	3323	4332	4319
76	4911	4381	3152	2431	1549	654	231	123	102	119	216	626	1468	2142	2954	4228	4911
77	4043	3724	2937	2177	1418	593	192	102	90	102	186	562	1324	1971	2798	3583	4043
78	3584	3604	2782	2015	1249	531	162	85	70	86	158	500	1168	1903	2577	3523	3584
79	3403	3177	2597	2053	1116	474	139	66	57	67	128	445	1048	2002	2447	3054	3403
80	3248	3037	2333	1909	979	411	118	57	43	50	114	390	912	1655	2243	2930	3248
81	3037	2764	2285	1684	845	363	97	38	31	35	98	335	788	1498	2138	2689	3037
82	2814	2490	2067	1540	689	312	68	20	8	23	76	295	641	1483	1876	2397	2814
83	2679	2393	1793	1475	576	270	65	8	0	0	62	251	525	1297	1718	2302	2679
84	2692	2283	1732	1303	468	238	50	8	0	0	38	218	434	1167	1588	2160	2692
85	2327	2078	1433	1213	390	205	41	7	8	0	39	193	369	1080	1317	1984	2327
86	2145	1932	1315	1110	332	189	38	0	9	0	38	179	316	977	1208	1864	2145
87	1919	1823	1192	997	287	174	37	0	9	0	34	169	275	894	1092	1719	1919
88	1764	1650	1093	902	263	160	35	9	0	9	30	151	244	797	1006	1548	1764
89	1588	1508	1015	814	253	152	30	0	9	7	26	141	233	722	922	1420	1588
90	1465	1351	932	727	264	142	26	7	10	0	23	134	245	634	866	1270	1465
91	1343	1249	867	659	273	138	19	0	11	0	22	124	248	584	790	1171	1343
92	1243	1130	810	607	268	129	22	9	0	8	22	119	246	547	747	1050	1243

93	1133	1032	752	555	261	120	20	0	7	8	21	113	244	515	695	953	1133
94	1025	942	712	517	257	116	17	9	11	0	17	109	238	483	659	889	1025
95	945	879	686	492	251	109	17	9	10	0	16	101	239	469	625	822	945
96	857	824	657	478	242	101	13	10	11	0	17	98	239	464	611	775	857
97	792	799	638	473	246	97	13	8	11	10	15	84	235	458	587	750	792
98	756	776	616	474	242	87	12	8	11	10	9	83	228	460	572	734	756
99	727	754	599	476	231	83	10	11	13	9	12	76	230	459	561	722	727
100	699	746	578	473	228	71	12	12	15	0	13	74	225	464	553	705	699
101	685	724	564	473	220	65	8	8	12	8	11	61	212	457	545	696	685
102	674	717	543	470	205	58	9	9	13	0	10	62	206	452	539	687	674
103	657	702	542	455	196	56	10	9	15	10	12	46	191	444	537	675	657
104	657	693	535	444	182	56	0	10	15	0	12	51	183	426	527	673	657
105	654	683	525	427	175	47	11	12	10	13	9	46	170	416	526	667	654
106	662	674	521	402	161	48	13	11	15	0	10	36	161	388	519	666	662
107	668	656	516	385	151	29	9	10	15	8	0	41	154	368	516	652	668
108	655	638	516	368	143	36	9	7	12	9	9	34	144	352	509	634	655
109	653	619	500	334	134	33	16	10	13	9	11	32	135	326	498	614	653
110	619	587	491	301	123	24	12	10	13	9	12	31	122	297	492	587	619
111	586	556	474	278	110	27	12	10	13	11	11	26	117	264	475	553	586
112	533	534	455	258	102	27	10	10	16	0	11	24	106	247	459	523	533
113	464	510	443	235	92	26	10	10	14	9	8	25	96	230	439	496	464
114	405	503	428	209	81	22	14	8	13	13	9	19	86	207	426	474	405
115	369	504	411	190	65	20	12	9	13	8	9	15	79	185	413	478	369
116	374	507	392	171	70	18	0	11	14	9	11	18	71	163	396	484	374
117	396	493	365	152	59	22	15	8	13	15	12	16	65	146	368	474	396
118	402	466	343	135	58	16	13	11	13	11	13	13	56	132	348	453	402
119	387	441	322	125	52	17	11	8	18	17	0	16	50	124	321	424	387
120	362	416	296	107	46	12	14	12	14	12	7	13	45	107	300	399	362
121	336	384	282	95	41	16	12	11	14	15	12	14	45	96	289	374	336
122	300	356	263	81	37	14	10	12	18	15	12	14	38	80	272	350	300
123	284	336	259	73	30	11	14	14	13	12	15	11	34	72	257	326	284
124	260	325	245	53	19	14	13	14	17	15	12	11	28	63	249	313	260

