



Report No.: BLC1809011E-U-B

LM-79-08 Test Report

For

Beyond LED Technology

(Brand Name: Beyond LED Technology)

1939 Parker Ct, Stone Mountain, GA 30087, USA

Architectural Flood and Spot Luminaires

Model name(s): BLT-SP01-600WEHT2H1-acd

Remark: "a" can be any two letters to represent lamp colors,
"c" can be "S" for Surge-Protective Device provided or blank for no Surge-Protective
Device provided,
"d" can be any two digits to represent CCT

Representative (Tested) Model: AST-SP01-600WEHT2H1-ac40
AST-SP01-600WEHT2H1-ac57

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

Test & Report By:

Grace Li

Engineer: Grace Li

Date: Sept 19, 2018

Review By:

Tommy Liang

Manager: Tommy Liang



Report No.: BLC1809011E-U-B

1.1 Product Information:

Organization Name	ASmart LIGHT CO., LTD	
Brand Name	ASmart	
Model Number	AST-SP01-600WEHT2H1-acc	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires	
Rated Voltage / Frequency	277-480Vac, 50/60 Hz	
Nominal Power	600W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,4500K,5000K,5700K	
LED Manufacturer	OSRAM	
LED Model	GW PUSTA1.PM	
Sample Number	BLC1809011E-U-B1(4000K),B2(5700K)	
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	Sept 13,2018
Date of Test	Sept 17,2018
Test item	<ol style="list-style-type: none">1. Total Luminous Flux2. Luminous Distribution Intensity3. Luminous Efficacy4. Correlated Color Temperature5. Color Rendering Index6. Chromaticity Coordinate7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none">1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources4. CIE 15-2004 Technical Report Colorimetry5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
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° 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 Electrical, Photometric and Chromaticity Measurements***(Refer to Work Instruction BL-QP-033)*

Test date	2018-09-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-SP01-600WEHT2H1-ac40		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180901	277.0	60	2.1288	588.49	0.998	4.59
1E-U-B1	480.0	60	1.2529	580.94	0.966	9.34
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

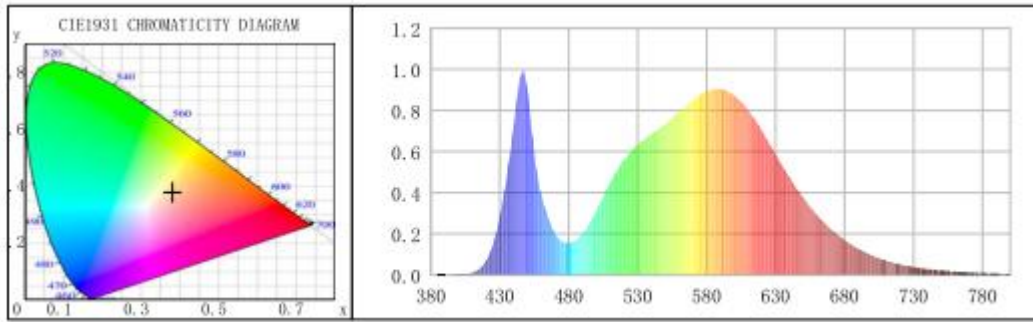
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	72	R9	0
Frequency (Hz)	60	R2	81	R10	55
CCT (K)	3993	R3	88	R11	72
Duv	0.00065	R4	75	R12	51
Chromaticity (x, y)	x=0.3812 y=0.3786	R5	72	R13	73
Chromaticity (u', v')	u(u')=0.2249 v'(v')=0.5025	R6	74	R14	93
Color Rendering Index (CRI)	74.7	R7	81	R15	65
R9	0	R8	54	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	87501.25	84108.7	>=30000(-10%)
Luminous Efficacy (lm/W)	148.69	144.78	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	142.92		
Zonal lumens in the 0-90° zone (%)	99.7	--	>=85(-3)
Beam Angle (°)	15.5	--	--
Center Beam Candle Power (cd)	580637	--	--



