LM-79-08 Test Report

For

ELEC-TECH INTERNATIONAL CO LTD

No.1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong Province, P.R. China 519085

LED High Bay Light

Model name(s):
502321XX

Representative (Tested) Model:
50232161

Model Difference: XX=61-70 intends CCT is 5000K.

Prepare By:

Engineer: Leo Liu
Date: 2017-06-12

Review By:

Technical Lead: Vincent Yuan
Date: 2017-06-12

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Product Information:

Client Name:	ELEC-TECH INTERNATIONAL CO LTD
Brand Name:	Commercial Electric
Model Number:	502321XX (XX=61-70)
Product type:	High Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	AC120-277V, 50/ 60Hz, 171W
Declared CCT:	5000K
Declared Light output:	18000lm
LED Manufacturer:	Samsung
LED Model:	SPMWH1228
LED Quantity:	792 pcs
Forward current of LED Chip:	120mA
Date of Receipt Samples:	2017-06-01
Quantity of Receipt Samples:	1
Sample Number:	170601001-S1

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_ntc@163.com

Report Information

Issued Date of Test Report:	2017-06-12
Revised Date of Test Report:	N/A
Test Report No.:	NTCR17060013
Remark (*If applicable*)	N/A

Test Specifications:	
Date of Test	2017-06-01
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. THD and PF
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry

Test Methods

1. Photometric and Electrical measurements – Light Distribution 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 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° Vertical intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric 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 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

3. THD and PF measurements

The sample was tested according to the ANSI C82.77-2002, the sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

Integrating Sphere Test Results

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.0	35	Face Down	90	25

Electrical Data:

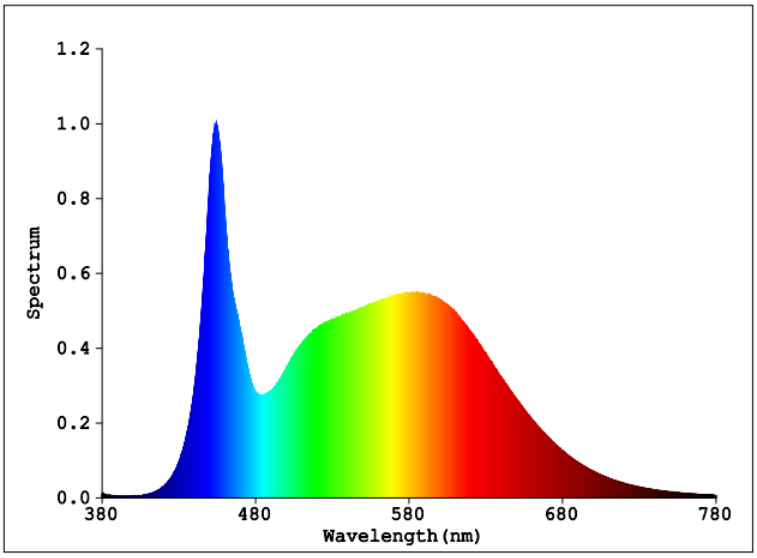
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	1.4035	167.5	0.9944

Color Data:

Parameter	Result
CCT (K)	5252
Color Rendering Index (CRI)	85.5
R9	18
Chromaticity, x	0.3385
Chromaticity, y	0.3489
Chromaticity u′	0.2080
Chromaticity v′	0.4824
Duv	0.00133

Special Color Rendering			
R1	84	R9	18
R2	92	R10	80
R3	95	R11	83
R4	84	R12	63
R5	85	R13	87
R6	87	R14	98
R7	87	R15	80
R8	70	-	-

Spectrum Diagram:



Goniophotometer Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.1	36	Face Down	90	25

