LM-79-08 Test Report

For

Beyond LED Technology

(Brand Name: Beyond)

1939 Parker Court, Stone Mountain, GA 30087

Outdoor Pole/Arm-Mounted Area and Roadway Luminaires

Architectural Flood and Spot Luminaires

Model name(s): BLT-FL21-300WBH6SA1-BR3NP10SPWR50

Remark: "a" can be any two letters for Lamp colors; "b" can be "3RP", "3NP", "5RP", "5NP", "7RP", "7NP" for AC photocontrol provided, "P" for DC photocontrol provided or blank for no photocontrol provided; "c" can be "10SP", "20SP" or blank for Surge protector type provided or not; "d" can be "AM", "YM", "FM" for Bracket type; "W" for wattage adjustable; "f" can be "DM", "DP" or blank for Microware Motion Sensor, PIR Motion Sensor provided or not; "R" for Reflector provided ; "h" can be "30"."35""40""45""50""57" for 3000K,3500K,4000K,4500K,5000K,5700K,or "30/40/50"for 3000K/4000K/5000K.

Representative (Tested) Model:
AST-FL21-300WBH6SA1-abcdWfR30
AST-FL21-300WBH6SA1-abcdWfR57

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

Test & Report By:

Winny Wu

Engineer: Winny Wu

Date: 2023-09-15

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	Beyond LED Technology	
Brand Name	Beyond LED Technology	
Model Number	BLT-FL21-300WBH6SA1-BR3NP10SPWR50	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires Architectural Flood and Spot Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	300W(Power adjustable)	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,4500K,5000K,5700K	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-3080RC35003P1 L128-5780RC35003P1	
Sample Number	UTC2309010E-BB1-2	
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	2023-09-09
Date of Test	2023-09-11
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. 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° C ± 1° 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.
Goniophotometer far field detector f1'=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 25º C ± 1º 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-FL21-300WBH6SA1-abcdWfR30:1.022
AST-FL21-300WBH6SA1-abcdWfR57:1.025

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 25º C ± 1º 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	2023-09-11	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-FL21-300WBH6SA1-BR3NP10SPWR50		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230901	120.0	60	2.527	302.91	0.999	4.36
0E-BB 1	277.0	60	1.111	294.85	0.958	6.98
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

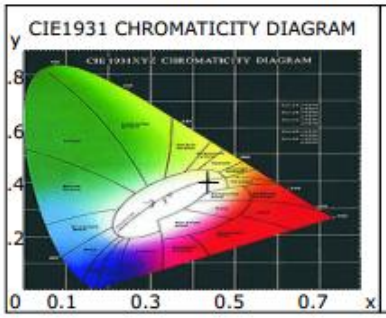
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2968
Duv	-0.0007
Chromaticity (x, y)	x=0.4382 y=0.4028
Chromaticity (u', v')	u(u')=0.2519 v'=0.5211
Color Rendering Index (CRI)	82
R9	3
Rf	84
Rg	96
Rcs,h1(%)	-12

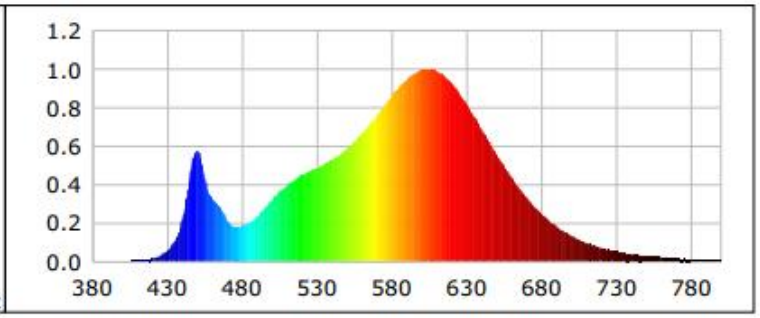
R1	80	R9	3
R2	91	R10	80
R3	96	R11	80
R4	80	R12	73
R5	81	R13	83
R6	90	R14	98
R7	81	R15	73
R8	57	--	--
--	--	--	--
--	--	--	--

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)	42957.3	41811.4	>=10000(-10%)
Luminous Efficacy (lm/W)	141.82	141.81	Premium: >= 120(-3%)
Most worst Luminous/Highest	138.03		
Zonal lumens in the 0-90° zone (%)	100	--	Category 1: >=100(-1) Category 2: >=85(-3)
Zonal lumens in the 80-90°zone (%)	0.1	--	<=10(+3)
Beam Angle (°)	80.5	--	--
Center Beam Candle Power (cd)	26764	--	--

