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-PHB03-165WRAC1

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

Test & Report By:

Grace li

Engineer: Grace Li

Date: June 27, 2018

Update:July 17, 2018

Review By:

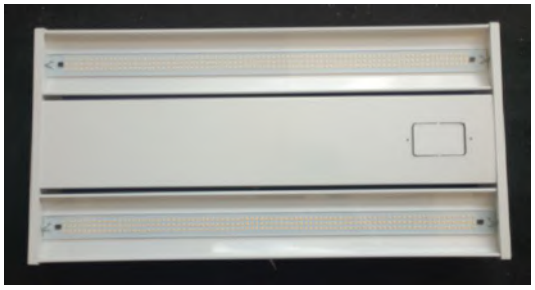
Tommy Liang

Manager: Tommy Liang

1.1 Product Information:

Organization Name	Beyond LED Technology	
Brand Name	Beyond LED	
Model Number	BLT-PHB03-165WRAC1	
SKU (if available)	150891	
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	165W	
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-E1(4000K),E2(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	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.
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.
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	2018-06-25	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-PHB03-165WRAC1		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180602 1E-E1	120.0	60	1.373	164.02	0.9957	6.98
	277.0	60	0.5906	159.03	0.9721	8.41
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

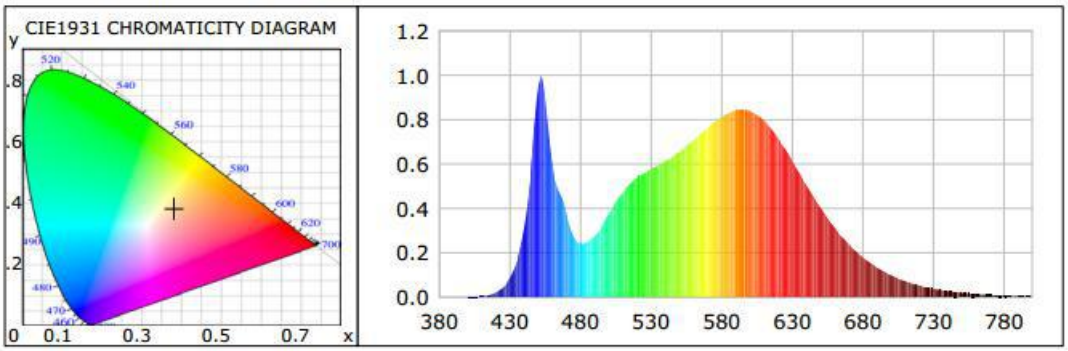
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3966
Duv	0.00004
Chromaticity (x, y)	x=0.3820 y=0.3778
Chromaticity (u', v')	u(u')=0.2257 v'=0.5023
Color Rendering Index (CRI)	82.0
R9	2

Special Color Rendering Indices			
R1	80	R9	2
R2	89	R10	75
R3	95	R11	79
R4	80	R12	60
R5	80	R13	83
R6	85	R14	98
R7	84	R15	74
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)	22493.2	22141.5	>=10000(-10%)
Luminous Efficacy (lm/W)	137.14	139.23	Premium: >= 130(-3%)
Most worst Luminous/Highest Watts	134.99		
Zonal lumens in the 20-50° zone (%)	53.0	--	>=30(-10)
Beam Angle (°)	113.2	--	--
Center Beam Candle Power (cd)	8124	--	--

