



Report No.: BLC1806021E-I

LM-79-08 Test Report

For

Beyond LED Technology

(Brand Name: Beyond LED)

1939 Parker Ct Suite C, Stone Mountain, GA 30087

Titan Series Linear High Bay

Model name(s): BLT-PHB03-300WSAA1

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

Test & Report By:

Grace Li

Engineer: Grace Li

Date: June 27, 2018

Review By:

Tommy Liang

Manager: Tommy Liang



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1.1 Product Information:

Organization Name	Beyond LED Technology	
Brand Name	Beyond LED	
Model Number	BLT-PHB03-300WSAA1	
SKU (if available)	150893	
Type of Luminaire (for integral lamps, list base type and lamp type)	High Bay Luminaires for Commercial and Industrial Buildings	
Rated Voltage / Frequency	100-277Vac, 50/60 Hz	
Nominal Power	300W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K,5700K	
LED Manufacturer	Hongli Zhihui Group Co.,Ltd.	
LED Model	HL-AS-PU2835DW-S1-08-PCT-HR3	
Sample Number	BLC1806021E-I1(4000K),I2(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	June 20, 2018
Date of Test	June 25, 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	2018-06-25	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-PHB03-300WSAA1		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180602	120.0	60	2.493	293.80	0.9822	5.16
1E-II	277.0	60	1.094	283.79	0.9361	10.16
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

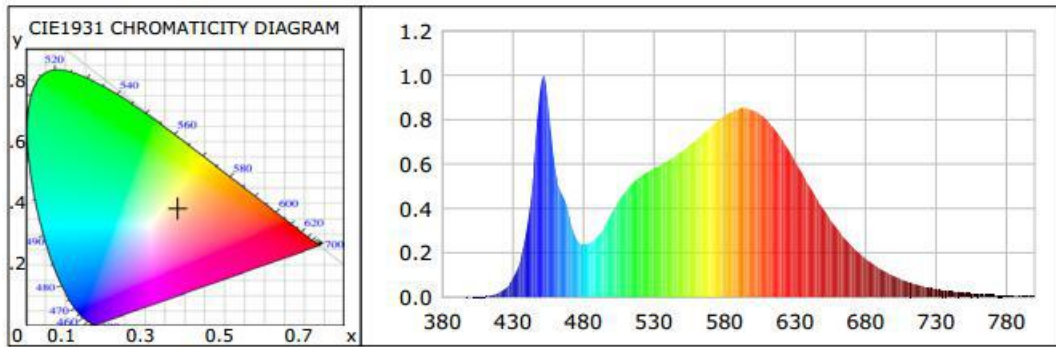
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	0
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	3958	R3	95	R11	79
Duv	0.00039	R4	80	R12	59
Chromaticity (x, y)	x=0.3826 y=0.3789	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2257 v'(v')=0.5029	R6	85	R14	98
Color Rendering Index (CRI)	81.7	R7	84	R15	73
R9	0	R8	61	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	39636.8	39748.5	>=10000(-10%)
Luminous Efficacy (lm/W)	134.91	140.06	Premium: >= 130(-3%)
Most worst Luminous/Highest Watts	134.91		
Zonal lumens in the 20-50° zone (%)	52.6	--	>=30(-10)
Beam Angle (°)	113.5	--	--
Center Beam Candle Power (cd)	14223	--	--



