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):
502285##

Representative (Tested) Model:
50228561

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

Prepare By:

Engineer: Leo Liu
Date: 2017-08-23

Review By:

Technical Lead: Vincent Yuan
Date: 2017-08-24

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:	502285XX (XX=61-70)
Product type:	High Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	AC120-277V, 50/ 60Hz, 270W
Declared CCT:	5000K
Declared Light output:	38000 lm
LED Manufacturer:	Samsung
LED Model:	SPMWH1228
LED Quantity:	1280 pcs
Forward current of LED Chip:	120mA
Driver model:	EUC-320S280DT
Date of Receipt Samples:	2017-08-21
Quantity of Receipt Samples:	1
Sample Number:	170821001-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:	2017-08-24
Revised Date of Test Report:	N/A
Test Report No.:	NTCR17080077
Remark (*If applicable*)	N/A

Test Specifications:	
Date of Test	2017-08-23
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 °C	41 %	Face Down	90 min	25 min

Electrical Data:

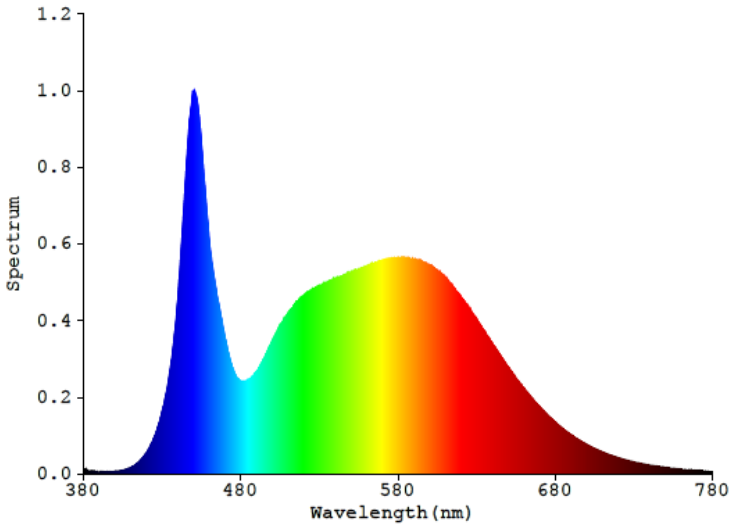
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	2.274	269.8	0.9942

Color Data:

Parameter	Result
CCT (K)	5240
Color Rendering Index (CRI)	85.1
R9	21
Chromaticity, x	0.3385
Chromaticity, y	0.3436
Chromaticity u'	0.2101
Chromaticity v'	0.4797
Duv	-0.00134

Special Color Rendering			
R1	84	R9	21
R2	89	R10	74
R3	92	R11	85
R4	86	R12	65
R5	85	R13	86
R6	85	R14	96
R7	88	R15	81
R8	72	-	-

Spectrum Diagram:



Goniophotemeter Test Results:

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.0 °C	41 %	Face Down	90 min	25 min

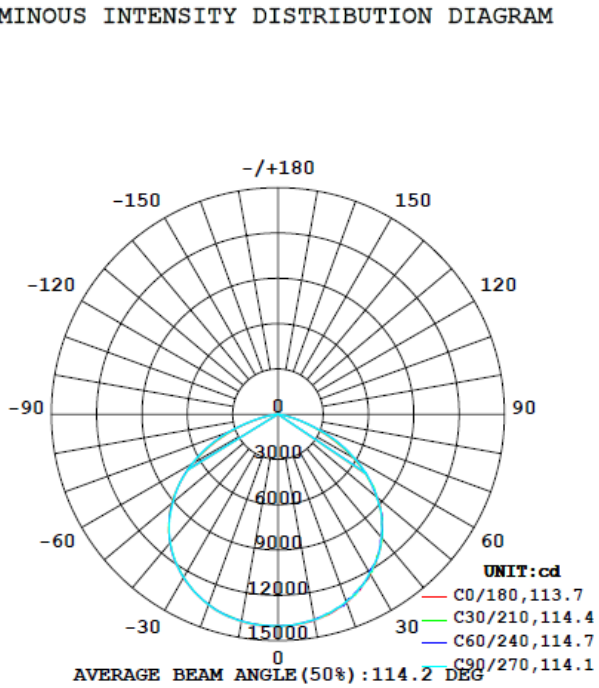
Electrical Data:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	2.274	269.8	0.9942