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary

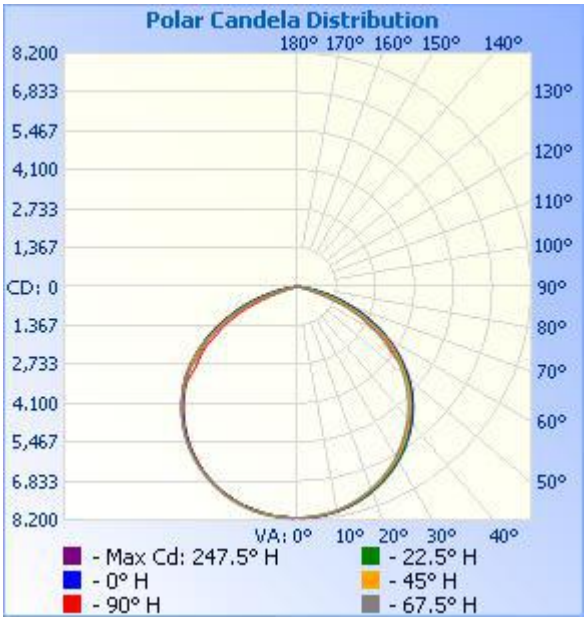
Zone	Lumens	% Lamp	% Luminaire
0-30	6,387.9	28.4%	28.4%
0-40	10,539.0	46.9%	46.9%
0-60	18,754.0	83.4%	83.4%
60-90	3,605.2	16%	16%
70-100	1,031.9	4.6%	4.6%
90-120	62.0	0.3%	0.3%
0-90	22,359.2	99.4%	99.4%
90-180	131.4	0.6%	0.6%
0-180	22,490.6	100%	100%

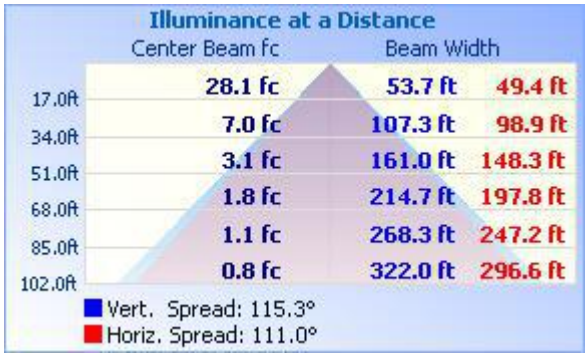
Lumens Per Zone

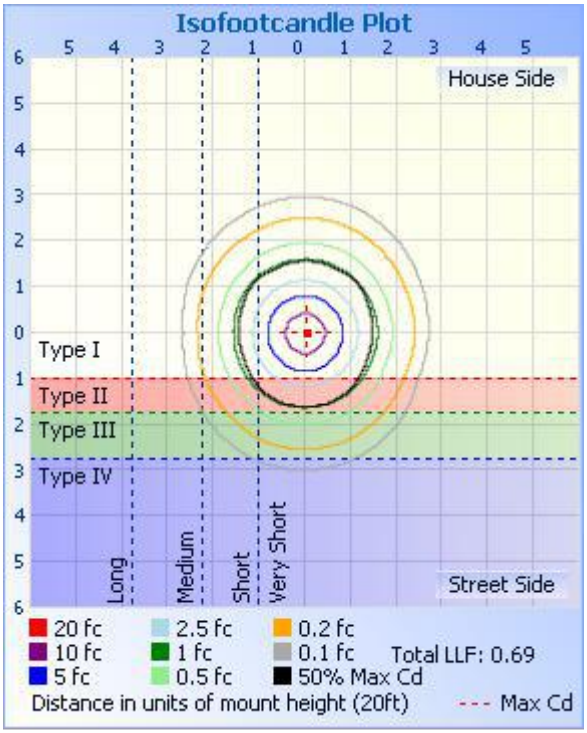
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	770.1	3.4%	90-100	23.4	0.1%
10-20	2,219.4	9.9%	100-110	19.8	0.1%
20-30	3,398.4	15.1%	110-120	18.8	0.1%
30-40	4,151.1	18.5%	120-130	17.3	0.1%
40-50	4,358.4	19.4%	130-140	15.7	0.1%
50-60	3,856.5	17.1%	140-150	14.9	0.1%
60-70	2,596.7	11.5%	150-160	11.6	0.1%
70-80	897.6	4.0%	160-170	7.3	0%
80-90	110.9	0.5%	170-180	2.5	0%