Spectral Power Distribution & Chromaticity Diagram



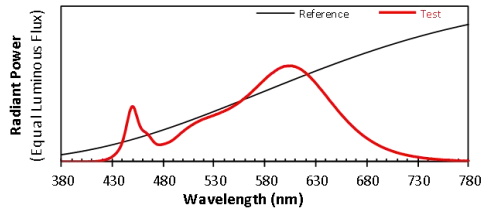


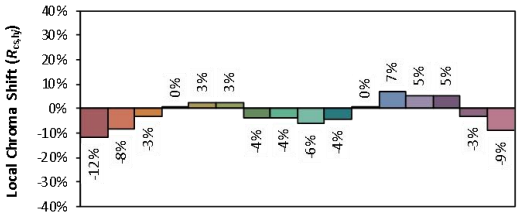
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.2242	535	0.4671	390.1805	690	0.3303	275.9045
385	0.0003	0.2386	540	0.4850	405.1574	695	0.2866	239.3827
390	0.0003	0.2091	545	0.5052	422.0349	700	0.2465	205.9465
395	0.0006	0.5184	550	0.5292	442.0555	705	0.2127	177.6425
400	0.0007	0.5721	555	0.5543	463.0565	710	0.1818	151.8729
405	0.0011	0.9117	560	0.5857	489.2946	715	0.1553	129.7334
410	0.0033	2.7433	565	0.6211	518.8640	720	0.1327	110.8719
415	0.0070	5.8490	570	0.6624	553.3545	725	0.1125	94.0143
420	0.0141	11.7526	575	0.7080	591.4482	730	0.0956	79.8509
425	0.0282	23.5831	580	0.7581	633.3305	735	0.0815	68.0446
430	0.0545	45.5146	585	0.8098	676.4948	740	0.0692	57.8007
435	0.1049	87.6656	590	0.8615	719.6664	745	0.0592	49.4415
440	0.2101	175.4705	595	0.9067	757.3971	750	0.0503	42.0163
445	0.4262	355.9949	600	0.9481	792.0504	755	0.0418	34.9345
450	0.5782	482.9743	605	0.9772	816.3190	760	0.0364	30.3910
455	0.4420	369.2671	610	0.9957	831.7717	765	0.0304	25.3855
460	0.3271	273.2759	615	1.0000	835.3709	770	0.0253	21.1509
465	0.2862	239.1159	620	0.9897	826.7368	775	0.0214	17.9040
470	0.2177	181.8388	625	0.9659	806.8826	780	0.0182	15.1758
475	0.1794	149.8734	630	0.9261	773.6235	785	0.0158	13.1879
480	0.1835	153.2544	635	0.8769	732.4995	790	0.0130	10.8306
485	0.2018	168.5649	640	0.8182	683.4607	795	0.0116	9.6779
490	0.2314	193.3047	645	0.7545	630.3154	800	0.0093	7.7925
495	0.2758	230.3730	650	0.6892	575.7207			
500	0.3206	267.8064	655	0.6208	518.6159			
505	0.3609	301.4996	660	0.5567	465.0436			
510	0.3952	330.1663	665	0.4934	412.1552			
515	0.4236	353.8904	670	0.4345	362.9413			
520	0.4468	373.2077	675	0.3792	316.7656			
525	0.4671	390.1805	680	0.3303	275.9045			
530	0.4850	405.1574	685	0.2866	239.3827			

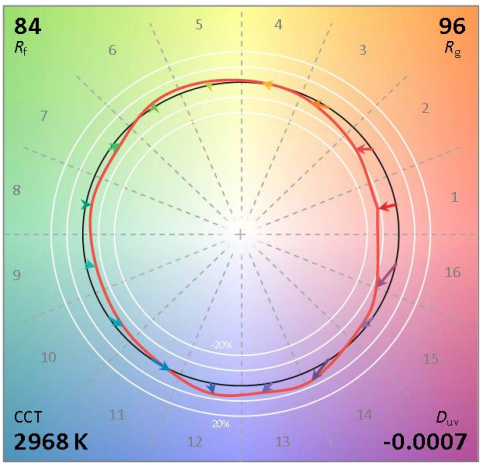
TM30

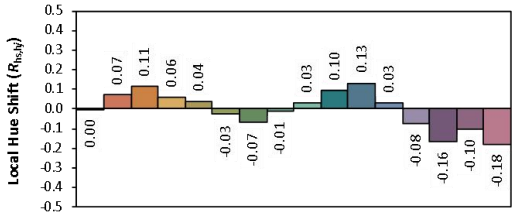
ANSI/IES TM-30-18 Color Rendition Report

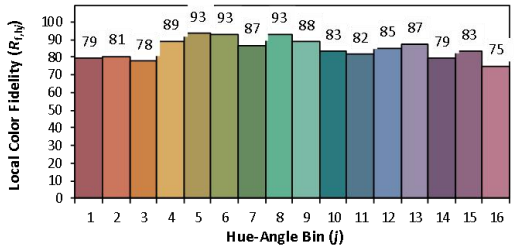
Source:	L128-3080RC35003P1	Manufacturer:	ASMART LIGHT CO., LTD
Date:	2023/9/11	Model:	AST-FL21-300WBH6SA1-abcdWfR30

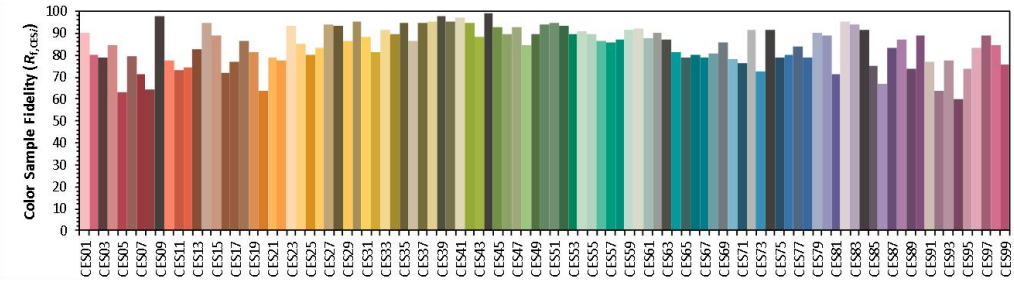












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4382
y	0.4028
u'	0.2520
v'	0.5211

CIE 13.3-1995 (CRI)

