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):
502282XX

Representative (Tested) Model:
50228261

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

Prepare By:

Engineer: Leo Liu
Date: 2017-06-06

Review By:

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

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:	502282XX (XX=61-70)
Product type:	High Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	AC120-277V, 50/ 60Hz, 115W
Declared CCT:	5000K
Declared Light output:	15000 lm
LED Manufacturer:	Samsung
LED Model:	SPMWH1228
LED Quantity:	672 pcs
Forward current of LED Chip:	120mA
Date of Receipt Samples:	2017-06-01
Quantity of Receipt Samples:	1
Sample Number:	170601002-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:	2017-06-06
Revised Date of Test Report:	N/A
Test Report No.:	NTCR17060015
Remark (*If applicable*)	N/A

Test Specifications:	
Date of Test	2017-06-02
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:

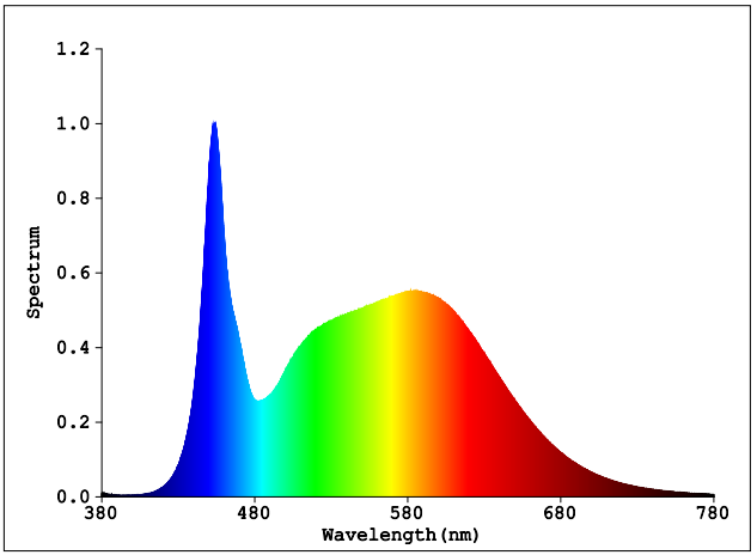
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.9	60	0.9465	112.2	0.9861

Color Data:

Parameter	Result
CCT (K)	5135
Color Rendering Index (CRI)	84.8
R9	14
Chromaticity, x	0.3416
Chromaticity, y	0.3516
Chromaticity u′	0.2090
Chromaticity v′	0.4842
Duv	0.00144

Special Color Rendering			
R1	84	R9	14
R2	91	R10	78
R3	95	R11	83
R4	83	R12	62
R5	84	R13	86
R6	87	R14	97
R7	87	R15	79
R8	68	-	-

Spectrum Diagram:



Goniophotometer Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
24.6	38	Face Down	90	25

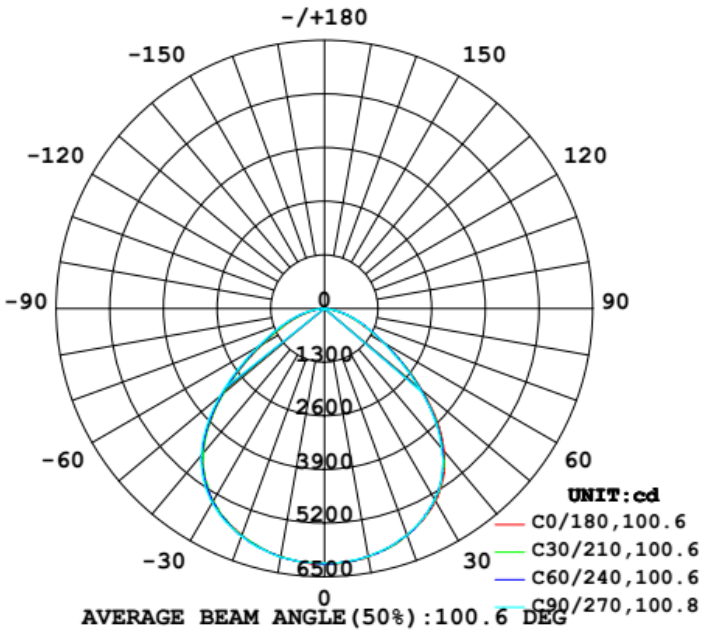
Electrical Data:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.1	60	0.9463	112.2	0.9880

