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):
502283##

Representative (Tested) Model:
50228361

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

Prepare By:

Engineer: Leo Liu
Date: 2017-07-31

Review By:

Technical Lead: Vincent Yuan
Date: 2017-07-31

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:	ETI
Model Number:	502283## (##=61-70)
Product type:	High-bay Luminaires for Commercial and Industrial Buildings
Rating Input:	AC120-277V, 50/ 60Hz, 185W
Declared CCT:	5000K
Declared Light output:	24000 lm
LED Manufacturer:	Samsung
LED Model:	SPMWH1228
LED Quantity:	845 pcs
Forward current of LED	120mA
LED Driver Model:	EWH(D)-200-1.05A
Date of Receipt Samples:	2017-06-30
Quantity of Receipt	1
Sample Number:	170630001-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:	2017-07-31
Revised Date of Test Report:	N/A
Test Report No.:	NTCR17070053
Remark (*If applicable*)	N/A

Test Specifications:	
Date of Test	2017-07-28
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
25.1 ℃	37 %	Face Down	90 min	25 min

Electrical Data:

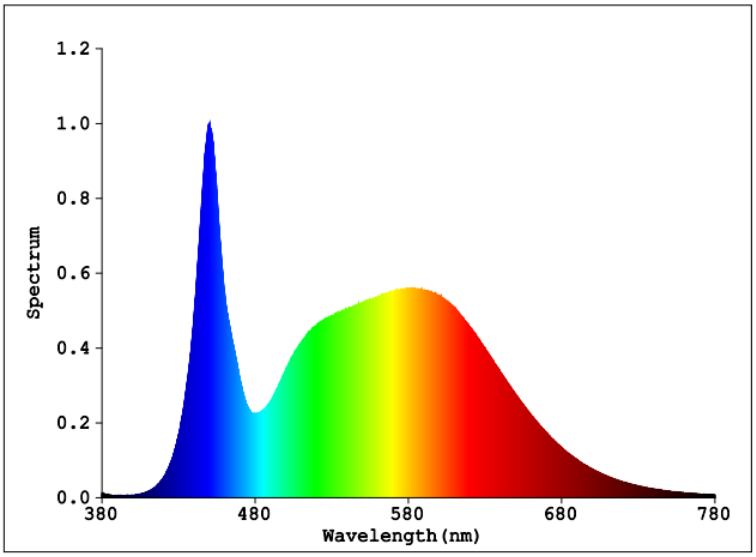
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	1.552	184.8	0.9924

Color Data:

Parameter	Result
CCT (K)	5159
Color Rendering Index (CRI)	84.5
R9	19
Chromaticity, x	0.3406
Chromaticity, y	0.3459
Chromaticity u′	0.2106
Chromaticity v′	0.4812
Duv	-0.00105

Special Color Rendering			
R1	84	R9	19
R2	89	R10	72
R3	91	R11	85
R4	85	R12	65
R5	85	R13	85
R6	84	R14	95
R7	87	R15	80
R8	71	-	-

Spectrum Diagram:



Goniophotometer Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.1 ℃	37 %	Face Down	90 min	25 min