R_a	82
R_9	3

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

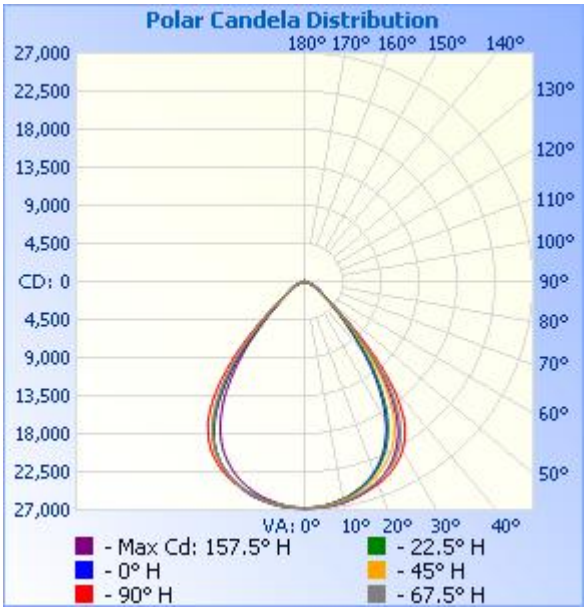
Zonal Lumen Tabulation

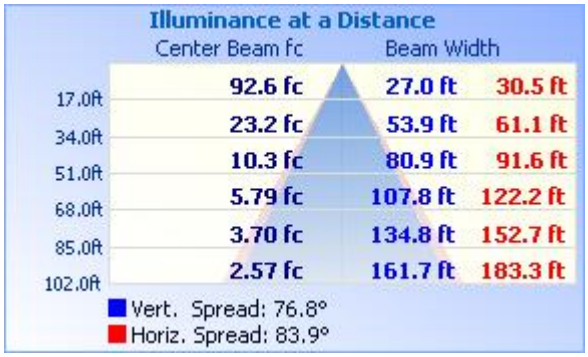
Zone	Lumens	% Lamp	% Luminaire
0-30	20,583.9	47.9%	47.9%
0-40	31,919.8	74.3%	74.3%
0-60	41,014.8	95.5%	95.5%
60-90	1,778.9	4.1%	4.1%
70-100	564.5	1.3%	1.3%
90-120	33.8	0.1%	0.1%
0-90	42,793.7	99.6%	99.6%
90-180	156.4	0.4%	0.4%
0-180	42,950.1	100%	100%