Spectral Power Distribution & Chromaticity Diagram

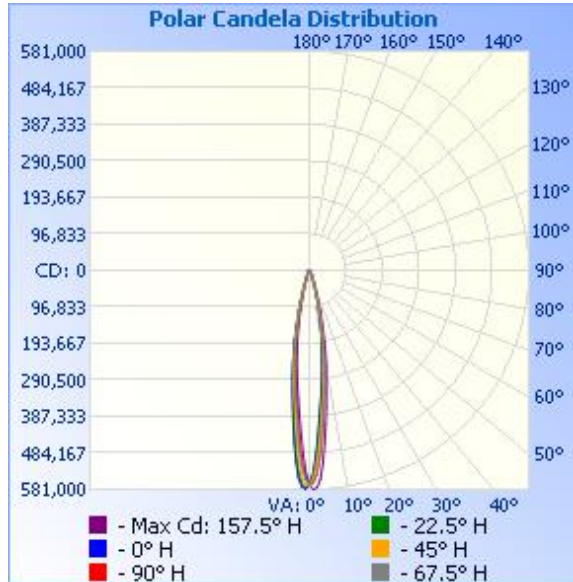


Zonal Lumen Tabulation

Zonal Lumen Summary				Lumens Per Zone					
Zone	Lumens	% Lamp	% Luminaire	Zone	Lumens	% Total	Zone	Lumens	% Total
0-30	64,900.8	74.2%	74.3%	0-10	32,059.5	36.7%	90-100	123.5	0.1%
0-40	69,679.6	79.6%	79.8%	10-20	25,438.0	29.1%	100-110	0	0%
0-60	77,244.1	88.3%	88.4%	20-30	7,403.4	8.5%	110-120	0	0%
60-90	10,002.2	11.4%	11.4%	30-40	4,778.8	5.5%	120-130	0	0%
70-100	6,375.0	7.3%	7.3%	40-50	3,803.6	4.4%	130-140	0	0%
90-120	123.5	0.1%	0.1%	50-60	3,760.9	4.3%	140-150	0	0%
0-90	87,246.3	99.7%	99.9%	60-70	3,750.7	4.3%	150-160	0	0%
90-180	123.5	0.1%	0.1%	70-80	3,458.2	4.0%	160-170	0	0%
0-180	87,369.8	99.8%	100%	80-90	2,793.2	3.2%	170-180	0	0%



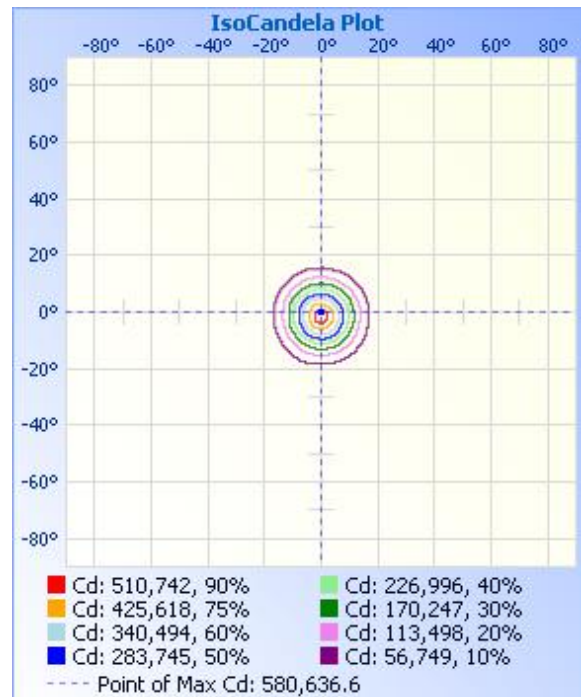
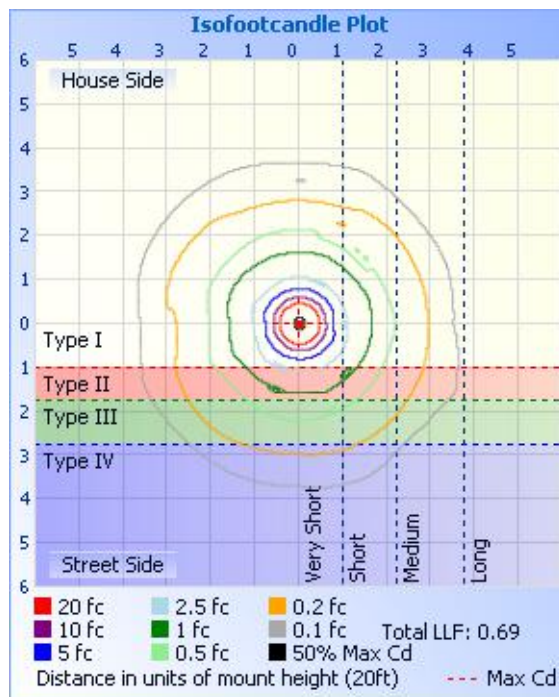
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	1,964 fc	4.7 ft	4.6 ft
34.0ft	491 fc	9.5 ft	9.2 ft
51.0ft	218 fc	14.2 ft	13.9 ft
68.0ft	123 fc	18.9 ft	18.5 ft
85.0ft	78.5 fc	23.7 ft	23.1 ft
102.0ft	54.5 fc	28.4 ft	27.7 ft