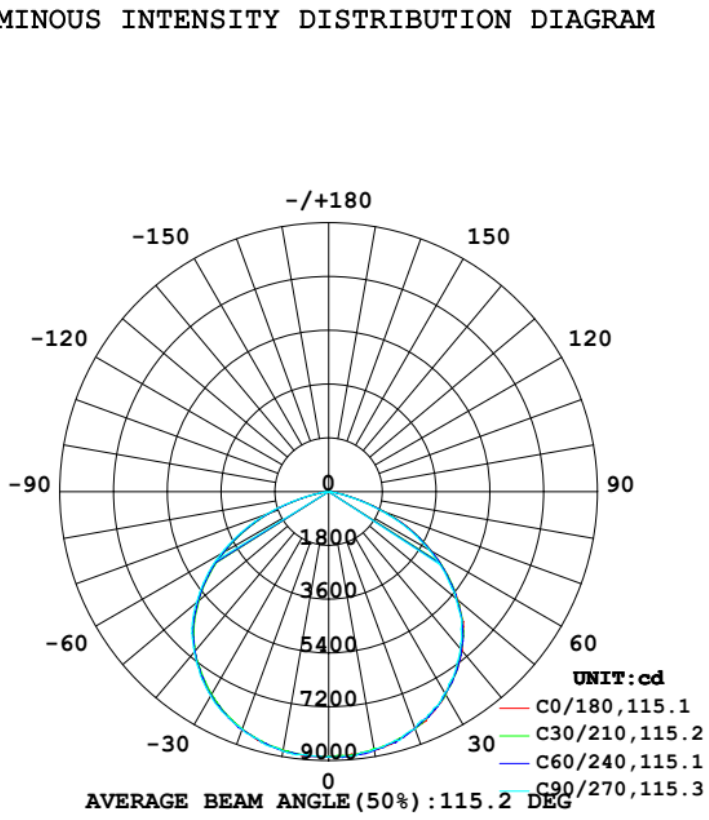
Electrical Data:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	1.552	184.8	0.9924

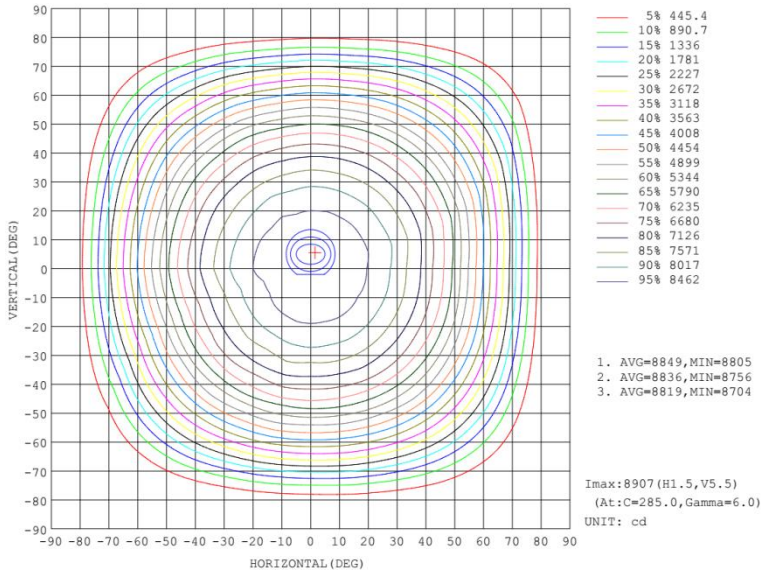
Goniophotometer Data:

Parameter	Result
Total Luminous (lm)	25248
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	136.63
Zonal Lumens Distribution (20-50°)	52.7%
Beam Angle (°)	115.2
Center Beam Candle Power (cd)	8911