Spectral Power Distribution & Chromaticity Diagram



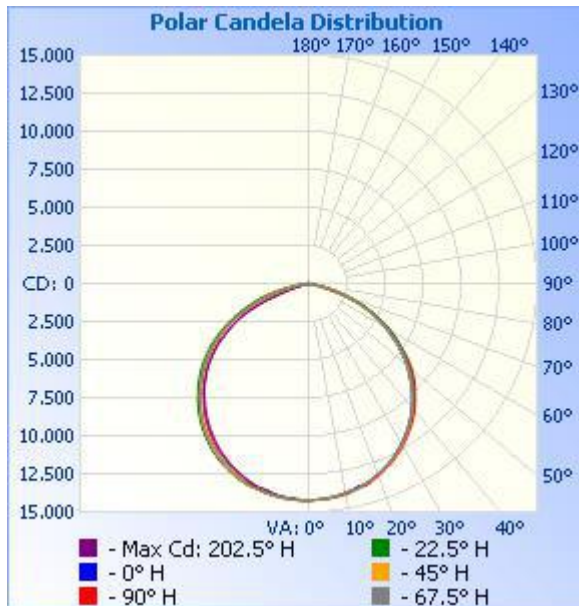
Zonal Lumen Tabulation

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Luminaire
0-30	11,195.3	28.2%	28.2%
0-40	18,468.2	46.6%	46.6%
0-60	32,868.5	82.9%	82.9%
60-90	6,608.9	16.7%	16.7%
70-100	1,906.7	4.8%	4.8%
90-120	72.9	0.2%	0.2%
0-90	39,477.4	99.6%	99.6%
90-180	154.9	0.4%	0.4%
0-180	39,632.3	100%	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	1,347.6	3.4%	90-100	28.6	0.1%
10-20	3,889.4	9.8%	100-110	22.8	0.1%
20-30	5,958.3	15.0%	110-120	21.5	0.1%
30-40	7,272.9	18.4%	120-130	20.0	0.1%
40-50	7,605.0	19.2%	130-140	19.2	0%
50-60	6,795.2	17.1%	140-150	17.3	0%
60-70	4,730.9	11.9%	150-160	13.8	0%
70-80	1,676.1	4.2%	160-170	8.7	0%
80-90	201.9	0.5%	170-180	3.0	0%

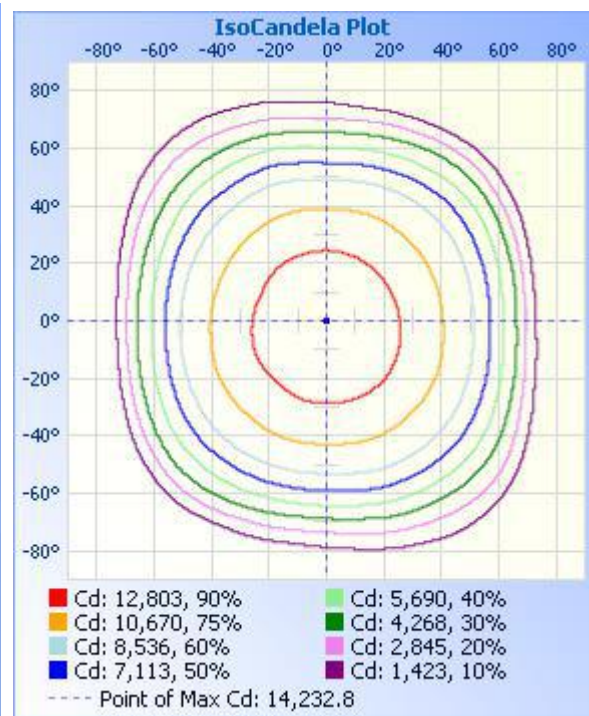
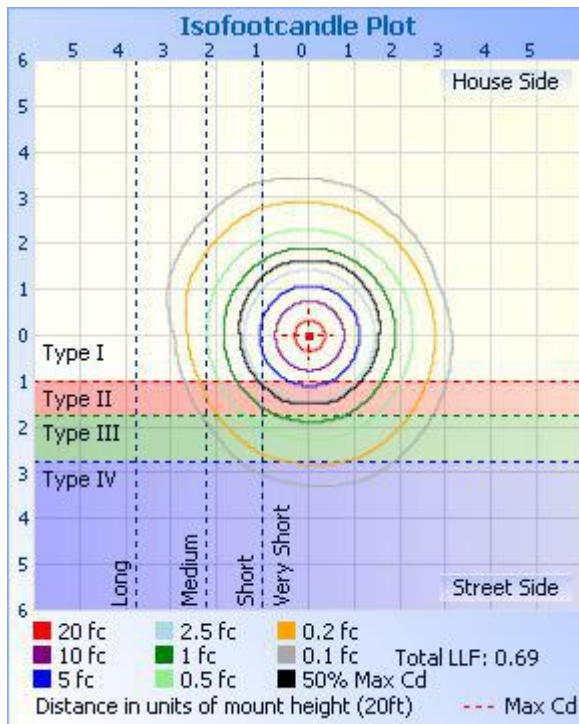