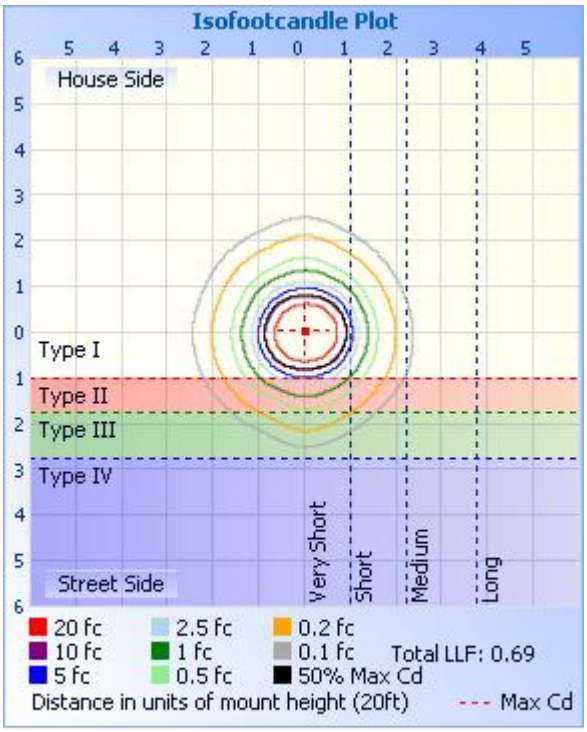
Lumens Per Zone

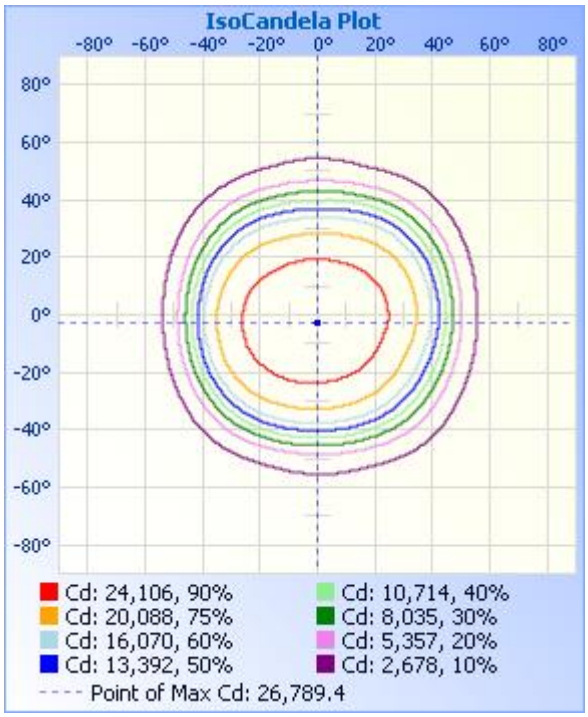
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	2,533.2	5.9%	90-100	11.5	0%
10-20	7,253.1	16.9%	100-110	11.0	0%
20-30	10,797.6	25.1%	110-120	11.3	0%
30-40	11,335.8	26.4%	120-130	15.4	0%
40-50	6,672.2	15.5%	130-140	21.8	0.1%
50-60	2,422.8	5.6%	140-150	28.4	0.1%
60-70	1,225.9	2.9%	150-160	28.5	0.1%
70-80	490.7	1.1%	160-170	20.9	0%
80-90	62.3	0.1%	170-180	7.6	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	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764	26764
1	26741	26749	26755	26766	26768	26782	26764	26775	26779	26762	26763	26749	26751	26751	26737	26736	26741
2	26712	26731	26733	26764	26764	26784	26764	26786	26785	26756	26750	26723	26738	26722	26705	26703	26712
3	26670	26687	26705	26753	26751	26780	26765	26789	26783	26748	26719	26689	26706	26685	26673	26667	26670
4	26623	26648	26669	26733	26733	26766	26747	26787	26771	26719	26681	26653	26655	26644	26617	26625	26623
5	26569	26590	26621	26710	26701	26740	26736	26760	26756	26680	26643	26616	26609	26589	26569	26555	26569
6	26502	26523	26569	26667	26672	26721	26714	26729	26706	26637	26598	26553	26538	26516	26502	26467	26502
7	26410	26444	26506	26626	26630	26699	26688	26700	26649	26587	26543	26500	26468	26448	26427	26398	26410
8	26312	26351	26431	26569	26581	26655	26649	26645	26585	26518	26485	26430	26395	26365	26348	26296	26312
9	26208	26238	26352	26506	26534	26601	26593	26581	26510	26447	26414	26350	26313	26289	26258	26179	26208
10	26097	26127	26258	26434	26464	26543	26534	26532	26424	26367	26324	26263	26226	26194	26155	26076	26097
11	25965	25998	26141	26346	26390	26475	26469	26447	26336	26269	26223	26185	26140	26084	26027	25956	25965
12	25803	25862	26032	26240	26307	26392	26381	26358	26233	26162	26125	26089	26049	25986	25911	25798	25803
13	25638	25693	25899	26132	26212	26293	26270	26261	26138	26039	26003	25962	25947	25871	25778	25638	25638
14	25459	25527	25754	26015	26114	26176	26171	26147	26012	25907	25885	25842	25841	25753	25632	25465	25459
15	25253	25352	25594	25890	26001	26067	26048	26023	25870	25787	25746	25709	25729	25625	25477	25279	25253
16	25037	25154	25417	25749	25900	25962	25913	25887	25699	25618	25604	25562	25618	25499	25320	25086	25037
17	24812	24923	25216	25601	25777	25846	25782	25725	25522	25450	25452	25407	25490	25361	25131	24869	24812
18	24564	24692	25015	25450	25667	25723	25633	25561	25341	25267	25281	25227	25346	25210	24928	24642	24564
19	24288	24443	24805	25292	25555	25595	25446	25394	25143	25075	25082	25058	25205	25043	24740	24384	24288
20	23994	24173	24576	25143	25433	25456	25270	25199	24909	24846	24881	24867	25034	24873	24525	24119	23994
21	23646	23863	24336	24974	25292	25301	25090	24982	24675	24617	24667	24655	24865	24664	24296	23830	23646
22	23308	23539	24064	24802	25140	25154	24889	24749	24435	24376	24435	24430	24677	24461	24056	23506	23308
23	22941	23156	23790	24583	24945	24984	24675	24479	24179	24100	24183	24182	24472	24251	23765	23187	22941
24	22528	22784	23496	24385	24761	24793	24462	24201	23890	23818	23922	23887	24256	24021	23483	22813	22528
25	22078	22378	23181	24146	24553	24599	24204	23919	23580	23519	23612	23595	23993	23763	23183	22434	22078
26	21597	21923	22840	23875	24293	24359	23964	23604	23203	23160	23295	23277	23727	23476	22862	22028	21597
27	21066	21426	22473	23562	24031	24112	23693	23217	22828	22794	22952	22924	23439	23157	22507	21565	21066

28	20499	20884	22079	23213	23754	23830	23389	22833	22404	22399	22579	22547	23122	22813	22091	21068	20499
29	19910	20313	21640	22829	23428	23503	23076	22404	21939	21959	22162	22075	22781	22446	21685	20521	19910
30	19211	19709	21122	22407	23067	23154	22672	21940	21428	21474	21660	21610	22374	22033	21225	19940	19211
31	18529	19053	20596	21935	22689	22711	22273	21427	20870	20887	21163	21110	21967	21592	20723	19321	18529
32	17786	18355	20014	21356	22242	22279	21834	20877	20195	20308	20631	20569	21494	21093	20173	18652	17786
33	16997	17601	19364	20766	21778	21786	21319	20187	19513	19656	20033	19971	20979	20526	19567	17914	16997
34	16175	16805	18648	20112	21226	21231	20736	19485	18768	18956	19382	19268	20469	19925	18919	17207	16175
35	15321	15998	17879	19401	20606	20602	20009	18724	17950	18193	18585	18555	19853	19277	18224	16416	15321
36	14449	15084	16973	18619	19898	19825	19255	17902	17082	17274	17795	17794	19099	18504	17405	15509	14449
37	13555	14203	16074	17664	19039	19042	18429	17015	16075	16407	16960	16982	18340	17728	16603	14640	13555
38	12633	13288	15110	16790	18154	18155	17507	15971	15109	15496	16073	16027	17484	16859	15715	13718	12633
39	11680	12429	14179	15741	17159	17155	16491	14963	14094	14519	15128	15097	16533	16009	14763	12759	11680
40	10741	11457	13108	14617	16069	16070	15291	13906	13032	13514	14046	14132	15627	15006	13754	11808	10741
41	9749	10426	12054	13475	14882	14875	14116	12785	11922	12465	13014	13117	14484	13986	12727	10870	9749
42	8884	9509	11033	12219	13640	13496	12916	11650	10836	11284	11983	12096	13413	12840	11690	9933	8884
43	8103	8609	9900	11051	12251	12235	11722	10415	9687	10220	10956	10976	12302	11751	10649	8886	8103
44	7348	7726	8869	9881	10986	10973	10419	9327	8728	9193	9856	9973	11151	10634	9627	7993	7348
45	6638	6909	7993	8753	9729	9596	9258	8285	7789	8113	8864	8981	9980	9537	8659	7141	6638
46	5992	6194	6994	7725	8517	8397	8159	7303	6934	7196	7937	8028	8866	8525	7654	6404	5992
47	5428	5497	6189	6792	7300	7297	7143	6342	6093	6370	7063	7137	7742	7480	6816	5747	5428
48	4877	4929	5469	5940	6289	6281	6209	5550	5401	5614	6244	6295	6823	6597	6053	5087	4877
49	4409	4412	4809	5102	5429	5415	5326	4868	4816	4962	5459	5473	5974	5785	5358	4542	4409
50	3965	3937	4232	4499	4690	4607	4638	4287	4271	4337	4826	4815	5198	5042	4727	4080	3965
51	3631	3540	3731	3892	4058	3979	4038	3773	3847	3842	4263	4232	4516	4413	4163	3603	3631
52	3353	3151	3274	3426	3491	3459	3537	3311	3494	3426	3776	3726	3951	3836	3651	3222	3353
53	3092	2865	2928	3039	3062	3022	3103	2961	3194	3068	3360	3252	3443	3389	3273	2902	3092
54	2866	2629	2635	2718	2720	2667	2720	2669	2941	2773	2972	2897	3062	3011	2950	2621	2866
55	2697	2412	2388	2428	2438	2350	2435	2426	2725	2505	2685	2602	2738	2695	2651	2376	2697
56	2536	2237	2181	2210	2188	2122	2202	2210	2531	2301	2450	2334	2467	2439	2418	2176	2536
57	2411	2067	1985	2025	1997	1926	2004	2037	2381	2126	2251	2136	2251	2209	2235	2016	2411
58	2287	1930	1826	1873	1835	1762	1839	1890	2251	1976	2065	1967	2058	2036	2041	1855	2287