■ Vert. Spread: 15.9°
■ Horiz. Spread: 15.5°





Candela Table - Type C

	0	22.5	45	67.5	90	112.	135	157.5	180	202.	225	247.	270	292.	315	337.	360
						5				5		5		5		5	
0	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674	5674
	91	91	91	91	91	91	91	1	91	91	91	91	91	91	91	91	91
1	5377	5429	5520	5616	5631	5720	5790	5806	5796	5753	5670	5549	5523	5441	5377	5363	5377
	02	59	15	10	75	03	86	37	87	25	43	74	86	21	48	11	02
2	4888	5038	5173	5407	5417	5572	5709	57615	5738	5649	5480	5251	5199	5051	4944	4870	4888
	87	66	28	70	64	95	20	2	69	58	87	85	75	16	72	21	87
3	4344	4470	4725	5046	5044	5262	5456	55434	5513	5374	5126	4832	4733	4541	4423	4334	4344
	57	95	31	02	78	83	07	5	96	35	64	64	34	69	85	01	57
4	3837	3956	4227	4580	4570	4810	5040	51148	5090	4930	4613	4330	4209	4014	3911	3827	3837
	23	58	03	22	07	63	53	9	84	72	20	53	44	89	43	04	23
5	3424	3532	3769	4044	4061	4301	4527	46090	4591	4429	4116	3847	3731	3532	3441	3413	3424
	72	26	16	05	57	92	50	0	61	96	20	70	56	15	15	94	72
6	3072	3171	3375	3609	3576	3827	4021	41012	4087	3949	3686	3448	3304	3174	3080	3059	3072
	87	24	33	26	00	99	23	5	24	30	44	74	99	02	36	16	87
7	2712	2842	3019	3227	3199	3384	3550	36629	3649	3537	3321	3081	2969	2849	2757	2697	2712
	92	68	36	17	52	31	49	5	77	64	51	76	41	30	10	72	92
8	2398	2521	2650	2875	2847	3019	3173	32424	3228	3139	2953	2769	2651	2534	2443	2388	2398
	35	86	28	77	34	64	56	3	05	27	08	25	33	17	99	25	35
9	2099	2212	2330	2537	2510	2675	2823	28862	2874	2801	2629	2461	2349	2234	2145	2089	2099
	06	61	39	71	09	02	84	5	96	21	84	87	39	38	79	29	06
10	1812	1883	2025	2214	2194	2347	2489	25498	2538	2475	2317	2161	2057	1955	1860	1801	1812
	10	72	36	92	73	73	20	6	71	17	94	73	57	86	67	62	10
11	1544	1610	1729	1879	1887	2022	2153	22133	2210	2157	2007	1857	1772	1679	1557	1526	1544
	16	71	27	91	66	41	95	3	11	53	47	73	68	77	56	18	16
12	1300	1356	1457	1596	1584	1697	1814	19037	1901	1855	1723	1549	1476	1403	1305	1275	1300
	70	68	14	96	97	70	08	0	77	87	04	40	18	99	65	32	70
13	1058	1126	1177	1329	1323	1416	1523	16144	1604	1569	1453	1290	1220	1169	1073	1019	1058
	97	88	65	27	93	75	88	9	51	08	14	71	87	08	28	82	97
14	8601	9182	9476	1087	1096	1174	1269	13285	1310	1288	1190	1060	9901	9568	8685	8226	8601
	2	8	8	13	53	24	21	2	53	15	91	14	5	1	9	3	2
15	6971	7438	7577	8729	8922	9492	1030	11172	1089	1052	9770	8554	7878	7682	6929	6596	6971
	4	7	9	5	3	1	07	6	53	17	7	4	1	4	7	2	4
16	5586	5925	5966	6939	7230	7667	8413	90290	8615	8554	7948	6883	6240	6182	5541	5281	5586