Photometric Data



	Center Beam fc	Beam Width	
17.0ft	49.2 fc	52.4 ft	51.6 ft
34.0ft	12.3 fc	104.9 ft	103.1 ft
51.0ft	5.5 fc	157.3 ft	154.7 ft
68.0ft	3.1 fc	209.8 ft	206.2 ft
85.0ft	2.0 fc	262.2 ft	257.8 ft
102.0ft	1.4 fc	314.7 ft	309.4 ft

■ Vert. Spread: 114.1°
■ Horiz. Spread: 113.2°





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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	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223	14223
1	14213	14209	14208	14212	14223	14228	14225	14226	14227	14232	14231	14231	14216	14209	14212	14213	14213
2	14199	14191	14196	14194	14219	14229	14225	14223	14225	14233	14232	14228	14206	14194	14194	14197	14199
3	14185	14179	14175	14176	14205	14229	14215	14216	14216	14228	14232	14221	14191	14175	14175	14174	14185
4	14166	14158	14158	14155	14189	14224	14207	14204	14204	14218	14221	14207	14179	14156	14155	14152	14166
5	14144	14138	14136	14133	14177	14215	14200	14194	14192	14210	14207	14193	14159	14139	14131	14126	14144
6	14115	14109	14111	14102	14158	14197	14184	14187	14173	14194	14185	14175	14139	14120	14106	14096	14115
7	14079	14078	14073	14071	14137	14180	14166	14175	14152	14178	14162	14157	14112	14093	14071	14064	14079
8	14038	14032	14029	14038	14110	14159	14141	14154	14129	14152	14141	14134	14080	14054	14036	14026	14038
9	14000	13987	13984	13999	14081	14132	14116	14133	14102	14117	14114	14103	14038	14002	13992	13984	14000
10	13954	13926	13927	13942	14041	14103	14083	14111	14071	14080	14077	14067	13988	13939	13938	13924	13954
11	13901	13876	13880	13885	13993	14061	14042	14081	14038	14049	14039	14028	13927	13854	13868	13877	13901
12	13845	13856	13880	13881	13939	14018	13992	14042	13997	14012	13983	13967	13863	13808	13813	13857	13845
13	13769	13856	13873	13881	13873	13971	13940	13992	13955	13955	13930	13900	13776	13808	13767	13841	13769
14	13696	13798	13796	13831	13825	13905	13875	13943	13905	13905	13882	13883	13776	13761	13767	13762	13696
15	13696	13710	13724	13735	13778	13817	13816	13906	13848	13858	13882	13875	13728	13675	13670	13671	13696
16	13648	13633	13653	13654	13778	13810	13769	13858	13771	13858	13883	13792	13653	13597	13582	13589	13648
17	13577	13560	13581	13577	13686	13764	13769	13850	13698	13811	13801	13708	13571	13520	13501	13502	13577
18	13494	13487	13506	13487	13589	13693	13674	13767	13698	13736	13720	13625	13484	13431	13416	13428	13494
19	13410	13401	13420	13403	13508	13608	13571	13680	13663	13648	13647	13537	13398	13336	13324	13341	13410
20	13314	13305	13329	13307	13424	13513	13482	13596	13606	13579	13572	13462	13305	13238	13227	13251	13314
21	13221	13215	13248	13215	13329	13423	13393	13524	13512	13503	13492	13365	13212	13148	13128	13147	13221
22	13123	13141	13146	13130	13235	13328	13300	13421	13425	13422	13401	13278	13125	13056	13016	13071	13123
23	13026	13031	13054	13020	13136	13248	13193	13326	13332	13335	13309	13183	13032	12959	12920	12961	13026
24	12910	12931	12948	12909	13042	13165	13098	13229	13240	13245	13216	13091	12928	12851	12802	12866	12910
25	12802	12820	12837	12795	12940	13072	12997	13138	13160	13144	13116	12973	12825	12723	12692	12760	12802
26	12677	12707	12735	12680	12834	12964	12896	13033	13059	13031	13007	12867	12710	12608	12571	12639	12677
27	12563	12558	12618	12564	12710	12860	12792	12935	12955	12953	12890	12764	12599	12490	12444	12515	12563
28	12423	12455	12497	12426	12592	12746	12675	12819	12851	12832	12782	12658	12488	12383	12325	12389	12423
29	12291	12330	12370	12313	12469	12620	12561	12713	12730	12732	12667	12535	12369	12247	12185	12293	12291