59	2163	1806	1675	1742	1698	1608	1685	1766	2138	1848	1926	1825	1910	1885	1892	1734	2163
60	2060	1691	1551	1612	1576	1494	1562	1654	2033	1725	1802	1699	1780	1757	1741	1613	2060
61	1956	1580	1444	1512	1466	1390	1458	1547	1934	1623	1695	1592	1668	1647	1629	1505	1956
62	1855	1466	1325	1421	1369	1297	1359	1457	1849	1535	1586	1492	1569	1542	1508	1392	1855
63	1753	1365	1232	1332	1288	1203	1275	1376	1763	1443	1496	1408	1484	1451	1400	1301	1753
64	1634	1269	1132	1241	1199	1122	1187	1297	1670	1362	1408	1324	1394	1369	1309	1205	1634
65	1513	1168	1040	1160	1109	1046	1108	1218	1573	1283	1320	1250	1318	1287	1207	1116	1513
66	1403	1075	952	1080	1034	976	1029	1133	1484	1207	1228	1173	1239	1195	1111	1027	1403
67	1275	977	866	1004	962	902	955	1061	1383	1131	1137	1094	1165	1118	1014	933	1275
68	1148	876	782	922	897	834	882	988	1273	1050	1062	1024	1089	1043	925	847	1148
69	1021	780	706	845	833	769	814	898	1149	972	982	952	1021	971	832	763	1021
70	921	694	627	779	774	710	747	824	1053	894	899	889	959	892	746	674	921
71	812	605	554	702	719	648	675	750	949	816	813	818	897	816	664	605	812
72	719	535	486	629	661	586	609	674	852	727	728	754	843	746	585	529	719
73	635	451	419	548	603	529	541	602	744	650	651	693	780	671	504	461	635
74	545	385	360	480	542	474	477	524	649	576	575	625	727	594	428	389	545
75	468	324	292	415	481	424	410	455	563	495	494	567	666	524	358	339	468
76	364	278	242	350	423	380	354	386	476	420	424	508	599	453	293	297	364
77	225	209	194	289	378	317	302	328	398	364	368	447	540	383	241	240	225
78	117	133	155	241	313	276	256	268	321	299	308	388	475	318	187	154	117
79	38	74	128	194	270	234	218	223	263	244	263	339	414	268	151	85	38
80	32	46	102	152	219	192	175	179	206	195	216	285	359	216	125	45	32
81	21	21	69	120	167	153	141	138	154	150	175	241	293	168	85	26	21
82	17	11	41	90	131	116	105	106	117	119	136	193	239	129	57	20	17
83	18	19	33	57	92	86	87	76	87	86	105	146	192	100	26	16	18
84	18	14	26	47	60	59	40	52	62	65	81	111	139	68	24	16	18
85	15	15	21	29	39	42	29	41	39	43	54	79	100	47	20	14	15
86	12	13	18	21	24	25	26	31	30	28	33	55	67	28	16	14	12
87	15	14	13	19	14	14	18	23	19	23	21	33	37	17	11	11	15
88	11	12	21	16	11	14	12	17	22	19	23	25	22	13	10	12	11
89	14	14	16	16	7	9	11	14	18	17	16	16	12	16	11	12	14