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	5	6	5	6	8	2	7		2	5	4	3	9	7	0	6	5
17	4502	4801	4791	5501	5650	6137	6735	73293	6842	6832	6378	5506	4955	4923	4433	4203	4502
	6	9	1	5	9	1	9		0	5	6	4	3	1	7	6	6
18	3651	3890	3847	4288	4593	4831	5365	60271	5500	5460	5123	4261	3953	3903	3520	3410	3651
	0	3	3	4	2	9	6		7	3	3	1	4	5	2	2	0
19	3013	3241	3125	3489	3784	3921	4366	49213	4396	4254	4024	3477	3195	3177	2934	2769	3013
	1	4	4	9	4	7	0		5	3	5	0	9	2	3	9	1
20	2489	2722	2587	2938	3150	3239	3589	39593	3495	3424	3315	2877	2646	2656	2469	2386	2489
	1	2	2	8	6	5	4		1	9	4	7	6	0	8	4	1
21	2139	2231	2224	2500	2630	2725	2981	32602	2896	2847	2745	2447	2311	2247	2156	2089	2139
	8	6	7	1	1	9	9		2	3	3	1	7	3	1	4	8
22	1907	1964	1954	2112	2207	2295	2531	27591	2470	2418	2363	2114	2006	1958	1862	1815	1907
	4	1	8	9	6	9	3		4	4	6	5	9	6	4	7	4
23	1640	1714	1761	1892	1854	1981	2176	23524	2071	2051	2045	1907	1776	1715	1671	1650	1640
	7	1	5	8	5	4	1		1	2	8	2	0	5	7	2	7
24	1455	1544	1561	1687	1614	1733	1857	19982	1840	1823	1819	1687	1549	1530	1468	1489	1455
	1	7	9	1	5	7	8		3	3	0	1	7	1	7	4	1
25	1360	1362	1434	1561	1469	1555	1631	17538	1676	1601	1609	1516	1400	1384	1341	1314	1360
	0	7	1	8	7	9	7		6	7	8	8	3	2	0	6	0
26	1253	1240	1311	1434	1326	1397	1504	15327	1473	1448	1483	1388	1273	1285	1233	1223	1253
	9	8	2	8	3	9	0		8	2	6	2	5	5	4	4	9
27	1113	1166	1226	1309	1198	1300	1341	13873	1347	1345	1319	1303	1145	1156	1111	1113	1113
	6	4	5	5	1	7	0		5	3	2	1	3	3	9	5	6
28	1077	1107	1145	1205	1077	1176	1210	12543	1210	1229	1216	1200	1050	1100	1051	1043	1077
	7	9	1	1	4	1	3		2	8	9	2	2	1	9	9	7
29	9888	1043	1057	1116	1032	1109	1128	11275	1143	1122	1121	1142	9476	9816	9719	9976	9888
		0	2	7	1	2	8		2	1	1	4					
30	9233	9639	9295	1058	9899	1027	1079	10826	1016	1031	1022	1034	9355	9421	9089	9651	9233
				9		2	6		9	9	1	8					
31	8749	9385	9343	9785	9189	9299	9950	10470	9576	9923	9694	9689	8978	8767	8889	9125	8749
32	8188	8752	9247	9142	9174	8950	9473	9310	8936	9401	9231	9271	8420	8023	8412	8816	8188
33	7736	8531	8656	8950	8405	8175	8627	9017	8313	9053	8943	9062	7907	7886	8412	8305	7736
34	7533	7787	8289	8676	7454	8251	8458	8645	8094	8531	8880	8741	7318	7719	7859	7563	7533
35	7112	6964	8049	8805	6428	7309	8181	7949	7392	8072	8145	8516	6896	7324	7859	7254	7112
36	6472	6616	7267	7664	6519	7142	8643	7795	7221	6916	8368	8468	6368	6762	7505	6356	6472