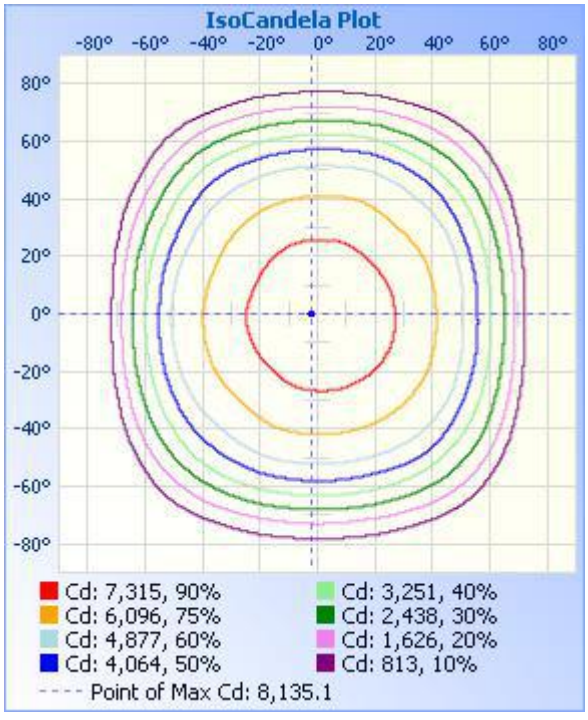
Certificate#4810.01

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	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124	8124
1	8126	8123	8114	8118	8132	8118	8116	8120	8125	8125	8123	8131	8119	8124	8121	8132	8126
2	8121	8121	8108	8113	8131	8112	8112	8116	8121	8119	8120	8135	8117	8127	8117	8128	8121
3	8114	8111	8101	8106	8126	8103	8103	8108	8114	8112	8121	8132	8111	8122	8112	8119	8114
4	8105	8099	8090	8092	8128	8094	8088	8101	8107	8109	8114	8128	8102	8115	8100	8109	8105
5	8096	8087	8075	8080	8112	8076	8075	8092	8100	8102	8106	8128	8098	8105	8093	8103	8096
6	8083	8079	8062	8059	8103	8063	8062	8080	8094	8093	8094	8114	8091	8092	8086	8088	8083
7	8068	8063	8045	8041	8080	8047	8040	8068	8082	8079	8087	8100	8079	8085	8070	8082	8068
8	8050	8043	8028	8026	8062	8031	8029	8051	8062	8059	8074	8087	8059	8067	8052	8059	8050
9	8030	8029	8007	8001	8042	8011	8004	8022	8039	8045	8055	8075	8036	8047	8032	8041	8030
10	8004	8003	7982	7971	8026	7986	7975	7999	8012	8020	8039	8055	8007	8031	8015	8020	8004
11	7973	7979	7955	7943	8001	7965	7952	7972	7986	7996	8018	8036	7982	8001	7991	7997	7973
12	7949	7949	7921	7913	7977	7933	7922	7949	7964	7976	7997	8008	7958	7973	7959	7964	7949
13	7917	7921	7892	7878	7947	7897	7890	7920	7939	7947	7965	7985	7941	7947	7932	7936	7917
14	7890	7893	7853	7836	7911	7859	7856	7887	7912	7916	7928	7959	7917	7922	7891	7912	7890
15	7855	7859	7813	7793	7862	7825	7821	7855	7877	7886	7896	7921	7889	7883	7856	7877	7855
16	7823	7827	7776	7754	7809	7780	7781	7815	7840	7849	7864	7887	7851	7841	7816	7841	7823
17	7788	7787	7728	7705	7763	7734	7738	7775	7804	7811	7825	7854	7820	7798	7776	7797	7788
18	7746	7741	7685	7659	7723	7683	7690	7730	7753	7773	7793	7814	7781	7761	7731	7758	7746
19	7705	7708	7635	7611	7668	7635	7639	7691	7712	7731	7747	7767	7743	7717	7684	7720	7705
20	7654	7661	7591	7553	7619	7589	7587	7643	7672	7690	7701	7719	7703	7674	7632	7679	7654
21	7603	7610	7532	7494	7574	7537	7529	7598	7622	7640	7649	7671	7659	7617	7579	7628	7603
22	7559	7563	7477	7439	7521	7485	7475	7545	7567	7592	7600	7614	7612	7563	7519	7579	7559
23	7510	7508	7426	7381	7464	7430	7415	7486	7518	7543	7552	7566	7554	7512	7455	7528	7510
24	7451	7452	7365	7327	7407	7368	7352	7438	7461	7476	7496	7513	7489	7455	7396	7473	7451
25	7392	7391	7306	7260	7335	7316	7288	7376	7397	7423	7432	7454	7430	7389	7325	7417	7392
26	7332	7325	7239	7192	7265	7257	7220	7320	7337	7363	7374	7394	7370	7328	7272	7357	7332
27	7274	7261	7174	7127	7189	7190	7147	7257	7280	7301	7308	7332	7298	7265	7199	7289	7274
28	7216	7201	7108	7057	7117	7126	7077	7201	7219	7236	7245	7265	7213	7197	7121	7229	7216
29	7146	7122	7042	6982	7036	7046	7002	7133	7155	7171	7179	7201	7136	7131	7061	7164	7146