90	10	11	14	13	8	0	15	13	16	18	16	15	0	9	12	13	10
91	0	16	14	16	0	7	11	15	11	16	11	9	8	12	14	13	0
92	11	10	12	11	9	0	11	14	14	13	12	13	8	0	11	16	11
93	11	13	13	13	0	7	11	11	14	14	13	15	9	8	11	10	11
94	11	11	14	13	7	8	11	13	16	14	13	13	11	10	9	8	11
95	11	13	17	11	13	7	10	11	15	12	12	13	7	9	9	11	11
96	9	13	13	9	9	10	8	9	14	13	13	16	9	13	11	14	9
97	13	14	12	11	10	0	9	0	11	15	12	12	0	10	12	14	13
98	11	13	11	13	9	8	9	7	9	11	13	16	0	12	9	11	11
99	11	14	0	12	0	0	11	9	9	13	12	12	9	9	9	8	11
100	9	9	16	12	11	0	9	8	11	14	7	10	0	9	9	11	9
101	11	14	13	15	0	11	10	12	12	11	10	15	0	11	12	10	11
102	14	11	16	13	8	10	8	0	14	13	11	11	9	8	11	11	14
103	11	12	13	13	10	0	9	9	12	14	12	14	9	8	11	10	11
104	10	11	15	11	0	8	0	11	11	9	11	13	0	8	12	13	10
105	12	16	15	14	0	8	11	14	12	14	13	11	8	7	9	12	12
106	11	14	13	16	9	11	0	13	11	14	12	13	9	8	9	12	11
107	13	12	16	15	10	9	9	9	9	12	13	13	9	11	11	11	13
108	11	12	16	11	9	8	12	0	12	8	12	14	9	0	11	11	11
109	11	11	13	16	11	0	11	9	11	14	9	0	12	13	9	14	11
110	0	14	16	18	10	11	12	10	12	13	11	15	8	10	11	12	0
111	13	12	14	16	11	7	9	9	14	11	12	12	8	11	11	11	13
112	11	11	13	13	11	8	11	14	14	14	13	11	0	12	9	11	11
113	15	11	12	15	0	9	9	8	15	15	8	12	0	10	11	11	15
114	12	14	13	16	9	12	9	11	15	13	11	13	8	12	11	10	12
115	16	16	14	13	9	11	9	10	14	14	8	13	7	12	11	14	16
116	16	14	13	13	7	8	11	10	15	14	11	14	8	10	11	14	16
117	11	7	11	13	9	9	12	12	15	16	11	15	11	9	11	16	11
118	12	14	17	14	9	0	11	0	14	17	13	11	12	11	14	11	12
119	13	11	16	14	7	10	9	14	15	12	13	0	14	12	0	13	13
120	14	16	14	10	9	7	11	12	16	14	13	16	12	12	16	17	14

121	16	14	15	14	15	12	15	14	15	17	16	20	9	12	10	15	16
122	14	17	16	20	15	12	16	14	19	17	16	18	13	13	11	15	14
123	16	15	17	18	14	15	15	16	17	22	19	17	12	14	14	14	16
124	18	16	15	20	14	12	18	14	14	19	13	20	14	15	16	19	18
125	13	18	15	20	16	14	16	16	16	20	8	20	14	14	15	19	13
126	17	16	20	20	14	17	17	16	14	21	18	18	14	18	16	18	17
127	18	19	23	23	18	17	20	19	22	20	21	18	16	20	18	23	18
128	20	21	18	19	16	24	14	24	22	23	18	25	17	17	18	20	20
129	23	24	24	18	19	19	22	18	19	28	20	25	16	17	16	24	23
130	21	21	21	21	21	20	24	25	21	24	26	24	16	21	25	22	21
131	21	19	17	25	19	15	27	25	21	24	23	24	20	21	22	23	21
132	24	25	13	25	19	27	20	25	26	24	29	23	24	21	21	15	24
133	19	22	23	26	21	27	29	34	28	31	28	33	22	29	26	24	19
134	25	24	22	25	26	29	34	31	29	29	22	30	22	22	24	27	25
135	25	31	23	25	29	25	32	32	31	31	31	34	25	28	27	22	25
136	21	27	26	31	30	33	20	36	36	35	35	37	27	27	27	25	21
137	25	26	25	31	33	27	44	39	34	41	36	38	32	30	29	31	25
138	29	23	32	28	29	33	36	39	37	39	36	33	34	33	32	31	29
139	34	31	35	35	32	36	39	36	39	44	42	30	37	37	33	30	34
140	36	36	35	36	34	33	37	34	44	29	41	45	37	38	34	24	36
141	42	36	38	38	31	36	39	38	33	46	47	40	38	37	40	38	42
142	32	39	37	39	40	40	39	45	40	50	47	42	42	38	38	41	32
143	44	41	40	36	43	43	44	46	45	49	50	47	39	41	39	41	44
144	40	32	37	42	37	40	39	49	51	39	50	42	40	39	42	41	40
145	42	44	47	44	39	44	54	50	50	54	53	50	44	46	44	43	42
146	49	49	47	47	44	43	50	56	52	53	53	44	47	43	39	47	49
147	49	46	41	50	50	46	52	52	55	51	53	57	48	44	46	51	49
148	52	50	53	43	46	46	57	46	56	59	46	54	49	54	51	49	52
149	52	53	52	52	55	40	61	58	59	58	61	52	48	51	53	54	52
150	49	50	54	57	52	51	60	60	57	49	62	56	52	54	50	45	49
151	52	44	52	55	55	56	59	61	58	60	62	59	54	56	59	59	52

152	56	51	59	55	57	50	64	64	60	66	62	59	60	58	55	61	56
153	59	57	59	59	53	61	55	66	66	66	69	62	56	60	54	59	59
154	57	49	59	60	50	60	67	71	61	61	69	65	51	62	62	60	57
155	64	62	59	59	60	61	69	65	67	58	69	67	57	63	59	53	64
156	60	60	58	64	62	64	71	64	69	66	69	60	64	60	64	60	60
157	58	62	60	63	61	67	69	70	69	74	71	60	66	65	64	67	58
158	67	67	64	54	67	52	69	72	71	65	70	70	66	65	67	64	67
159	69	67	63	65	62	63	70	74	69	71	69	65	58	67	65	64	69
160	64	66	69	59	65	67	76	78	69	71	75	73	67	72	61	66	64
161	68	66	64	63	55	68	75	76	73	79	74	74	72	67	65	66	68
162	67	61	71	67	67	71	78	76	79	77	79	77	68	70	69	69	67
163	72	67	69	64	70	77	77	77	75	84	86	76	71	59	74	74	72
164	69	71	61	69	71	72	75	75	69	78	80	75	65	69	71	74	69
165	74	72	74	67	70	69	80	81	81	79	81	75	73	72	66	76	74
166	69	72	71	71	75	80	78	84	77	84	80	78	67	71	73	74	69
167	77	70	73	70	72	77	82	85	83	84	84	82	70	72	74	78	77
168	79	73	74	72	73	74	85	85	83	87	85	84	71	77	74	75	79
169	79	79	78	74	75	83	84	90	85	91	90	84	73	81	70	77	79
170	68	78	76	70	73	83	83	90	84	83	88	78	76	82	74	79	68
171	77	75	76	74	80	82	82	86	84	89	83	85	76	64	80	73	77
172	74	75	69	76	79	81	82	89	81	88	89	84	74	77	74	76	74
173	78	74	75	76	72	82	80	87	77	86	91	87	74	74	69	77	78
174	77	74	74	73	72	80	85	90	84	94	87	84	70	79	75	75	77
175	77	79	76	80	81	80	80	90	86	91	89	86	67	74	78	75	77
176	80	79	78	74	76	77	81	84	82	94	88	82	74	70	73	76	80
177	78	79	79	78	78	76	81	88	82	87	88	80	72	72	77	78	78
178	81	75	76	74	80	71	80	81	82	84	83	79	72	74	81	79	81
179	79	79	77	79	75	79	80	84	84	79	87	83	72	78	75	77	79
180	80	84	79	79	75	77	81	79	77	80	83	79	77	82	80	77	80