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	8797	8787	8763	8765	8781	8810	8818	8790	0- 10	842.2	842.2	3.34,3.34
20	8436	8437	8454	8348	8464	8438	8464	8491	10- 20	2440	3283	13,13
30	7857	7844	7780	7719	7872	7838	7899	7923	20- 30	3767	7049	27.9,27.9
40	6961	6964	6859	6777	6963	6925	7003	7064	30- 40	4640	11689	46.3,46.3
50	5656	5629	5556	5421	5690	5618	5788	5859	40- 50	4895	16584	65.7,65.7
60	3979	3957	3877	3708	4050	3996	4172	4297	50- 60	4344	20928	82.9,82.9
70	2014	2011	1866	1742	2142	2090	2218	2378	60- 70	3020	23948	94.8,94.8
80	290.0	307.7	249.6	194.5	362.9	346.3	412.7	480.7	70- 80	1150	25098	99.4,99.4
90	2.999	2.490	3.143	2.676	4.655	3.587	7.992	12.36	80- 90	97.27	25195	99.8,99.8
100	2.618	3.323	2.935	3.772	3.073	2.423	3.006	2.168	90-100	2.857	25198	99.8,99.8
110	6.443	6.773	6.899	7.350	5.954	5.350	5.638	4.713	100-110	4.689	25203	99.8,99.8
120	8.814	9.442	10.55	11.16	9.470	8.667	9.275	7.907	110-120	7.719	25210	99.9,99.9
130	13.04	11.16	12.91	11.80	10.51	9.569	10.99	8.866	120-130	9.274	25220	99.9,99.9
140	13.87	12.19	14.95	10.53	11.89	9.952	11.76	9.761	130-140	9.093	25229	99.9,99.9
150	14.96	14.48	14.51	13.21	10.80	10.46	12.40	9.759	140-150	7.921	25237	100,100
160	15.54	13.52	13.81	14.42	12.59	11.04	12.78	12.06	150-160	6.150	25243	100,100
170	17.07	14.55	15.40	16.34	15.11	11.55	13.88	14.21	160-170	3.859	25247	100,100
180	17.33	15.44	17.19	17.22	17.39	14.93	17.19	16.65	170-180	1.571	25248	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 11.0 %									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	8846	8872	8865	8839	8883	8840	8867	8868	8830	8860	8805	8852	8846	8872	8865	8839	8883	8840	8867
5	8816	8863	8842	8849	8876	8812	8873	8818	8826	8840	8793	8805	8902	8878	8858	8839	8860	8830	8838
10	8797	8797	8727	8787	8790	8761	8763	8811	8734	8765	8721	8723	8781	8808	8786	8810	8811	8763	8818
15	8651	8670	8633	8631	8693	8625	8611	8595	8595	8584	8606	8572	8673	8655	8643	8628	8676	8646	8685
20	8436	8439	8450	8437	8425	8403	8454	8434	8344	8348	8315	8346	8464	8455	8456	8438	8474	8439	8464
25	8190	8168	8157	8161	8174	8111	8143	8114	8076	8084	8047	8027	8207	8194	8177	8183	8192	8172	8224
30	7857	7837	7843	7844	7806	7778	7780	7766	7719	7719	7646	7643	7872	7850	7829	7838	7874	7848	7899
35	7411	7470	7428	7435	7407	7346	7367	7406	7350	7288	7215	7216	7457	7437	7409	7417	7466	7442	7498
40	6961	6900	6904	6964	6912	6888	6859	6892	6783	6777	6688	6705	6963	6928	6967	6925	6968	6963	7003
45	6385	6408	6356	6355	6337	6304	6295	6311	6197	6184	6140	6142	6405	6356	6375	6363	6421	6410	6474
50	5656	5678	5620	5629	5595	5557	5556	5507	5431	5421	5413	5400	5690	5636	5668	5618	5713	5702	5788