Laboratory: Shenzhen Belling Test Laboratory A2LA Certificate# 4810.01
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30	12144	12197	12227	12171	12337	12489	12438	12597	12621	12608	12545	12421	12232	12112	12039	12156	12144
31	12002	12074	12094	12032	12202	12354	12319	12468	12482	12483	12421	12298	12106	11968	11901	12016	12002
32	11863	11925	11952	11887	12055	12222	12186	12346	12350	12354	12288	12169	11963	11837	11764	11887	11863
33	11711	11779	11799	11749	11905	12079	12038	12215	12209	12227	12146	12036	11823	11690	11606	11735	11711
34	11561	11648	11630	11587	11761	11930	11896	12093	12071	12094	12002	11896	11672	11543	11457	11586	11561
35	11405	11485	11476	11434	11620	11782	11755	11953	11927	11962	11866	11768	11518	11387	11320	11434	11405
36	11238	11333	11297	11279	11477	11614	11613	11797	11782	11799	11723	11610	11365	11232	11167	11288	11238
37	11075	11170	11122	11114	11311	11468	11451	11653	11621	11669	11553	11462	11204	11075	11013	11121	11075
38	10914	10999	10947	10948	11158	11308	11292	11486	11456	11517	11392	11308	11041	10911	10869	10954	10914
39	10719	10839	10774	10769	10997	11140	11133	11322	11289	11351	11226	11146	10865	10753	10699	10774	10719
40	10551	10652	10571	10583	10825	10973	10963	11147	11113	11186	11048	10971	10698	10569	10521	10603	10551
41	10347	10476	10389	10403	10654	10799	10791	10972	10931	11012	10860	10799	10507	10383	10349	10412	10347
42	10151	10309	10191	10225	10452	10602	10601	10770	10731	10845	10669	10602	10323	10205	10155	10211	10151
43	9965	10116	9998	10041	10266	10441	10394	10592	10549	10668	10499	10425	10134	10044	9962	10019	9965
44	9742	9917	9795	9862	10081	10245	10209	10406	10348	10488	10310	10220	9951	9852	9784	9824	9742
45	9529	9734	9580	9665	9901	10035	10017	10210	10158	10286	10122	10028	9772	9679	9575	9619	9529
46	9310	9533	9358	9450	9707	9834	9829	9998	9960	10105	9923	9832	9555	9497	9380	9412	9310
47	9081	9328	9152	9236	9511	9628	9638	9803	9732	9921	9718	9633	9355	9289	9194	9197	9081
48	8867	9139	8937	9008	9300	9420	9411	9589	9527	9735	9521	9429	9132	9094	8989	8975	8867
49	8651	8913	8721	8802	9092	9213	9207	9381	9335	9518	9315	9210	8921	8887	8773	8750	8651
50	8417	8697	8470	8574	8870	8959	8991	9159	9128	9322	9111	8996	8715	8658	8541	8531	8417
51	8189	8474	8229	8329	8639	8744	8764	8913	8922	9124	8901	8778	8500	8445	8312	8285	8189
52	7934	8243	7990	8100	8382	8506	8528	8689	8693	8908	8672	8559	8245	8202	8080	8048	7934
53	7670	8000	7746	7859	8132	8195	8299	8445	8484	8683	8457	8334	8008	7956	7842	7791	7670
54	7439	7761	7503	7609	7853	7887	8074	8225	8271	8433	8227	8085	7768	7714	7588	7539	7439
55	7189	7537	7238	7359	7539	7633	7814	7959	8033	8213	8005	7859	7527	7469	7345	7290	7189
56	6915	7284	6994	7115	7213	7400	7470	7717	7810	7987	7744	7622	7289	7204	7082	7054	6915
57	6654	7032	6746	6827	6954	7158	7176	7452	7570	7744	7504	7376	7016	6903	6825	6760	6654
58	6384	6772	6488	6546	6707	6917	6925	7186	7310	7506	7263	7099	6765	6562	6574	6496	6384
59	6119	6517	6221	6256	6455	6660	6674	6911	7039	7249	6998	6833	6397	6290	6258	6194	6119
60	5853	6254	5986	5940	6198	6305	6422	6608	6779	6964	6727	6575	6088	6022	5896	5918	5853
61	5619	6000	5714	5602	5869	5998	6147	6336	6493	6708	6428	6313	5797	5787	5627	5649	5619