BUG Rating

Lum. Classification System (LCS)

LCS Zone	Lumens	%Lamp	%Lum
FL (0-30)	10174.8	23.7	23.7
FM (30-60)	9891.1	23.0	23.0
FH (60-80)	824.5	1.9	1.9
FVH (80-90)	22.5	0.1	0.1
BL (0-30)	10409.9	24.2	24.2
BM (30-60)	10546.1	24.6	24.6
BH (60-80)	892.1	2.1	2.1
BVH (80-90)	39.9	0.1	0.1
UL (90-100)	11.5	0.0	0.0
UH (100-180)	145.0	0.3	0.3
Total	42957.4	100.0	100.0
BUG Rating	**B5-U3-G1**		

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2023-09-11	Test Ambient:	25.2 º C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-FL21-300WBH6SA1-abcdWfR57		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230901	120.0	60	2.538	303.94	0.998	4.17
0E-BB 2	277.0	60	1.114	295.99	0.959	6.95
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

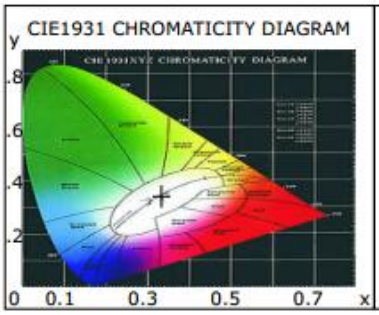
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5483
Duv	0.0027
Chromaticity (x, y)	x=0.3329 y=0.3467
Chromaticity (u', v')	u(u')=0.2050 v'=0.4804
Color Rendering Index (CRI)	82
R9	-2
Rf	82
Rg	94
Rcs,h1(%)	-14

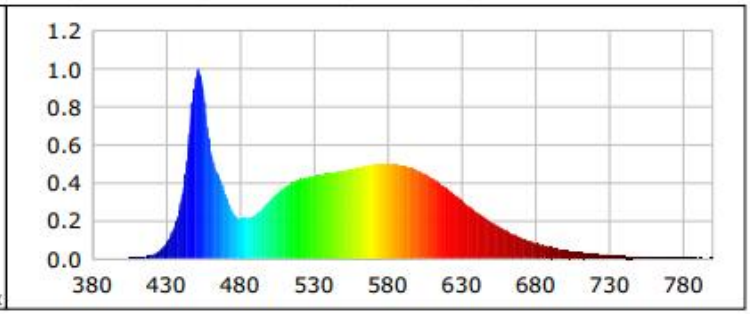
Special Color Rendering Indices			
R1	80	R9	-2
R2	88	R10	71
R3	93	R11	80
R4	81	R12	57
R5	81	R13	82
R6	83	R14	96
R7	86	R15	74
R8	64	--	--
--	--	--	--
--	--	--	--

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)	45439.0	44161.7	>=10000(-10%)
Luminous Efficacy (lm/W)	149.50	149.20	Premium: >= 120(-3%)
Most worst Luminous/Highest Watts	145.30		