125	246	327	236	54	26	15	14	17	15	15	16	15	25	48	242	308	246
126	236	329	228	49	24	13	14	16	16	15	11	10	27	44	229	309	236
127	235	323	236	44	21	13	17	14	17	16	10	13	25	43	241	316	235
128	248	332	246	38	21	15	15	11	20	18	10	12	20	37	249	319	248
129	264	335	245	31	17	12	14	13	16	16	14	11	23	36	253	327	264
130	286	341	215	28	15	17	16	19	16	10	16	13	20	28	221	328	286
131	289	343	207	24	14	17	14	17	21	17	15	13	21	25	210	324	289
132	298	333	205	23	14	17	11	21	19	17	15	12	15	23	215	330	298
133	324	329	202	20	11	18	12	17	22	14	14	12	18	21	215	329	324
134	359	369	198	16	12	18	18	20	24	18	14	12	16	19	215	374	359
135	388	420	199	18	17	18	9	18	20	18	15	12	12	15	203	407	388
136	397	417	172	15	14	18	20	16	20	13	19	12	18	16	181	416	397
137	400	395	119	17	15	20	19	21	23	18	19	13	17	18	139	389	400
138	395	346	102	15	10	17	19	22	22	16	16	12	14	14	108	346	395
139	356	312	67	12	16	14	19	23	19	20	18	14	16	18	82	314	356
140	299	271	45	13	17	22	22	19	25	20	18	13	17	14	51	279	299
141	273	215	34	12	19	20	21	23	16	20	23	17	21	18	33	229	273
142	254	197	15	16	18	22	23	16	24	19	19	19	18	18	19	201	254
143	224	188	0	17	18	20	22	25	27	21	23	18	17	12	17	194	224
144	196	134	18	16	15	22	22	24	24	22	19	18	20	14	15	144	196
145	178	115	16	16	18	17	17	23	21	23	22	18	18	19	13	109	178
146	129	76	14	14	19	23	22	26	26	23	22	16	22	15	14	83	129
147	105	56	19	15	22	22	25	21	25	26	19	20	22	19	19	49	105
148	84	31	18	16	23	17	25	28	28	23	24	23	25	15	13	36	84
149	61	20	16	17	20	23	21	25	29	24	26	20	24	19	18	18	61
150	49	13	18	19	14	24	23	26	29	24	20	17	25	20	14	18	49
151	32	18	15	16	22	21	26	23	28	20	26	20	19	21	20	18	32
152	13	17	16	20	22	23	28	26	28	22	25	24	26	21	20	19	13
153	24	20	17	15	29	18	22	25	19	27	24	20	27	24	18	15	24
154	18	15	21	19	23	17	28	26	30	28	21	21	21	19	18	16	18
155	22	19	21	19	22	26	26	25	26	25	30	21	23	20	22	20	22
156	22	18	21	22	18	20	22	29	26	29	21	22	24	22	17	16	22