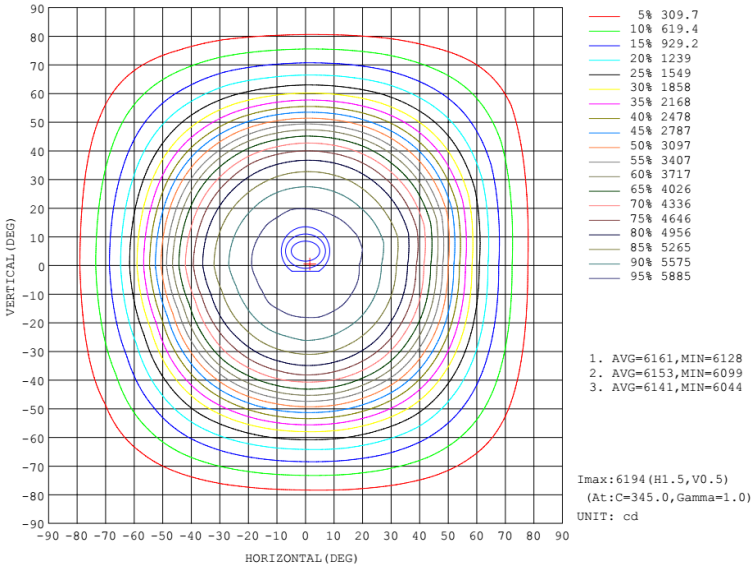
Goniophotometer Data:

Parameter	Result
Total Luminous (lm)	15083
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	134.37
Zonal Lumens Distribution (20-50°)	57.8%
Beam Angle (°)	100.6
Center Beam Candle Power (cd)	6197