30	7081	7060	6970	6904	6956	6981	6915	7066	7076	7101	7103	7128	7062	7056	6983	7099	7081
31	7010	6987	6897	6818	6866	6900	6849	6992	7010	7027	7038	7059	6982	6978	6909	7034	7010
32	6930	6907	6817	6739	6783	6825	6761	6916	6925	6951	6965	6977	6911	6905	6830	6949	6930
33	6855	6823	6724	6661	6704	6754	6679	6843	6853	6878	6896	6907	6830	6824	6743	6872	6855
34	6772	6742	6649	6569	6624	6669	6605	6762	6777	6802	6813	6821	6740	6740	6654	6796	6772
35	6687	6664	6564	6477	6539	6587	6510	6689	6677	6715	6722	6733	6658	6655	6571	6716	6687
36	6605	6574	6484	6395	6448	6500	6426	6594	6592	6633	6644	6655	6580	6570	6479	6634	6605
37	6522	6483	6386	6300	6378	6416	6333	6508	6504	6540	6556	6569	6481	6487	6388	6544	6522
38	6430	6381	6299	6207	6282	6322	6235	6417	6409	6449	6465	6479	6382	6395	6300	6455	6430
39	6340	6283	6206	6115	6199	6227	6143	6328	6324	6358	6372	6387	6295	6295	6196	6368	6340
40	6244	6194	6110	6017	6120	6135	6038	6239	6226	6254	6273	6289	6187	6199	6095	6270	6244
41	6147	6083	6014	5913	6044	6033	5926	6138	6121	6161	6173	6185	6083	6096	5996	6176	6147
42	6053	5984	5907	5804	5960	5930	5826	6031	6026	6059	6061	6083	5995	5988	5891	6082	6053
43	5944	5878	5807	5700	5867	5817	5711	5937	5933	5951	5961	5979	5884	5877	5788	5979	5944
44	5843	5767	5703	5587	5769	5711	5599	5836	5815	5843	5846	5861	5789	5768	5689	5876	5843
45	5729	5654	5589	5470	5663	5595	5493	5727	5703	5734	5742	5759	5681	5663	5580	5779	5729
46	5609	5544	5474	5360	5562	5485	5384	5594	5594	5619	5630	5643	5549	5538	5459	5656	5609
47	5508	5426	5362	5238	5448	5367	5262	5482	5478	5501	5516	5533	5427	5421	5349	5544	5508
48	5385	5306	5235	5114	5337	5235	5132	5366	5369	5384	5393	5412	5305	5308	5230	5427	5385
49	5268	5184	5112	4994	5200	5114	5014	5242	5245	5249	5270	5288	5188	5177	5112	5320	5268
50	5141	5061	4988	4874	5079	4991	4889	5104	5115	5125	5141	5160	4972	5058	5003	5200	5141
51	5020	4927	4851	4740	4947	4861	4770	4975	4996	4995	5017	5032	4743	4933	4866	5078	5020
52	4880	4801	4723	4599	4808	4719	4647	4843	4862	4864	4889	4899	4532	4771	4742	4942	4880
53	4731	4660	4578	4467	4628	4590	4516	4710	4726	4726	4751	4692	4384	4550	4613	4810	4731
54	4587	4519	4444	4258	4355	4450	4376	4581	4588	4569	4604	4440	4262	4322	4476	4674	4587
55	4454	4375	4321	4021	4147	4301	4241	4424	4455	4423	4475	4248	4120	4142	4344	4525	4454
56	4324	4220	4165	3839	4005	4048	4111	4278	4324	4283	4335	4113	3984	4008	4212	4370	4324
57	4168	4086	4023	3682	3872	3835	3976	4127	4187	4125	4192	3965	3851	3869	4060	4222	4168
58	4024	3932	3875	3526	3732	3655	3826	3975	4027	3967	4048	3820	3625	3722	3905	4063	4024
59	3862	3779	3703	3372	3589	3507	3678	3828	3868	3814	3883	3686	3388	3579	3758	3910	3862
60	3696	3621	3564	3217	3338	3362	3531	3648	3719	3668	3638	3514	3222	3396	3598	3746	3696
61	3540	3466	3334	2958	3108	3200	3391	3487	3562	3501	3420	3263	3090	3151	3358	3589	3540