157	25	20	19	18	21	24	26	25	28	23	28	21	26	23	21	20	25
158	23	19	20	24	27	23	26	24	25	27	25	20	27	18	23	22	23
159	20	19	19	20	18	28	28	29	31	28	27	25	24	23	23	20	20
160	23	18	21	23	24	28	30	28	31	31	26	23	26	19	19	19	23
161	26	23	22	23	28	21	26	27	30	28	22	25	18	23	22	21	26
162	25	18	25	24	24	29	28	28	27	24	27	24	25	23	26	18	25
163	25	18	20	22	29	26	29	29	34	28	29	23	27	23	20	24	25
164	26	17	21	24	29	25	32	29	27	30	28	28	26	27	21	23	26
165	21	21	25	18	29	29	32	27	30	27	29	27	28	28	24	23	21
166	25	19	21	23	24	29	31	24	34	27	31	23	28	26	25	24	25
167	28	24	24	26	22	31	28	30	32	29	35	25	27	21	22	20	28
168	27	24	24	29	27	32	31	28	32	29	27	29	28	29	21	21	27
169	30	26	28	20	28	34	32	23	36	27	30	21	31	28	20	23	30
170	26	29	25	27	27	30	31	28	33	28	25	27	28	31	23	26	26
171	29	22	25	26	28	31	33	33	31	31	35	31	31	28	26	25	29
172	22	25	22	24	28	36	29	32	33	28	27	23	28	23	25	27	22
173	29	23	26	25	32	33	30	32	34	28	30	28	30	26	27	28	29
174	28	22	26	18	31	33	25	30	30	30	31	24	25	26	28	29	28
175	26	26	28	27	30	28	31	26	35	23	21	27	34	29	23	32	26
176	28	26	29	28	24	27	29	25	29	23	31	27	31	20	26	27	28
177	28	23	24	24	29	28	29	28	31	22	26	24	28	28	22	22	28
178	30	25	23	25	27	27	30	25	32	15	28	27	26	28	29	16	30
179	30	23	25	20	20	31	27	29	28	26	29	26	26	28	28	30	30
180	31	24	27	28	31	27	33	27	31	26	24	26	33	26	32	28	31

**BUG**

**Lum. Classification System (LCS)**

<b><u>LCS Zone</u></b>	<b><u>Lumens</u></b>	<b><u>%Lamp</u></b>	<b><u>%Lum</u></b>
FL (0-30)	4048.7	15.3	15.3
FM (30-60)	8027.8	30.4	30.4
FH (60-80)	3968.5	15.0	15.0
FVH (80-90)	834.9	3.2	3.2
BL (0-30)	3402.7	12.9	12.9
BM (30-60)	4089.8	15.5	15.5
BH (60-80)	851.8	3.2	3.2
BVH(80-90)	71.2	0.3	0.3
UL (90-100)	407.4	1.5	1.5
UH (100-180)	687.8	2.6	2.6
Total	26390.6	99.9	100.0
<b>BUG Rating</b>	<b>B4-U4-G5</b>		

## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2022-04-25	<b>Test Ambient:</b>	25.2 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	AST-SWP01C-200WBSPSA1-abc65		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC220403	120.0	60	1.652	197.43	0.996	7.41
5E-A2	277.0	60	0.715	188.12	0.95	8.37
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

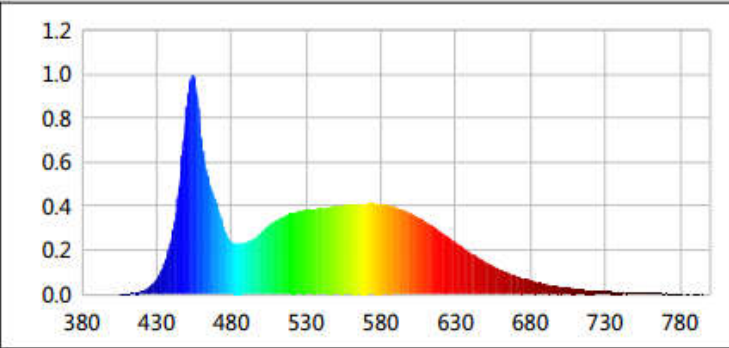
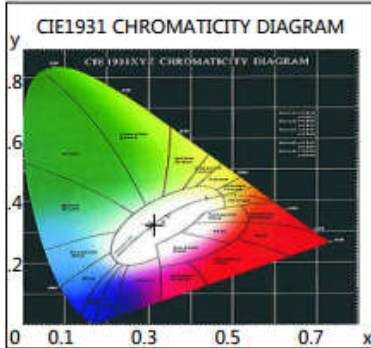
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	4
Frequency (Hz)	60	R2	91	R10	76
CCT (K)	6627	R3	93	R11	80
Duv	0.0031	R4	80	R12	56
Chromaticity (x, y)	x=0.3108 y=0.3268	R5	82	R13	85
Chromaticity (u', v')	u(u')=0.1973 v'=0.4669	R6	85	R14	97
Color Rendering Index (CRI)	83	R7	86	R15	77
R9	4	R8	67	--	--
Rf	82	--	--	--	--
Rg	92	--	--	--	--
Rcs,h1(%)	-14	--	--	--	--

### Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	27231.4	26357.3	>=300 (0-90° zone)*** (-10%)
Luminous Efficacy (lm/W)	137.93	140.11	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	133.50		

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0006	0.4769	535	0.3755	318.9597	690	0.0848	72.0275
385	0.0005	0.4305	540	0.3807	323.4481	695	0.0738	62.7239
390	0.0004	0.3316	545	0.3839	326.0909	700	0.0633	53.7434
395	0.0005	0.4073	550	0.3892	330.6199	705	0.0535	45.4211
400	0.0006	0.4927	555	0.3934	334.2398	710	0.0467	39.6367
405	0.0012	1.0394	560	0.3965	336.8484	715	0.0396	33.6013
410	0.0031	2.6255	565	0.4012	340.7925	720	0.0328	27.8250
415	0.0070	5.9391	570	0.4065	345.3066	725	0.0284	24.1615
420	0.0161	13.6532	575	0.4101	348.4202	730	0.0249	21.1207
425	0.0346	29.4104	580	0.4101	348.3718	735	0.0210	17.8778
430	0.0710	60.2982	585	0.4119	349.8861	740	0.0179	15.2130
435	0.1401	119.0130	590	0.4088	347.2681	745	0.0151	12.8323
440	0.2613	222.0071	595	0.4032	342.4888	750	0.0130	11.0747
445	0.4930	418.8418	600	0.3940	334.6706	755	0.0104	8.8714
450	0.8570	728.0221	605	0.3824	324.8426	760	0.0097	8.2241
455	0.9848	836.5878	610	0.3677	312.3532	765	0.0089	7.5360
460	0.7150	607.3772	615	0.3497	297.0744	770	0.0067	5.6563
465	0.5116	434.6025	620	0.3297	280.0866	775	0.0059	5.0435
470	0.4132	351.0476	625	0.3075	261.2181	780	0.0050	4.2836
475	0.3029	257.3471	630	0.2838	241.0621	785	0.0039	3.3252
480	0.2394	203.3577	635	0.2595	220.4091	790	0.0037	3.1576
485	0.2288	194.3280	640	0.2343	199.0329	795	0.0024	2.0175
490	0.2354	199.9725	645	0.2105	178.8383	800	0.0022	1.9080
495	0.2531	214.9955	650	0.1874	159.1933			
500	0.2825	239.9861	655	0.1669	141.7768			
505	0.3115	264.6154	660	0.1476	125.3882			
510	0.3366	285.9875	665	0.1285	109.1990			
515	0.3527	299.6115	670	0.1124	95.4728			
520	0.3665	311.3173	675	0.0977	83.0293			
525	0.3755	318.9597	680	0.0848	72.0275			
530	0.3807	323.4481	685	0.0738	62.7239			





**Calculated Efficacy Data for family models:**

Model Number	Luminous Flux (lm)	Power (W)	Efficacy (lm/W)
AST-SWP01C-200WBSPSA1-abc40	26390.6	198.06	133.25
AST-SWP01C-200WBSPSA1-abc45	26600.8	197.75	134.52
AST-SWP01C-200WBSPSA1-abc50	26811.0	197.75	135.58
AST-SWP01C-200WBSPSA1-abc57	27021.2	197.75	136.65
AST-SWP01C-200WBSPSA1-abc65	27231.4	197.43	137.93

\*1: This value is calculated and the calculation formula is as below:

$$26600.8 = ( 27231.4 - 26390.6 ) / 4 + 26390.6$$

$$26811.0 = ( 27231.4 - 26390.6 ) / 4 + 26600.8$$

$$27021.2 = ( 27231.4 - 26390.6 ) / 4 + 26811.0$$

\*2: This value is calculated and the calculation formula is as below:

$$197.75 = ( 198.06 + 197.75 ) / 2$$

\*3: This value is calculated and the calculation formula is as below:

$$134.52 = 26600.8 / 197.75$$

$$135.58 = 26811.0 / 197.75$$

$$136.65 = 27021.2 / 197.75$$

### 3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500C	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-25
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ200006	2022-01-25
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2022-01-18
Expand Uncertainty: Photometric Measurement (Sphere): 2.08%, k=2 Chromaticity Measurement(Sphere):25.6K, k=2 Photometric Measurement(Goniophotometer):2.645%, k=2			

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