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	6113	6102	6094	6072	6099	6101	6116	6118	0- 10	586.6	586.6	3.89,3.89
20	5845	5839	5846	5808	5846	5870	5878	5893	10- 20	1695	2282	15.1,15.1
30	5384	5365	5336	5286	5401	5405	5439	5449	20- 30	2604	4886	32.4,32.4
40	4520	4468	4424	4368	4579	4564	4643	4673	30- 40	3128	8014	53.1,53.1
50	3092	3064	2991	2926	3187	3208	3313	3363	40- 50	2983	10997	72.9,72.9
60	1645	1693	1633	1591	1735	1788	1876	1912	50- 60	2146	13144	87.1,87.1
70	767.6	837.5	825.4	783.1	841.2	901.2	978.1	960.5	60- 70	1243	14386	95.4,95.4
80	195.8	227.4	220.1	184.8	257.3	278.4	340.9	319.6	70- 80	577.7	14964	99.2,99.2
90	1.648	1.774	1.900	1.648	1.521	2.056	2.395	2.484	80- 90	76.50	15040	99.7,99.7
100	2.026	3.166	2.846	3.169	2.284	1.958	2.604	1.710	90-100	2.156	15043	99.7,99.7
110	4.372	5.319	5.570	5.519	4.187	3.734	4.631	3.479	100-110	3.613	15046	99.8,99.8
120	7.628	7.851	8.360	8.936	6.273	5.950	7.161	5.635	110-120	5.726	15052	99.8,99.8
130	11.15	9.498	11.78	10.45	9.064	7.280	9.000	7.085	120-130	7.436	15059	99.8,99.8
140	11.60	10.32	13.18	8.739	9.822	8.544	10.45	7.662	130-140	7.712	15067	99.9,99.9
150	12.29	12.60	11.66	11.53	9.518	8.864	10.83	8.544	140-150	6.727	15074	99.9,99.9
160	11.73	12.28	11.28	12.35	10.27	9.182	10.77	9.942	150-160	5.034	15079	100,100
170	13.75	12.66	11.59	13.05	12.36	10.88	11.47	11.39	160-170	3.079	15082	100,100
180	14.19	13.17	12.99	12.98	13.88	12.79	13.11	12.92	170-180	1.218	15083	100,100
DEG	LUMINOUS INTENSITY:cd Less than 25% Percent = 6.0 %									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	6189	6184	6170	6186	6183	6192	6171	6187	6186	6179	6192	6189	6189	6184	6170	6186	6183	6192	6171
5	6168	6167	6161	6146	6167	6171	6156	6157	6153	6155	6152	6161	6177	6172	6160	6172	6165	6169	6170
10	6113	6103	6108	6102	6095	6094	6094	6081	6108	6072	6088	6084	6099	6110	6103	6101	6115	6111	6116
15	5997	6004	6006	5998	5998	5999	5991	5977	5976	5967	5967	5974	5997	6009	6000	5992	6010	5998	6012
20	5845	5853	5847	5839	5845	5845	5846	5817	5821	5808	5802	5806	5846	5856	5844	5870	5864	5887	5878
25	5656	5651	5631	5627	5635	5628	5621	5603	5602	5589	5581	5590	5654	5663	5646	5645	5663	5684	5694
30	5384	5372	5357	5365	5339	5348	5336	5317	5299	5286	5288	5295	5401	5403	5391	5405	5415	5419	5439
35	5019	5006	4977	4982	4971	4958	4945	4912	4909	4884	4885	4907	5041	5038	5053	5051	5058	5080	5093
40	4520	4500	4471	4468	4461	4443	4424	4401	4368	4368	4342	4370	4579	4547	4561	4564	4621	4627	4643
45	3861	3847	3823	3816	3791	3789	3763	3719	3695	3681	3655	3668	3936	3918	3938	3931	3986	3996	4046
50	3092	3091	3062	3064	3032	3031	2991	2954	2933	2926	2894	2904	3187	3177	3181	3208	3250	3295	3313
55	2319	2322	2326	2315	2294	2280	2259	2231	2204	2201	2173	2156	2418	2406	2443	2442	2489	2518	2547
60	1645	1660	1664	1693	1666	1662	1633	1621	1600	1591	1542	1530	1735	1731	1758	1788	1834	1848	1876
65	1142	1159	1174	1210	1201	1204	1174	1171	1157	1138	1086	1069	1218	1218	1249	1290	1330	1340	1359
70	768	788	800	837	844	847	825	824	806	783	740	726	841	845	873	901	951	962	978
75	467	475	487	514	522	525	510	505	488	461	426	419	531	530	553	581	623	641	654
80	196	207	209	227	235	235	220	217	204	185	160	149	257	258	270	278	318	332	341
85	14.2	15.8	15.8	17.3	16.8	16.4	14.9	15.0	13.8	13.5	12.5	12.4	20.9	21.7	27.0	36.7	55.2	57.6	68.2
90	1.65	1.65	1.77	1.77	1.90	1.84	1.90	1.90	1.78	1.65	1.65	1.59	1.52	1.97	1.52	2.06	1.90	2.15	2.40
95	1.65	2.03	1.71	2.16	1.84	2.35	1.84	2.41	1.77	2.15	1.65	1.97	1.71	1.58	1.78	1.77	1.97	1.84	2.03
100	2.03	2.79	2.27	3.17	2.59	3.36	2.85	3.42	2.66	3.17	2.21	2.86	2.28	1.84	2.53	1.96	2.60	1.90	2.60
105	2.91	3.68	3.10	4.24	3.67	4.51	3.99	4.56	3.80	4.37	3.16	3.87	3.17	2.65	3.17	2.72	3.43	2.85	3.55
110	4.37	5.14	4.36	5.32	5.00	6.03	5.57	6.09	5.13	5.52	4.74	5.33	4.19	3.54	4.12	3.73	4.57	3.93	4.63
115	5.13	5.58	5.12	6.71	6.33	7.48	6.97	7.60	6.45	7.16	6.21	5.97	5.45	4.62	5.20	4.93	5.71	5.13	5.84
120	7.63	8.12	6.14	7.85	8.17	8.95	8.36	8.99	8.23	8.94	7.28	8.89	6.27	5.76	6.14	5.95	6.98	6.46	7.16
125	9.95	9.70	7.66	8.61	9.82	10.8	10.1	10.9	9.82	10.1	7.22	10.2	6.34	6.02	7.09	6.90	8.05	7.66	8.17
130	11.1	10.6	10.3	9.50	10.3	12.2	11.8	12.6	10.7	10.4	9.75	11.3	9.06	7.79	7.09	7.28	8.68	8.18	9.00
135	11.7	10.8	11.4	9.50	10.3	12.2	12.7	12.9	11.2	9.88	12.2	12.0	9.76	8.30	7.72	8.23	9.13	9.00	9.69
140	11.6	10.7	12.3	10.3	10.7	12.1	13.2	12.9	11.3	8.74	13.4	12.2	9.82	8.81	8.87	8.54	9.70	9.69	10.5
145	12.1	11.8	12.7	12.0	10.5	11.4	13.3	12.9	11.2	9.89	13.6	12.9	9.82	9.19	10.3	8.74	10.1	10.1	10.8
150	12.3	11.8	12.9	12.6	8.62	11.4	11.7	12.1	9.83	11.5	12.9	12.8	9.52	10.7	11.0	8.86	10.5	10.2	10.8
155	12.7	11.8	12.2	12.6	9.06	11.4	11.2	11.0	9.38	12.4	12.2	12.3	10.9	10.8	10.8	9.56	10.8	10.8	10.8
160	11.7	11.1	11.1	12.3	9.82	11.0	11.3	10.0	9.38	12.3	11.8	11.8	10.3	10.4	10.8	9.18	10.7	11.2	10.8
165	10.6	10.3	11.6	12.6	11.1	12.1	11.2	11.0	10.2	12.7	11.6	10.5	10.3	10.3	10.8	9.18	10.8	10.8	10.2
170	13.7	14.3	13.0	12.7	12.0	13.0	11.6	12.0	11.0	13.0	12.2	13.6	12.4	12.0	12.6	10.9	11.4	10.6	11.5
175	14.4	14.0	13.8	12.7	13.2	13.8	12.3	12.4	12.2	13.0	12.8	14.0	13.4	12.8	13.3	12.2	12.9	12.7	13.0
180	14.2	14.6	13.6	13.2	13.7	13.9	13.0	12.7	12.9	13.0	12.9	14.0	13.9	14.0	13.8	12.8	13.6	13.2	13.1