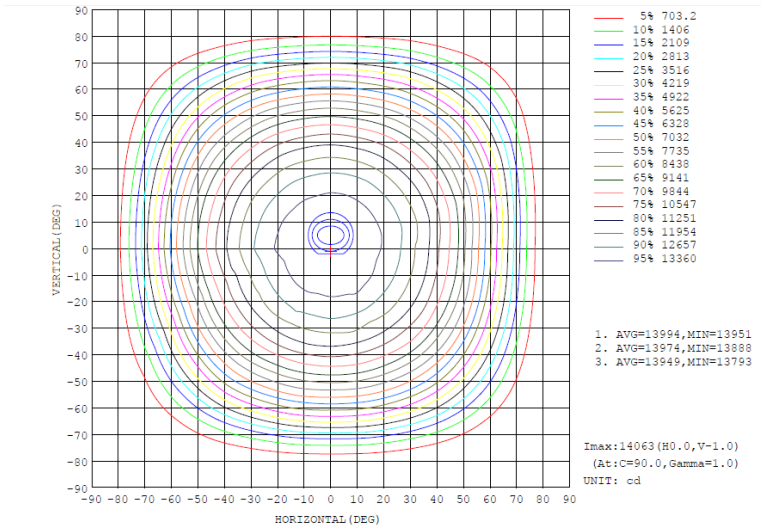
Goniophotometer Data:

Parameter	Result
Total Luminous (lm)	39222.7
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	145.37
Zonal Lumens Distribution (20-50°)	53.3%
Beam Angle (°)	114.2

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	1388	1380	1383	1376	1395	1389	1392	1389	0- 10	1331	1331	3.39,3.39
20	1328	1325	1322	1325	1345	1339	1344	1338	10- 20	3854	5185	13.2,13.2
30	1220	1212	1214	1224	1253	1247	1250	1246	20- 30	5938	11122	28.4,28.4
40	1067	1067	1066	1069	1110	1106	1109	1102	30- 40	7300	18422	47,47
50	859.8	860.5	854.2	859.5	918.1	911.6	907.5	902.0	40- 50	7655	26077	66.5,66.5
60	572.8	590.7	588.1	595.7	647.8	656.5	656.0	646.1	50- 60	6754	32831	83.7,83.7
70	245.3	266.2	261.9	258.6	321.2	343.0	347.2	333.4	60- 70	4549	37380	95.3,95.3
80	23.49	30.47	31.31	29.79	55.48	62.01	69.74	60.81	70- 80	1631	39011	99.5,99.5
90	0.2305	0.7224	0.2327	0.6806	0.6000	1.013	1.660	0.9855	80- 90	128.1	39139	99.8,99.8
100	0.3738	0.5234	0.4955	0.5093	0.4012	0.3595	0.4459	0.3604	90-100	3.471	39143	99.8,99.8
110	0.8721	1.024	1.057	0.9918	0.8805	0.8485	0.9882	0.8294	100-110	7.038	39150	99.8,99.8
120	1.569	1.430	1.606	1.539	1.402	1.330	1.543	1.320	110-120	11.67	39162	99.8,99.8
130	1.995	1.622	2.045	1.616	1.837	1.524	1.859	1.506	120-130	14.44	39176	99.9,99.9
140	2.113	2.208	2.246	1.809	1.974	1.711	2.046	1.580	130-140	14.62	39191	99.9,99.9
150	2.333	2.425	2.090	2.401	1.938	1.786	2.185	1.801	140-150	12.96	39204	100,100
160	2.307	2.450	2.201	2.484	2.106	1.917	2.265	2.147	150-160	10.19	39214	100,100
170	2.926	2.587	2.581	2.729	2.597	2.344	2.414	2.419	160-170	6.609	39220	100,100
180	2.998	2.740	2.852	2.762	2.972	2.669	2.859	2.742	170-180	2.599	39223	100,100
DEG	LUMINOUS INTENSITY:×10cd Less than 35% Percent = 10.5 %									UNIT:lm		