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37	6301	6188	6612	7439	6066	6746	7305	7192	7081	7059	8448	7970	6141	6670	6105	6078	6301
38	6223	6204	6181	6989	4889	7096	6982	6820	6410	5935	7075	6861	5824	6230	6228	6047	6223
39	5911	5840	5989	6829	5553	6230	6367	6558	6488	6299	6915	6700	5658	5804	5644	4918	5911
40	5505	5444	5638	6315	5326	5333	6090	5893	5786	5793	5126	6652	5462	5713	4460	5614	5505
41	4616	5365	5286	6154	5040	5713	5367	5459	5630	5460	5669	6266	5538	5698	5260	5119	4616
42	5349	5112	5350	5752	5130	5105	5213	5057	5552	5571	5446	6282	4753	5500	4644	5104	5349
43	5053	3862	5158	6009	4874	5303	4491	5459	4975	5492	5478	5881	4285	5181	5136	5026	5053
44	4133	4653	5126	5624	5010	4482	4860	4856	5240	5001	5446	5126	4542	4847	4829	4810	4133
45	4445	5033	5206	4836	3712	4984	5136	5227	4882	5080	5286	5640	4361	4999	4598	4856	4445
46	4819	5191	4823	5045	4466	4802	4952	3604	4804	4922	4871	5190	4466	4315	4829	3789	4819
47	4117	4875	4759	4772	4829	4513	4567	4748	4788	4669	3881	5350	4346	4528	4952	4918	4117
48	4086	4970	4903	5511	4678	4103	4706	4547	4351	4542	4568	4981	4180	4376	4921	4965	4086
49	4460	4764	4695	4868	4361	4452	4368	4717	4133	4432	3897	5270	4874	4513	4368	4315	4460
50	4351	4606	4504	4965	3968	4680	4383	4733	4757	4970	4935	4354	4074	4118	3998	4779	4351
51	4180	4621	4743	4949	3516	4406	4368	4068	4008	4621	4807	4917	4436	4482	4614	4392	4180
52	4133	4384	4520	4997	3953	4680	4598	4501	4039	4827	4232	5029	3953	2568	4444	4470	4133
53	4071	4194	4631	4756	3727	2674	4598	4562	2854	3893	4312	4708	4270	3829	3645	4330	4071
54	4008	4226	4536	4852	4240	4300	3445	4191	4554	4004	4711	4965	3802	4224	4337	4068	4008
55	3837	3909	4584	4885	4180	4437	3968	3820	4507	4637	4344	4081	3968	4042	4260	4346	3837
56	4273	4115	3130	5013	3938	4589	4291	3866	3790	4226	4360	4531	3893	4072	4275	4191	4273
57	3899	4052	3322	4885	3486	3829	3583	3604	4429	4352	4232	4322	4089	4118	3937	3402	3899
58	3416	4147	3913	4804	4300	4452	4091	4454	4180	4242	4248	4852	3591	4209	3230	4129	3416
59	4133	4115	3769	3985	3984	4300	3399	4269	3946	4257	4408	5061	3787	4103	3506	4083	4133
60	3993	4052	4360	4547	4044	4285	4152	4191	3712	2833	4472	4515	3108	4315	3983	3866	3993
61	3852	4052	3178	4676	3818	3085	3952	3542	4227	4257	4184	4772	3893	3935	4091	3743	3852
62	4071	4115	3641	4579	3727	3753	3968	4346	4320	3925	4344	3792	3636	4027	3168	3325	4071
63	3915	4036	3769	4644	3953	3571	2860	3681	3899	4289	4040	4644	3984	3981	3414	3526	3915
64	3727	3339	4248	4451	3923	4239	3076	2583	4180	3735	3865	4435	3305	4179	3783	4129	3727
65	4102	4036	3833	3294	4165	3297	3937	3727	3977	4242	3881	4354	3184	4133	3014	3959	4102
66	3961	3688	3849	4065	3516	3753	3522	3743	3228	3814	3913	4145	3878	3905	4245	3851	3961
67	3416	3181	3737	4033	3093	3966	3722	3774	3369	4099	3993	4258	3033	3358	3522	2908	3416
68	2854	3878	3290	4467	3425	3905	3799	1887	3790	3988	3993	3069	3682	3312	3614	3557	2854