Spectral Power Distribution & Chromaticity Diagram



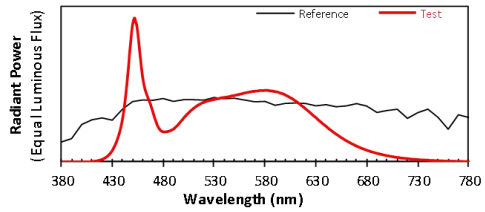


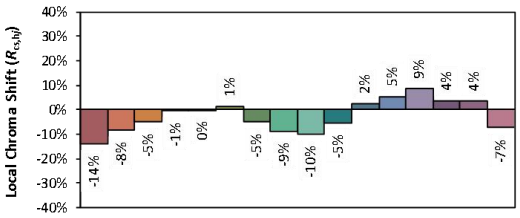
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0005	0.6604	535	0.4251	552.3157	690	0.1104	143.4173
385	0.0005	0.5888	540	0.4334	563.1298	695	0.0953	123.7847
390	0.0003	0.3899	545	0.4406	572.4281	700	0.0816	105.9728
395	0.0002	0.2515	550	0.4489	583.2410	705	0.0701	91.0753
400	0.0008	1.0038	555	0.4538	589.6340	710	0.0602	78.1771
405	0.0016	2.1143	560	0.4623	600.6116	715	0.0519	67.4777
410	0.0034	4.4234	565	0.4700	610.6903	720	0.0432	56.1565
415	0.0081	10.5247	570	0.4791	622.4676	725	0.0369	48.0052
420	0.0182	23.7104	575	0.4867	632.3095	730	0.0310	40.3267
425	0.0383	49.7019	580	0.4914	638.5245	735	0.0266	34.5993
430	0.0787	102.2149	585	0.4970	645.7046	740	0.0231	30.0314
435	0.1563	203.0576	590	0.4979	646.8702	745	0.0191	24.7826
440	0.2960	384.5690	595	0.4939	641.7233	750	0.0170	22.0441
445	0.5919	769.0853	600	0.4891	635.5455	755	0.0146	18.9519
450	0.9544	1239.9798	605	0.4794	622.8797	760	0.0118	15.3830
455	0.8992	1168.2661	610	0.4651	604.2785	765	0.0105	13.5883
460	0.5821	756.2826	615	0.4463	579.8962	770	0.0086	11.1679
465	0.4468	580.4619	620	0.4250	552.2621	775	0.0071	9.2139
470	0.3450	448.2901	625	0.3972	516.0330	780	0.0052	6.7498
475	0.2441	317.1308	630	0.3690	479.4922	785	0.0060	7.7363
480	0.2084	270.8355	635	0.3389	440.3681	790	0.0049	6.4047
485	0.2129	276.5731	640	0.3085	400.8868	795	0.0030	3.9083
490	0.2272	295.1355	645	0.2766	359.3456	800	0.0033	4.2644
495	0.2611	339.2314	650	0.2485	322.9106			
500	0.3042	395.2890	655	0.2194	285.0336			
505	0.3414	443.5983	660	0.1927	250.4082			
510	0.3731	484.7589	665	0.1692	219.8090			
515	0.3987	518.0721	670	0.1479	192.1208			
520	0.4135	537.2439	675	0.1277	165.8684			
525	0.4251	552.3157	680	0.1104	143.4173			
530	0.4334	563.1298	685	0.0953	123.7847			

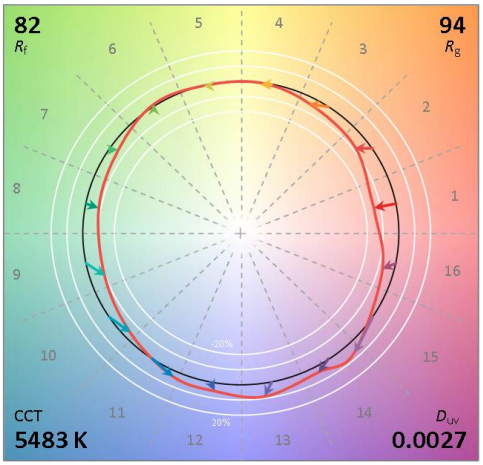
TM30

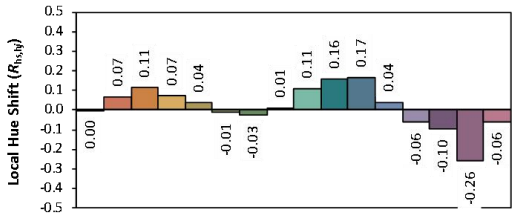
ANSI/IES TM-30-18 Color Rendition Report

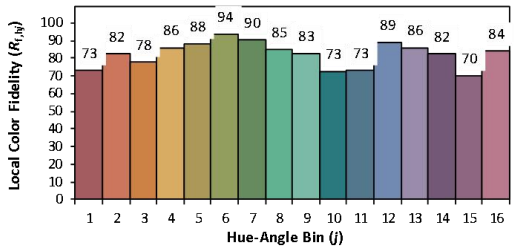
Source:	L128-5780RC35003P1	Manufacturer:	ASMART LIGHT CO., LTD
Date:	2023/9/11	Model:	AST-FL21-300WBH6SA1-abcdWfR57

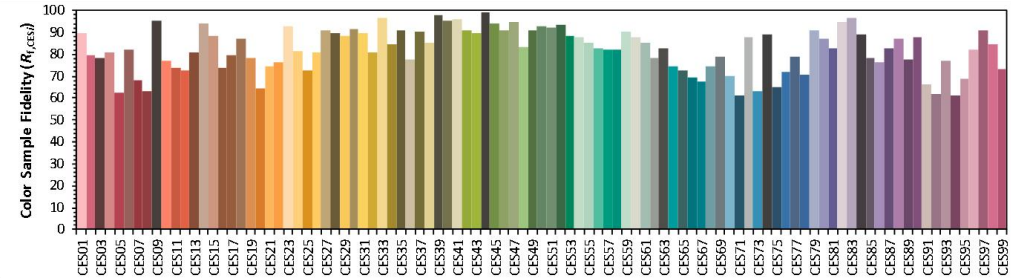












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3329
y	0.3467
u'	0.2050
v'	0.4804

CIE 13.3-1995 (CRI)

R_a	82
R_9	-2

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

Calculated Efficacy Data for family models:

Model Number	Luminous Flux (lm)	Power (W)	Efficacy (lm/W)
AST-FL21-300WBH6SA1-abcdWfR30	42957.3	302.91	141.82
AST-FL21-300WBH6SA1-abcdWfR35	44198.2	303.43	145.66
AST-FL21-300WBH6SA1-abcdWfR40	45439.0	303.94	149.50
AST-FL21-300WBH6SA1-abcdWfR45	45439.0	303.94	149.50
AST-FL21-300WBH6SA1-abcdWfR50	45439.0	303.94	149.50
AST-FL21-300WBH6SA1-abcdWfR57	45439.0	303.94	149.50

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

44198.2 = (45439 + 42957.3) / 2

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

303.425 = (303.94 + 302.91) / 2

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

145.66 = 44198.15 / 303.43

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometeric System	GPM-3000	DYHXF120001	2023-01-17
AC Power Source	CHP-500C	DYBWD010159	2023-01-18
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2023-02-01
Digital Power Meter	WT500	DYDWQ20010	2023-01-18
Integral Sphere (2M)	2M	DYJCE120067	2023-01-17
Digital Power Meter	WT500	DYDWQ200006	2023-01-18
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2023-01-17
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 ********