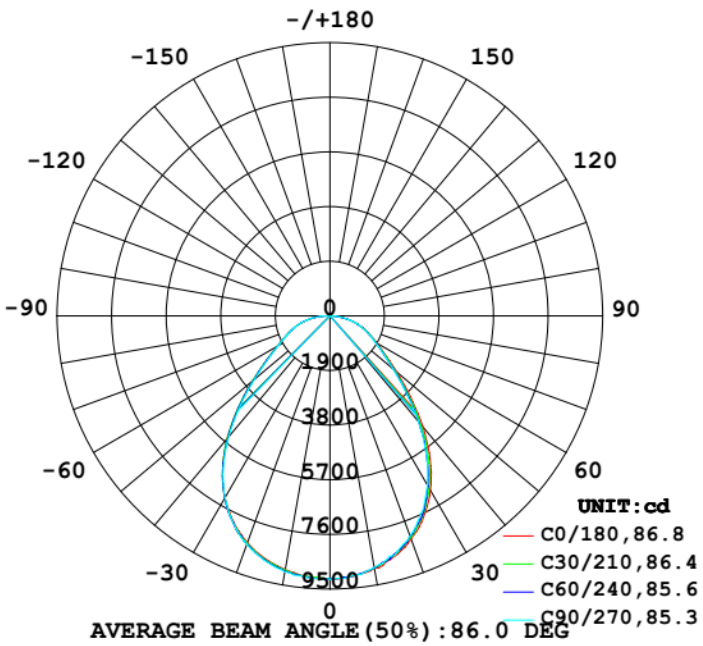
Electrical Data:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	1.403	167.5	0.9944

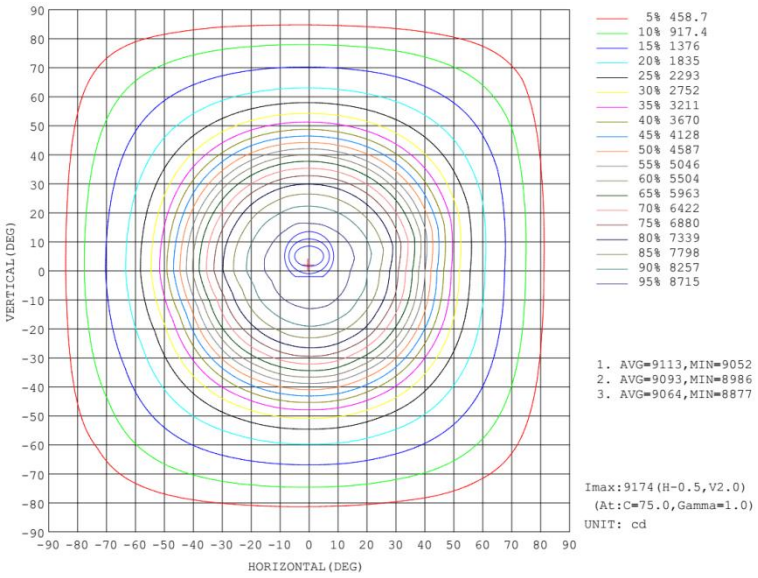
Goniophotometer Data:

Parameter	Result
Total Luminous (lm)	19282
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	115.13
Zonal Lumens Distribution (0-60°)	84.2%
Beam Angle (°)	86.0
Center Beam Candle Power (cd)	9190

Luminous Intensity Distribution Diagram:



Isocandela Diagram:



Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	8914	8900	8892	8887	8957	9000	9033	9026	0- 10	863.9	863.9	4.48,4.48
20	8266	8214	8143	8154	8395	8449	8458	8459	10- 20	2450	3314	17.2,17.2
30	6990	6914	6802	6867	7308	7339	7314	7336	20- 30	3579	6893	35.8,35.8
40	5049	4892	4798	4935	5571	5549	5483	5497	30- 40	3878	10771	55.9,55.9
50	3046	2938	2872	2994	3507	3484	3429	3424	40- 50	3215	13986	72.5,72.5
60	1892	1841	1815	1873	2125	2110	2086	2082	50- 60	2256	16242	84.2,84.2
70	1227	1204	1194	1237	1399	1404	1389	1377	60- 70	1605	17847	92.6,92.6
80	544.5	537.6	550.0	578.4	763.3	788.0	786.9	750.5	70- 80	1048	18896	98,98
90	3.226	3.012	2.794	3.101	32.10	60.24	45.02	10.84	80- 90	334.2	19230	99.7,99.7
100	3.543	3.487	2.729	3.866	3.550	3.367	2.981	3.516	90-100	6.571	19236	99.8,99.8
110	6.080	4.500	3.865	5.506	5.330	3.293	4.505	4.744	100-110	4.182	19241	99.8,99.8
120	9.568	6.214	5.261	8.422	8.937	4.495	5.966	7.517	110-120	5.731	19246	99.8,99.8
130	13.81	8.366	7.609	10.91	14.58	5.704	7.428	10.30	120-130	7.414	19254	99.9,99.9
140	13.18	7.633	10.71	9.424	15.72	7.035	9.203	12.66	130-140	8.339	19262	99.9,99.9
150	13.57	12.70	11.73	13.68	13.44	7.813	11.61	12.41	140-150	7.698	19270	99.9,99.9
160	11.35	16.51	12.66	18.04	15.38	9.378	12.32	14.39	150-160	6.255	19276	100,100
170	13.24	17.78	15.28	22.72	15.08	13.35	14.21	18.90	160-170	4.083	19280	100,100
180	14.88	15.97	15.98	22.15	14.70	16.10	16.11	22.21	170-180	1.553	19282	100,100
DEG	LUMINOUS INTENSITY:cd Less than 25% Percent = 7.3 %									UNIT:lm		

Luminous Distribution Intensity Data:

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	9147	9137	9124	9144	9139	9177	9156	9123	9135	9132	9141	9129	9147	9137	9124	9144	9139	9177	9156
5	9095	9082	9064	9075	9072	9078	9077	9050	9061	9064	9071	9061	9110	9147	9087	9113	9118	9160	9134
10	8914	8940	8904	8900	8900	8897	8892	8882	8881	8887	8886	8893	8957	8984	8973	9000	9016	9040	9033
15	8661	8624	8630	8626	8593	8648	8629	8575	8586	8593	8607	8617	8735	8766	8758	8771	8788	8821	8805
20	8266	8269	8211	8214	8152	8159	8143	8136	8170	8154	8210	8220	8395	8429	8415	8449	8444	8469	8458
25	7725	7709	7648	7667	7633	7587	7546	7544	7567	7609	7643	7674	7925	7959	7952	7976	7950	7989	7957
30	6990	6986	6907	6914	6838	6814	6802	6792	6815	6867	6919	6976	7308	7333	7318	7339	7326	7333	7314
35	6080	6087	5990	5932	5856	5889	5846	5844	5852	5957	6032	6111	6519	6551	6525	6527	6507	6504	6482
40	5049	5013	4934	4892	4805	4831	4798	4813	4828	4935	5013	5100	5571	5587	5563	5549	5527	5519	5483
45	3967	3954	3868	3821	3757	3783	3724	3774	3812	3888	3968	4036	4517	4525	4516	4479	4483	4453	4422
50	3046	3043	2970	2938	2908	2896	2872	2911	2928	2994	3045	3118	3507	3522	3507	3484	3473	3454	3429
55	2358	2347	2294	2286	2261	2263	2249	2269	2286	2333	2374	2421	2703	2716	2700	2686	2677	2665	2645
60	1892	1879	1850	1841	1821	1832	1815	1830	1837	1873	1909	1937	2125	2133	2124	2110	2107	2097	2086
65	1528	1529	1512	1503	1488	1494	1494	1496	1511	1537	1555	1578	1722	1731	1723	1713	1708	1704	1696
70	1227	1222	1202	1204	1189	1200	1194	1206	1216	1237	1250	1272	1399	1407	1405	1404	1401	1397	1389
75	903	898	883	891	879	891	892	902	915	926	940	955	1095	1103	1107	1107	1109	1105	1096
80	544	542	531	538	532	550	550	562	568	578	589	605	763	774	782	788	797	794	787
85	158	156	149	156	155	174	177	186	188	197	203	221	392	403	419	427	447	444	440
90	3.23	3.75	3.23	3.01	3.04	19.7	2.79	42.6	2.98	3.10	3.24	3.19	32.1	39.8	55.8	60.2	68.1	50.6	45.0
95	3.19	3.62	3.37	3.25	3.02	3.18	2.75	2.85	3.01	3.42	3.34	3.49	3.32	3.00	17.9	3.61	21.4	2.86	2.83
100	3.54	4.26	3.50	3.49	2.99	3.49	2.73	3.36	3.07	3.87	3.62	4.06	3.55	2.99	2.92	3.37	2.85	2.86	2.98
105	4.50	5.28	3.80	3.93	3.29	4.00	3.17	4.05	3.67	4.69	4.31	4.96	4.25	3.09	3.30	3.12	3.49	2.92	3.55
110	6.08	6.86	4.94	4.50	3.74	4.64	3.86	4.69	4.30	5.51	5.96	6.60	5.33	4.00	4.06	3.29	4.12	3.68	4.50
115	7.27	6.74	5.89	5.20	4.24	5.21	4.63	5.39	4.99	6.58	7.23	7.10	7.04	5.71	5.01	3.86	4.69	4.19	5.14
120	9.57	9.86	7.25	6.21	5.19	5.78	5.26	6.33	6.19	8.42	9.07	10.5	8.94	7.18	6.34	4.49	5.45	4.95	5.97
125	12.3	11.2	9.43	6.98	6.14	6.80	6.39	7.41	7.78	10.1	9.21	12.6	9.38	7.56	7.00	5.07	6.02	5.72	6.72
130	13.8	12.7	14.0	8.37	7.16	7.75	7.61	9.06	9.73	10.9	10.7	14.5	14.6	10.4	7.07	5.70	6.53	6.29	7.43
135	14.9	13.0	15.5	8.05	8.30	9.47	8.94	10.6	11.4	10.3	13.6	15.0	15.8	11.8	7.68	6.91	7.22	6.98	8.31
140	13.2	12.2	16.0	7.63	9.37	10.7	10.7	11.7	12.8	9.42	15.7	14.7	15.7	12.6	9.83	7.04	8.05	7.75	9.20
145	13.4	13.9	16.5	8.82	9.82	11.0	11.5	12.5	13.0	10.2	15.9	15.4	15.6	13.5	11.8	7.58	9.31	8.76	10.5
150	13.6	13.1	16.0	12.7	10.8	11.4	11.7	12.6	13.1	13.7	15.8	15.1	13.4	14.6	13.1	7.81	9.76	9.21	11.6
155	12.3	12.9	15.0	15.7	12.1	12.4	12.0	12.7	13.3	16.3	16.2	14.8	15.5	14.9	13.3	8.68	11.1	10.8	12.1
160	11.3	11.8	14.9	16.5	12.8	12.9	12.7	12.8	13.5	18.0	16.9	14.4	15.4	15.0	13.5	9.38	11.4	11.4	12.3
165	11.5	11.5	16.2	17.1	13.8	13.7	13.8	14.4	13.7	19.6	19.7	15.2	15.2	15.1	13.6	10.9	12.0	11.7	12.5
170	13.2	12.7	17.5	17.8	15.7	15.6	15.3	16.6	16.6	22.7	21.5	15.0	15.1	14.0	13.8	13.4	13.1	12.4	14.2
175	13.8	13.2	16.5	17.0	16.1	16.0	15.9	16.8	17.7	22.8	21.5	14.5	12.5	12.7	14.2	15.8	14.9	15.1	16.3
180	14.9	14.6	14.6	16.0	15.8	15.9	16.0	16.1	17.7	22.1	19.8	15.2	14.7	14.4	14.4	16.1	15.8	15.9	16.1