Table--2 UNIT: cd

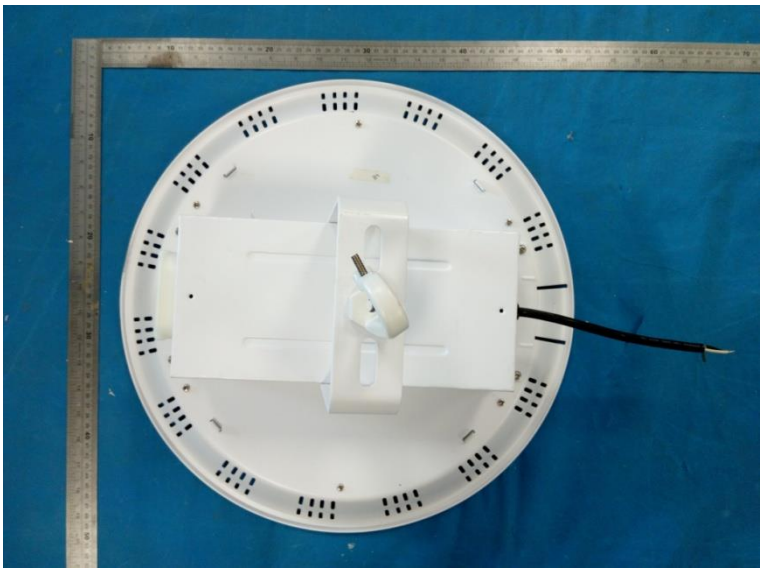
γ (DEG) \ C(DEG)	285	300	315	330	345
0	6187	6186	6179	6192	6189
5	6168	6168	6174	6174	6177
10	6110	6119	6118	6131	6121
15	6022	6036	6032	6035	6042
20	5877	5879	5893	5897	5904
25	5696	5694	5697	5720	5735
30	5442	5453	5449	5476	5483
35	5109	5126	5127	5141	5168
40	4657	4679	4673	4711	4736
45	4059	4086	4078	4128	4135
50	3332	3355	3363	3398	3412
55	2572	2598	2606	2626	2608
60	1894	1918	1912	1914	1903
65	1369	1386	1362	1352	1323
70	988	989	961	942	913
75	661	654	627	611	588
80	347	343	320	318	311
85	75.4	81.5	62.8	47.5	31.5
90	2.35	3.13	2.48	3.84	2.92
95	1.84	1.96	1.71	1.71	1.59
100	1.90	2.54	1.71	2.28	1.59
105	2.59	3.23	2.53	2.98	2.22
110	3.67	4.12	3.48	3.87	3.17
115	4.87	5.32	4.56	4.94	4.50
120	6.14	6.59	5.64	5.77	5.33
125	7.66	7.61	6.71	6.46	5.65
130	8.29	8.05	7.08	7.54	6.91
135	8.74	8.50	7.72	9.06	7.87
140	9.24	9.38	7.66	10.1	8.19
145	9.81	9.70	7.66	10.1	8.69
150	10.0	9.63	8.54	10.1	8.82
155	10.0	9.89	9.50	10.1	9.77
160	10.6	9.95	9.94	10.1	9.84
165	10.6	9.89	9.94	10.0	9.84
170	10.6	11.4	11.4	11.6	12.1
175	11.6	12.8	12.7	12.6	12.9
180	12.0	12.9	12.9	13.1	14.0

THD and PF Measurement Test Result:

Electrical Measurement:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD
277.01	60	0.4520	110.3	0.8810	18.47

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*******