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62	5352	5695	5447	5306	5535	5743	5851	6067	6223	6419	6163	6023	5539	5465	5342	5391	5352
63	5102	5426	5160	5027	5241	5481	5505	5738	5931	6142	5866	5742	5240	5124	5098	5122	5102
64	4826	5132	4860	4748	4980	5183	5220	5371	5659	5858	5575	5463	4887	4819	4789	4835	4826
65	4521	4840	4535	4461	4707	4821	4937	5061	5360	5568	5268	5175	4558	4407	4411	4554	4521
66	4241	4543	4260	4109	4376	4522	4638	4782	5038	5288	4943	4855	4264	3931	4142	4215	4241
67	3966	4247	3996	3811	4056	4251	4321	4507	4729	5014	4642	4503	3822	3507	3756	3911	3966
68	3664	3968	3681	3527	3795	3747	4008	4190	4396	4719	4325	4190	3317	3092	3246	3602	3664
69	3360	3691	3426	3247	3423	3253	3728	3850	4119	4419	4069	3899	2950	2402	2878	3296	3360
70	3082	3406	3128	2914	2884	2890	3259	3542	3795	4141	3757	3614	2349	1993	2369	2966	3082
71	2812	3093	2846	2624	2519	2368	2780	3249	3503	3854	3453	3261	1857	1703	1841	2656	2812
72	2536	2826	2543	2317	2076	1807	2437	2979	3200	3558	3177	2934	1574	1276	1557	2344	2536
73	2258	2566	2226	1917	1567	1524	1915	2644	2911	3273	2878	2538	1242	825	1241	1943	2258
74	2033	2308	1984	1578	1284	1081	1464	2373	2632	2987	2614	2122	796	677	789	1644	2033
75	1752	2041	1733	1151	840	703	1209	2044	2354	2708	2336	1778	610	374	603	1152	1752
76	1525	1765	1459	872	581	573	729	1679	2097	2426	2085	1304	355	307	368	916	1525
77	1275	1507	1241	557	439	362	554	1348	1775	2116	1804	1011	283	282	285	631	1275
78	1069	1274	1046	393	303	324	391	928	1541	1855	1536	700	252	252	251	423	1069
79	870	1050	836	262	263	289	302	720	1319	1589	1310	463	220	228	228	266	870
80	663	850	615	231	225	261	281	420	1108	1332	1084	284	195	199	205	192	663
81	486	652	395	202	217	232	246	290	893	1099	822	215	174	185	174	165	486
82	294	481	254	174	184	206	228	215	705	878	573	191	159	157	155	146	294
83	178	358	148	147	149	183	185	188	527	681	367	165	132	132	134	127	178
84	112	242	117	126	136	158	165	163	345	512	211	147	121	109	120	112	112
85	93	160	92	117	117	136	142	140	211	374	126	125	90	97	105	96	93
86	78	109	83	98	94	114	127	115	128	267	106	108	81	82	94	83	78
87	61	62	46	84	71	91	108	103	100	174	82	93	60	65	68	60	61
88	43	60	54	69	66	80	69	80	87	113	59	81	48	47	48	43	43
89	33	47	36	47	42	60	80	73	74	70	61	65	27	29	37	30	33
90	31	42	37	38	30	42	38	50	59	49	41	50	21	23	34	27	31
91	31	38	30	37	0	22	29	39	44	40	36	32	21	21	39	24	31
92	31	36	27	30	14	23	33	36	44	35	30	27	20	28	26	28	31
93	32	40	27	37	16	20	29	36	37	39	31	24	21	18	30	21	32