55	4858	4862	4864	4891	4822	4783	4759	4758	4643	4600	4564	4577	4941	4878	4892	4860	4940	4932	5007
60	3979	3997	3949	3957	3932	3901	3877	3851	3783	3708	3655	3648	4050	3980	4023	3996	4063	4056	4172
65	3056	3067	3036	3061	2996	2991	2926	2877	2808	2767	2722	2692	3139	3078	3100	3077	3151	3152	3240
70	2014	2052	2003	2011	1962	1931	1866	1838	1765	1742	1682	1661	2142	2077	2105	2090	2133	2128	2218
75	993	1017	1002	1000	954	935	871	856	788	766	723	716	1111	1063	1098	1076	1120	1110	1189
80	290	314	296	308	285	277	250	232	206	195	174	170	363	342	355	346	369	370	413
85	34.7	42.0	36.2	38.9	33.5	31.7	28.9	27.3	25.6	24.7	22.6	22.1	55.1	47.1	53.6	47.8	54.9	53.5	64.2
90	3.00	2.43	2.94	2.49	3.19	2.74	3.14	2.81	3.19	2.68	3.18	2.35	4.65	3.35	4.26	3.59	5.29	5.28	7.99
95	1.66	1.93	1.85	2.24	2.05	2.30	2.24	2.50	2.23	2.55	2.10	2.30	2.11	2.24	2.23	2.30	2.30	2.29	2.30
100	2.62	3.33	2.55	3.32	2.75	3.45	2.93	3.58	3.06	3.77	3.17	4.15	3.07	2.42	3.00	2.42	2.94	2.29	3.01
105	4.21	4.93	4.27	5.04	4.54	5.24	4.92	5.51	4.91	5.68	4.77	5.80	4.48	3.82	4.41	3.69	4.23	3.56	4.03
110	6.44	6.98	6.18	6.77	6.59	7.54	6.90	7.68	7.02	7.35	7.05	7.71	5.95	5.29	5.87	5.35	5.95	5.22	5.64
115	7.73	8.18	7.01	8.49	8.38	9.69	9.20	9.79	8.74	9.25	8.84	8.85	7.74	6.82	7.47	6.88	7.62	6.94	7.61
120	8.81	9.49	8.68	9.44	9.92	11.0	10.5	11.3	10.0	11.2	9.67	10.6	9.47	8.41	8.68	8.67	9.22	8.59	9.28
125	12.0	11.8	9.37	9.57	11.1	12.2	11.6	12.2	11.3	11.7	9.80	12.5	9.85	9.26	9.89	9.32	10.6	9.75	10.5
130	13.0	12.6	12.1	11.2	11.5	13.2	12.9	13.7	11.9	11.8	11.1	13.6	10.5	10.6	9.82	9.57	10.7	10.5	11.0
135	13.7	13.4	13.4	11.2	11.5	14.1	13.9	14.6	12.8	11.5	13.2	14.0	12.2	11.9	9.38	9.95	10.7	10.5	11.0
140	13.9	13.3	14.8	12.2	11.9	14.1	15.0	14.8	13.5	10.5	15.0	14.4	11.9	11.8	9.44	9.95	11.0	10.6	11.8
145	14.2	15.3	15.5	13.7	11.8	14.1	15.2	15.2	13.5	11.4	15.5	15.4	11.9	11.8	10.8	10.2	11.5	11.0	12.2
150	15.0	15.3	15.9	14.5	11.6	14.6	14.5	15.0	12.4	13.2	15.2	15.4	10.8	12.2	11.8	10.5	11.8	11.4	12.4
155	15.3	15.3	15.2	14.3	13.6	14.6	13.5	14.0	11.6	14.4	14.8	15.3	12.9	13.4	13.9	11.0	12.7	11.5	12.8
160	15.5	15.0	14.8	13.5	15.0	14.1	13.8	13.3	12.2	14.4	14.4	13.9	12.6	12.3	13.1	11.0	13.5	12.7	12.8
165	13.9	13.6	14.7	13.5	17.6	15.6	14.6	14.7	14.2	15.1	14.8	12.6	12.7	11.9	13.1	11.0	13.5	13.2	12.3
170	17.1	17.7	16.4	14.5	19.3	17.3	15.4	16.3	15.9	16.3	15.8	16.9	15.1	14.9	15.2	11.5	16.2	13.6	13.9
175	17.6	17.3	17.3	14.9	20.6	18.7	16.3	17.0	17.0	16.7	16.0	16.7	15.7	15.9	16.6	14.2	18.6	16.8	17.2
180	17.3	17.7	17.4	15.4	20.6	18.9	17.2	17.2	17.1	17.2	15.9	16.5	17.4	17.0	17.1	14.9	20.1	18.2	17.2