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69	3213	3783	3513	3840	3606	3738	3491	3279	3868	3846	3066	4435	3546	4118	3660	3542	3213
70	3104	3434	3705	4194	3229	4042	3583	3062	3915	3925	3721	4274	3139	2948	3476	3712	3104
71	3494	3814	3721	4081	3471	3662	3676	3279	2308	3086	4056	4386	2912	3586	3552	3433	3494
72	3556	3767	3753	3165	3093	2933	3583	3851	3088	3245	4120	4435	3576	3799	3998	3836	3556
73	3244	3798	2603	4081	3652	2583	3552	3341	2152	3783	3210	3856	3395	3753	3322	3495	3244
74	3291	3324	3625	4113	2822	3054	3368	3604	3634	3798	3625	4081	3486	3312	3322	3542	3291
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77	3104	3688	2875	3663	2626	3069	2122	3402	3197	3245	2220	4097	2942	3358	2876	2815	3104
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84	2215	2580	2587	2635	2580	2644	1984	2536	2620	2501	2970	3117	1977	2765	2522	2273	2215
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86	2027	2263	2396	2249	2444	2522	2307	2768	2667	2453	2603	2876	2309	2416	2414	2505	2027
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88	1809	2643	2428	2201	2128	2674	2076	2072	2074	2374	2507	2748	2263	2462	2476	2273	1809
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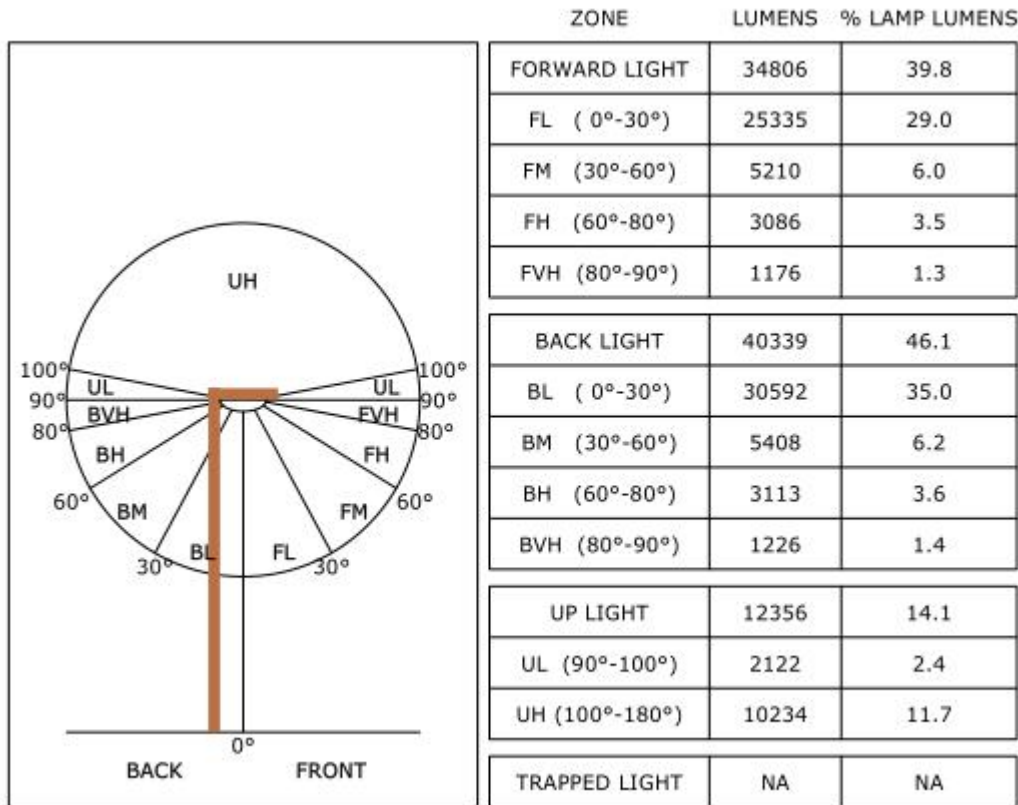
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**2.2 Electrical, Photometric and Chromaticity Measurements***(Refer to Work Instruction BL-QP-033)*