62	3396	3281	3095	2757	2948	2991	3219	3314	3382	3330	3227	3035	2941	2964	3116	3410	3396
63	3231	3119	2924	2614	2812	2752	3005	3168	3233	3154	3073	2903	2757	2803	2951	3253	3231
64	3054	2950	2756	2468	2661	2601	2771	2995	3075	2989	2921	2756	2497	2653	2789	3085	3054
65	2874	2786	2602	2277	2402	2452	2611	2824	2909	2816	2761	2608	2330	2494	2640	2924	2874
66	2739	2604	2441	2061	2237	2305	2453	2660	2739	2650	2584	2393	2173	2266	2490	2721	2739
67	2573	2433	2206	1919	2085	2052	2276	2483	2570	2470	2351	2190	1933	2080	2280	2551	2573
68	2407	2275	2003	1696	1803	1903	2106	2298	2408	2299	2162	2044	1717	1946	2042	2371	2407
69	2232	2097	1843	1420	1523	1724	1876	2128	2245	2148	2000	1820	1498	1693	1888	2198	2232
70	2075	1918	1684	1143	1260	1431	1730	1968	2090	1982	1845	1592	1219	1486	1735	2021	2075
71	1892	1755	1467	1015	1112	1163	1564	1792	1929	1795	1631	1396	970	1268	1583	1855	1892
72	1733	1595	1315	798	855	995	1373	1628	1748	1610	1448	1139	765	1017	1360	1682	1733
73	1580	1406	1115	580	620	814	1212	1457	1592	1412	1287	875	545	803	1238	1519	1580
74	1434	1216	863	479	506	578	1037	1309	1439	1251	1067	687	345	615	1043	1328	1434
75	1253	1064	703	270	297	461	810	1154	1275	1117	886	509	218	393	869	1123	1253
76	1106	935	531	198	198	288	631	970	1134	967	670	306	184	242	677	972	1106
77	961	758	365	185	179	190	502	816	968	809	491	204	170	180	500	828	961
78	813	634	259	159	163	178	334	679	834	677	360	184	151	163	367	692	813
79	685	505	162	147	150	153	230	553	709	561	211	163	125	144	217	567	685
80	562	394	148	122	129	137	148	440	584	450	156	140	117	126	145	467	562
81	443	267	133	118	117	123	132	338	473	327	130	133	107	117	124	350	443
82	343	188	117	109	102	111	125	236	358	232	123	115	86	104	109	256	343
83	250	124	104	94	82	92	104	159	267	146	112	100	69	83	100	165	250
84	186	82	89	74	65	67	90	107	190	92	95	96	64	74	85	113	186
85	125	67	82	75	56	71	85	74	125	76	81	69	48	51	81	69	125
86	85	65	74	56	46	55	60	63	88	75	66	67	25	48	65	54	85
87	53	57	63	52	39	45	58	53	64	52	69	51	33	41	60	42	53
88	46	44	37	37	26	39	51	47	53	40	43	43	0	30	48	44	46
89	33	42	38	28	24	33	39	30	38	33	39	37	12	26	37	35	33
90	30	34	33	28	0	20	26	31	29	36	35	23	0	22	26	26	30
91	28	25	30	22	14	20	34	29	25	27	35	23	0	20	32	27	28
92	26	29	33	16	0	15	31	27	24	26	29	20	0	21	29	19	26
93	24	31	36	20	0	0	29	25	27	34	29	20	0	21	31	20	24