Table--2 UNIT: cd

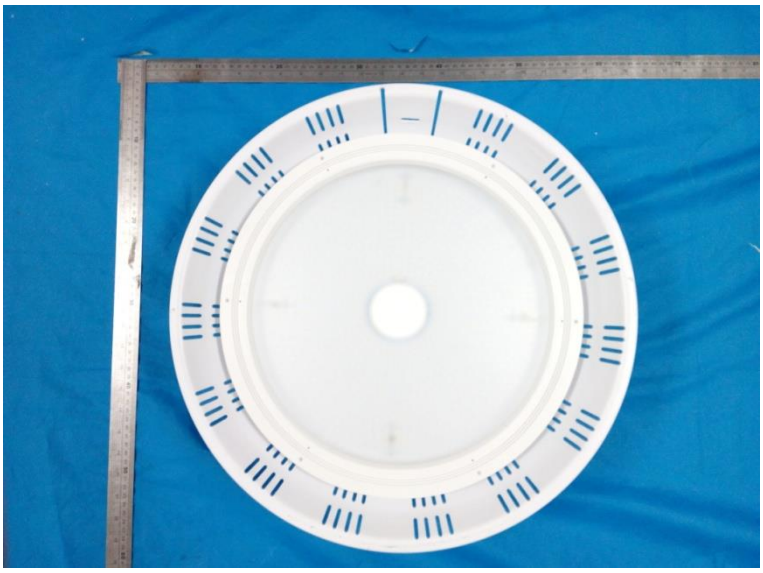
γ (DEG) \ C (DEG)	285	300	315	330	345
0	8868	8830	8860	8805	8852
5	8903	8837	8839	8846	8837
10	8809	8791	8790	8783	8780
15	8661	8661	8686	8690	8664
20	8465	8479	8491	8488	8494
25	8217	8239	8240	8243	8261
30	7916	7904	7923	7934	7944
35	7496	7522	7552	7559	7573
40	7029	7071	7064	7099	7101
45	6494	6511	6518	6563	6563
50	5836	5867	5859	5914	5930
55	5036	5081	5104	5149	5179
60	4184	4275	4297	4322	4341
65	3277	3331	3355	3400	3423
70	2255	2335	2378	2441	2459
75	1199	1293	1334	1393	1416
80	421	462	481	516	527
85	65.7	76.2	80.4	92.7	97.2
90	9.00	11.3	12.4	13.8	14.1
95	2.31	2.17	2.05	1.97	1.85
100	2.37	2.81	2.17	2.61	2.03
105	3.39	4.03	3.19	3.88	3.12
110	4.73	5.37	4.71	5.22	4.58
115	6.52	6.90	6.18	6.75	6.23
120	7.99	8.37	7.91	7.95	7.83
125	9.40	9.95	8.87	9.10	8.79
130	10.3	9.89	8.87	9.36	9.23
135	10.7	9.89	9.44	10.4	9.81
140	10.7	10.3	9.76	10.7	9.81
145	11.4	10.9	9.95	11.7	10.4
150	12.0	10.9	9.76	12.9	11.4
155	12.3	12.0	12.0	12.9	12.4
160	12.3	12.4	12.1	12.7	12.4
165	12.9	12.3	12.1	12.7	12.4
170	13.4	14.4	14.2	14.0	14.7
175	15.9	17.2	15.9	15.9	15.9
180	16.8	17.2	16.7	16.3	16.5

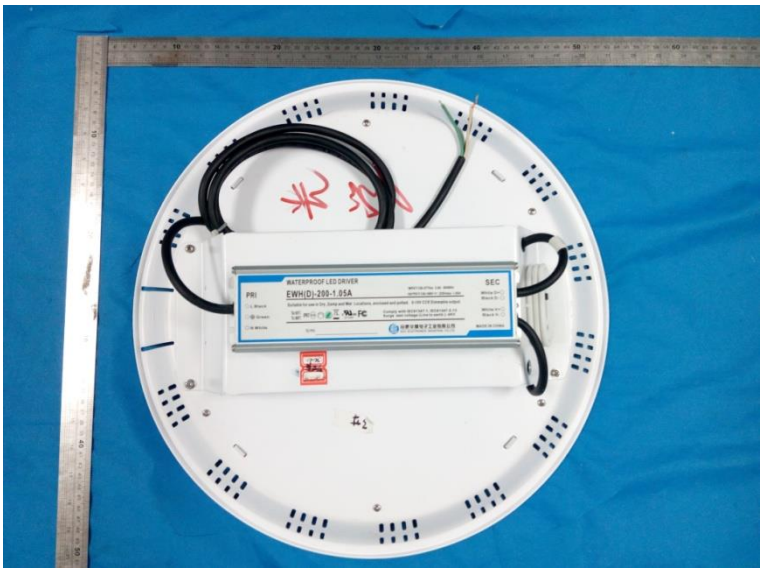
THD and PF Measurement Test Result:

Electrical Measurement:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD
277.0	60	0.7260	184.2	0.9160	10.10

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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