Test date	2018-09-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-SP01-600WEHT2H1-ac57		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180901	277.0	60	2.1288	588.68	0.9983	4.61
1E-U-B2	480.0	60	1.2528	581.12	0.9664	9.41
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	71	R9	0
Frequency (Hz)	60	R2	76	R10	43
CCT (K)	5616	R3	80	R11	73
Duv	0.00298	R4	75	R12	47
Chromaticity (x, y)	x=0.3298 y=0.3446	R5	73	R13	71
Chromaticity (u', v')	u(u')=0.2037 v'(v')=0.4789	R6	69	R14	89
Color Rendering Index (CRI)	72.8	R7	80	R15	65
R9	0	R8	60	--	--

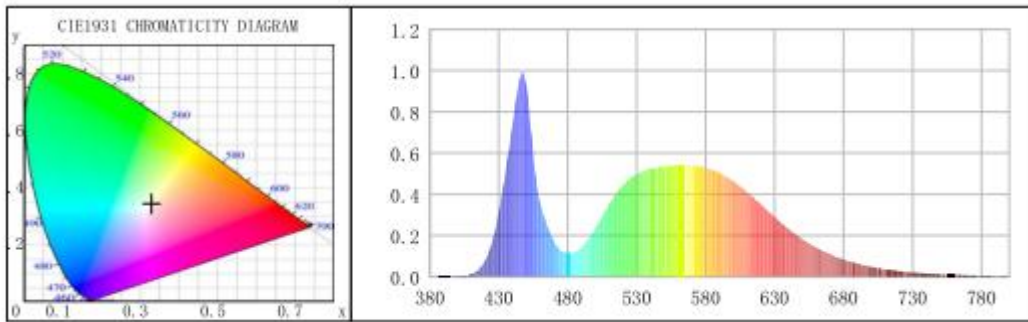
Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	277.0	480.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	89638.30	86232.40	$\geq 30000(-10\%)$
Luminous Efficacy (lm/W)	152.27	148.39	Premium: $\geq 120(-3\%)$
Most worst Luminous/Highest Watts	146.48		



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Spectral Power Distribution & Chromaticity Diagram





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Calculated Efficacy Data for family models (4500K and 5000K):

Model Number	Luminous Flux (lm)	Power (W)	Efficacy (lm/W)
AST-SP01-600WEHT2H1-ac40	87501.25	588.49	148.69
AST-SP01-600WEHT2H1-ac45	88035.51	588.59	149.57
AST-SP01-600WEHT2H1-ac50	88569.78	588.59	150.48
AST-SP01-600WEHT2H1-ac57	89638.30	588.68	152.27



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3. Test Equipment

Equipment Name	Model No.	Serial No.	Next Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2019-01-15
AC Power Source	CHP-500C	N/A	2019-01-14
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2019-01-22
Digital Power Meter	WT500	DYDWQ200006	2019-01-14
Integral Sphere (2M)	2M	DYJCE120067	2019-01-15
Digital Power Meter	WT500	DYDWQ200006	2019-01-14
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2019-01-15

Expand Uncertainty:
Photometric Measurement (Sphere): 2.04%, k=2
Chromaticity Measurement(Sphere):28.8K, k=2
Photometric Measurement(Goniophotometer):2.7%, k=2

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