94	25	33	36	23	0	16	33	20	27	26	26	15	0	18	31	19	25
95	26	27	25	18	0	16	33	29	24	28	33	20	0	15	28	21	26
96	23	25	33	26	0	15	28	24	30	29	27	16	0	18	26	24	23
97	24	26	35	23	0	18	27	26	30	22	26	14	0	17	26	22	24
98	25	30	30	24	0	12	31	20	24	27	30	20	0	0	25	22	25
99	24	27	33	22	0	0	27	17	25	31	27	18	0	13	33	25	24
100	17	28	23	23	0	0	29	20	23	31	20	16	0	0	25	22	17
101	30	27	28	15	0	0	27	21	25	24	28	19	0	13	26	23	30
102	15	20	32	22	0	15	26	17	26	20	27	17	0	18	24	17	15
103	16	26	27	18	0	14	25	16	21	29	21	17	0	16	29	17	16
104	18	30	32	21	0	12	29	19	22	25	27	21	0	17	22	21	18
105	27	28	25	22	0	0	31	23	24	19	28	25	0	12	22	17	27
106	22	26	30	19	0	13	24	19	25	30	31	14	0	0	25	19	22
107	15	22	26	21	0	0	32	19	14	24	32	24	0	20	24	21	15
108	20	22	30	20	0	14	21	16	21	33	25	18	0	15	18	17	20
109	24	21	30	17	0	15	26	21	25	30	34	22	0	13	28	18	24
110	22	27	23	18	0	0	31	18	13	21	29	19	0	16	29	16	22
111	19	25	28	25	0	12	25	19	23	29	26	18	0	12	28	13	19
112	24	29	25	23	0	12	28	22	18	25	32	19	0	20	22	20	24
113	19	26	33	15	0	14	27	20	24	21	27	22	0	12	26	16	19
114	15	27	33	19	0	0	31	18	27	29	34	16	0	13	26	20	15
115	24	27	26	16	0	12	29	19	20	27	25	22	0	0	26	15	24
116	22	21	28	19	0	0	25	22	25	26	29	16	0	15	23	23	22
117	21	24	26	18	0	17	28	22	15	30	28	23	0	16	28	24	21
118	22	24	28	12	0	15	32	17	23	26	30	21	0	11	24	20	22
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124	24	27	25	24	0	13	25	21	26	22	26	22	0	19	28	15	24
125	24	28	29	17	0	11	29	17	23	21	30	23	0	15	24	21	24

126	24	28	30	23	0	15	28	26	24	24	28	20	0	15	26	21	24
127	23	27	25	21	0	15	25	21	26	24	28	21	0	0	26	14	23
128	23	22	30	14	0	0	25	19	24	27	24	17	0	15	24	21	23
129	21	19	31	15	0	13	25	27	24	23	27	19	0	20	28	22	21
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134	28	33	24	17	0	13	28	18	24	30	27	21	0	13	26	21	28
135	19	22	28	19	0	20	29	24	20	25	31	18	0	19	30	11	19
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146	33	29	32	24	0	21	33	26	27	27	35	23	0	17	33	30	33
147	30	36	32	25	0	13	33	29	20	26	35	23	11	20	27	29	30
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156	28	37	26	30	0	15	35	24	24	37	32	28	13	23	39	24	28
157	31	20	37	21	0	17	29	24	17	35	36	27	11	25	31	29	31