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94	36	33	27	31	0	21	28	22	38	36	24	27	13	20	28	19	36
95	31	22	31	39	0	20	28	28	29	37	26	32	12	19	25	18	31
96	30	24	28	37	0	17	31	28	38	35	26	30	15	17	27	21	30
97	25	31	23	18	0	18	33	30	34	27	24	27	16	18	27	24	25
98	34	24	20	31	0	15	27	26	36	30	17	27	14	13	30	20	34
99	29	28	23	19	0	18	29	18	31	29	28	28	12	20	31	26	29
100	23	26	22	31	0	14	24	22	31	32	19	25	12	16	21	19	23
101	28	27	27	33	0	17	28	28	32	34	21	30	0	14	27	25	28
102	33	21	26	27	0	13	23	20	36	25	26	26	11	18	27	22	33
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124	24	27	27	27	0	19	29	17	28	26	23	27	11	15	26	20	24
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Laboratory: Shenzhen Belling Test Laboratory A2LA Certificate# 4810.01
Building No3 3rd floor, room 303, No 2-10 south Jinlong avenue, Sand Lake community, Biling street, Pingshan district, Shenzhen, Guangdong,CN. Website: <http://www.blst.com>

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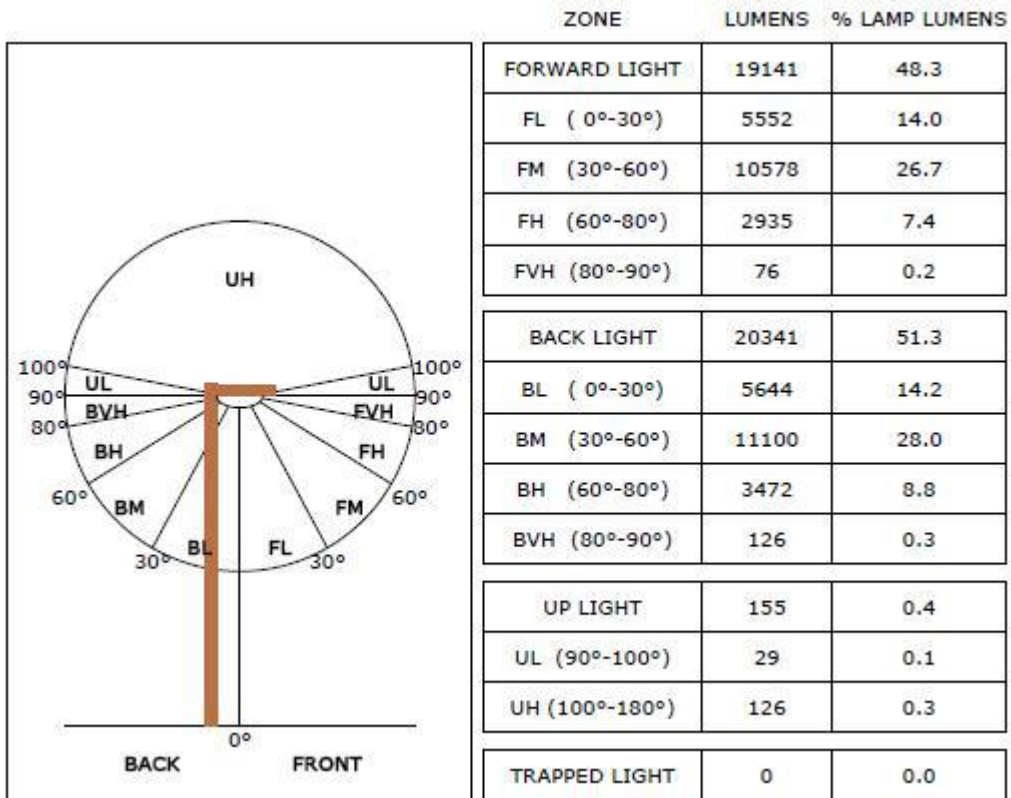
Laboratory: Shenzhen Belling Test Laboratory A2LA Certificate# 4810.01
Building No3 3rd floor, room 303, No 2-10 south Jinlong avenue, Sand Lake community, Biling street, Pingshan district, Shenzhen, Guangdong,CN. Website: <http://www.blst.com>