Table--2 UNIT: cd

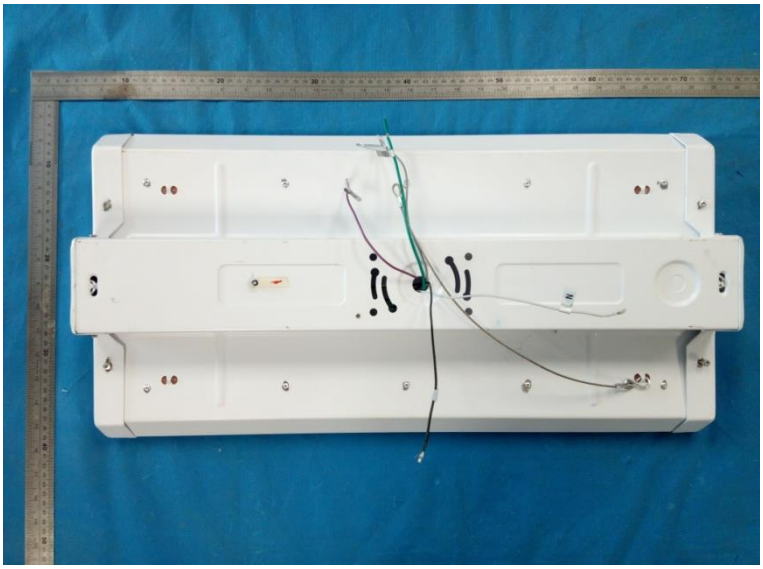
γ (DEG) \ C (DEG)	285	300	315	330	345
0	9123	9135	9132	9141	9129
5	9125	9121	9135	9144	9118
10	9009	9016	9026	9030	9018
15	8796	8787	8799	8838	8786
20	8458	8446	8459	8475	8459
25	7966	7969	7985	8005	7988
30	7316	7317	7336	7358	7346
35	6484	6479	6495	6532	6520
40	5475	5484	5497	5541	5527
45	4406	4412	4417	4458	4433
50	3414	3413	3424	3446	3428
55	2636	2633	2638	2653	2643
60	2077	2076	2082	2089	2082
65	1691	1690	1687	1693	1682
70	1384	1384	1377	1376	1364
75	1090	1087	1076	1070	1053
80	780	767	750	736	712
85	426	410	382	362	336
90	27.4	21.4	10.8	8.01	4.84
95	2.98	3.61	3.29	5.71	3.28
100	2.98	3.80	3.52	3.94	3.45
105	3.18	4.18	3.79	4.70	3.87
110	3.88	5.00	4.74	5.72	4.89
115	4.68	5.95	6.07	7.43	6.72
120	5.69	7.21	7.52	9.02	8.24
125	6.83	8.23	8.86	9.08	8.44
130	7.65	9.05	10.3	9.85	12.1
135	8.29	9.87	12.0	13.7	13.4
140	9.30	11.6	12.7	16.4	13.9
145	11.1	13.0	12.3	17.9	13.6
150	11.8	13.5	12.4	18.3	14.7
155	12.3	15.4	14.0	17.4	15.6
160	13.4	15.5	14.4	17.0	15.8
165	14.1	15.6	14.8	16.4	15.7
170	14.7	16.6	18.9	17.5	14.9
175	16.4	18.7	22.1	19.4	13.4
180	16.4	17.5	22.2	19.7	15.2

THD and PF Measurement Test Result:

Electrical Measurement:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD
277	60	0.6206	161.4	0.9389	19.5

Photo of Sample:



Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2016-12-03	2017-12-02
NTC-F01-006	2.0 meter Integrating Sphere	2016-12-03	2017-12-02
NTC-F01-013	Standard Lamp	2016-12-27	2017-12-26
NTC-F01-031	Digital Power Meter	2016-12-05	2017-12-04
NTC-F01-019	Temperature & Humidity Meter	2016-11-28	2017-11-27

*******END OF DATASHEET*******

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