158	21	36	36	19	0	21	29	28	26	40	32	25	14	22	37	27	21
159	32	31	38	29	0	16	29	27	31	30	33	25	0	23	30	25	32
160	23	39	41	17	0	18	35	26	31	37	32	29	11	23	35	28	23
161	28	37	38	24	0	15	32	26	30	39	32	31	0	20	31	27	28
162	25	34	42	28	0	21	35	26	29	40	37	23	14	25	30	24	25
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164	24	36	30	26	0	19	31	29	34	31	33	30	13	18	39	19	24
165	33	25	40	24	0	21	35	26	31	33	35	25	15	22	30	26	33
166	27	35	37	27	0	15	35	31	27	26	31	27	0	19	37	31	27
167	21	32	35	30	0	15	38	27	26	40	38	30	0	16	35	21	21
168	30	31	40	23	0	0	28	21	33	36	29	23	0	25	36	27	30
169	31	26	38	25	0	22	37	24	32	37	35	26	16	23	40	27	31
170	28	42	33	26	0	25	33	29	32	28	35	28	0	26	37	31	28
171	32	40	41	26	0	16	27	31	31	33	28	21	15	27	34	26	32
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179	24	37	36	30	0	15	32	21	25	35	33	27	16	24	36	31	24
180	29	33	36	23	0	16	33	24	28	34	28	30	11	23	38	33	29

Certificate#4810.01

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2018-06-25	Test Ambient:	25.2 º C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-PHB03-165WRAC1		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC180602 1E-E2	120.0	60	1.381	164.91	0.9948	7.05
	277.0	60	0.5962	160.37	0.9710	8.83
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

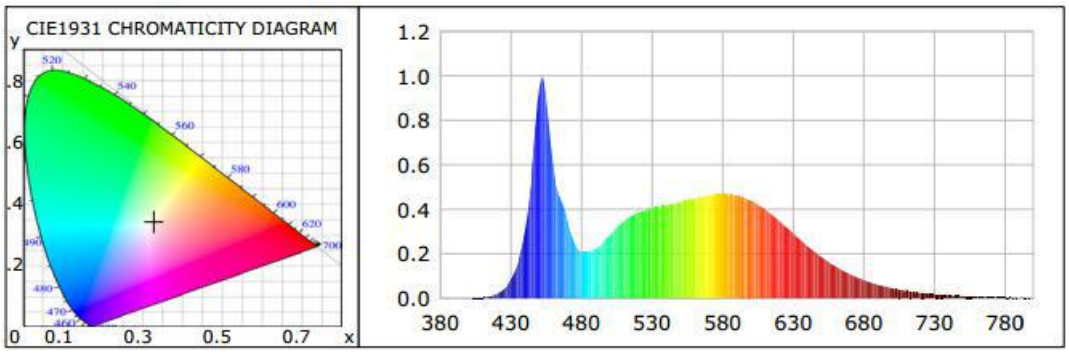
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5672
Duv	0.00005
Chromaticity (x, y)	x=0.3286 y=0.3378
Chromaticity (u', v')	u(u')=0.2055 v'=0.4753
Color Rendering Index (CRI)	83.1
R9	5

Special Color Rendering Indices			
R1	82	R9	5
R2	89	R10	73
R3	92	R11	81
R4	82	R12	58
R5	82	R13	84
R6	84	R14	96
R7	86	R15	77
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)	23216.0	22838.3	>=10000(-10%)
Luminous Efficacy (lm/W)	140.78	142.41	Premium: >= 130(-3%)
Most worst Luminous/Highest Watts	138.49		

Spectral Power Distribution & Chromaticity Diagram



Calculated Efficacy Data for family models (5000K):

Model Number	Luminous Flux (lm)	Power (W)	Efficacy (lm/W)
BLT-PHB03-165WRAC1	22493.2	164.02	137.14
BLT-PHB03-165WRAC1	22581.7	164.47	137.30
BLT-PHB03-165WRAC1	23216.0	164.91	140.78

3. Test Equipment

Equipment Name	Model No.	Serial No.	Next Calibration Date
Goniophotometeric 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 ********