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158	35	31	26	39	0	23	36	34	41	32	29	42	22	23	30	31	35
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177	38	38	34	33	0	27	33	31	36	39	33	25	26	22	43	28	38
178	35	28	30	40	11	24	30	33	31	35	31	37	18	35	40	28	35
179	36	30	31	37	11	19	39	33	42	35	29	38	25	28	37	27	36
180	29	28	24	42	0	24	34	39	30	34	20	29	19	27	37	36	29



**2.2 Electrical, Photometric and Chromaticity Measurements***(Refer to Work Instruction BL-QP-033)*

Test date	2018-06-25	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-PHB03-300WSAA1		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180602	120.0	60	2.506	295.14	0.9816	5.39
1E-I2	277.0	60	1.105	286.03	0.9349	10.51
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	4
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	5652	R3	92	R11	81
Duv	0.00013	R4	82	R12	58
Chromaticity (x, y)	x=0.3291 y=0.3383	R5	82	R13	84
Chromaticity (u', v')	u(u')=0.2056 v'(v')=0.4756	R6	83	R14	96
Color Rendering Index (CRI)	82.9	R7	86	R15	77
R9	4	R8	67	--	--

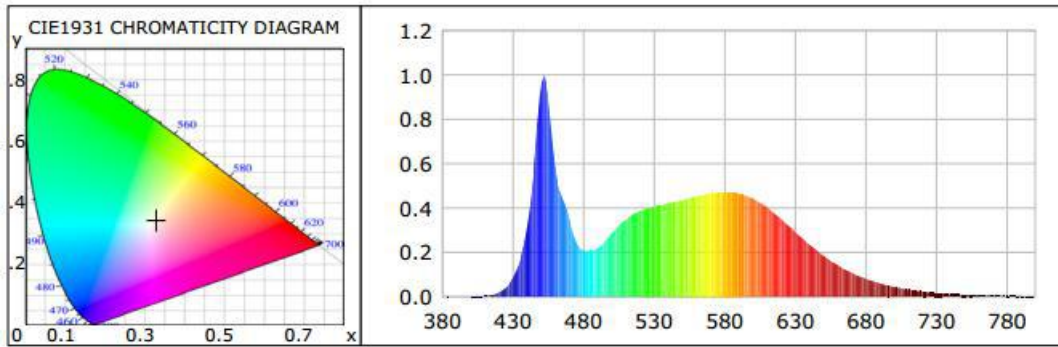
Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.3 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	40918.2	41151.1	>=10000(-10%)
Luminous Efficacy (lm/W)	138.64	143.87	Premium: >= 130(-3%)
Most worst Luminous/Highest Watts	138.64		



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Spectral Power Distribution & Chromaticity Diagram





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Calculated Efficacy Data for family models (5000K):

Model Number	Luminous Flux (lm)	Power (W)	Efficacy (lm/W)
BLT-PHB03-300WSAA1	39636.8	293.80	134.91
BLT-PHB03-300WSAA1	40460.2	294.47	137.40
BLT-PHB03-300WSAA1	40918.2	295.14	138.64



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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 *****