Luminous Distribution Intensity Data:

Table--1 UNIT: ×10cd

γ (DEG) \ C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1405	1402	1401	1401	1401	1400	1400	1404	1405	1400	1398	1397	1405	1402	1401	1401	1401	1400	1400
5	1401	1394	1398	1394	1397	1397	1396	1399	1398	1393	1395	1395	1406	1401	1399	1398	1401	1401	1405
10	1388	1385	1381	1380	1383	1379	1383	1382	1384	1376	1380	1379	1395	1391	1391	1389	1391	1391	1392
15	1363	1360	1356	1359	1361	1361	1359	1360	1354	1353	1354	1357	1376	1373	1371	1370	1372	1371	1376
20	1328	1320	1321	1325	1321	1319	1322	1331	1320	1325	1313	1320	1345	1341	1341	1339	1341	1340	1344
25	1286	1281	1270	1277	1278	1271	1269	1275	1271	1276	1276	1272	1304	1300	1301	1298	1301	1300	1302
30	1220	1213	1216	1212	1210	1219	1214	1218	1217	1224	1211	1214	1253	1249	1248	1247	1249	1249	1250
35	1150	1156	1144	1152	1153	1150	1159	1161	1146	1154	1151	1152	1188	1186	1185	1185	1188	1183	1186
40	1067	1064	1073	1067	1069	1068	1066	1070	1067	1069	1066	1075	1110	1108	1111	1106	1112	1107	1109
45	977	968	981	981	971	979	971	967	970	967	964	978	1019	1017	1022	1020	1021	1015	1018
50	860	858	853	860	857	859	854	856	850	859	860	858	918	916	916	912	912	906	908
55	722	725	724	729	730	729	732	735	736	732	726	731	790	789	795	786	792	788	791
60	573	569	580	591	592	594	588	594	591	596	580	580	648	647	655	656	656	651	656
65	407	412	420	431	438	439	436	439	429	434	421	418	488	487	500	506	511	506	510
70	245	252	254	266	268	273	262	265	261	259	250	253	321	322	335	343	353	344	347
75	110	111	111	118	119	121	118	120	116	113	106	111	167	170	176	181	188	186	189
80	23.5	25.8	27.4	30.5	32.2	33.1	31.3	32.5	30.9	29.8	25.7	25.5	55.5	56.2	60.2	62.0	68.0	66.9	69.7
85	2.84	2.69	2.68	2.83	2.95	3.10	2.79	2.89	2.83	2.81	2.57	2.63	6.14	6.89	8.41	9.26	10.3	9.96	10.5
90	0.23	0.20	0.21	0.72	0.23	0.23	0.23	0.71	0.23	0.68	0.22	0.19	0.60	0.63	0.95	1.01	1.37	1.38	1.66
95	0.25	0.26	0.22	0.29	0.23	0.30	0.26	0.32	0.26	0.30	0.22	0.26	0.25	0.26	0.27	0.27	0.28	0.26	0.27
100	0.37	0.46	0.42	0.52	0.47	0.53	0.50	0.54	0.47	0.51	0.39	0.44	0.40	0.33	0.42	0.36	0.44	0.38	0.45
105	0.61	0.70	0.64	0.77	0.73	0.81	0.78	0.78	0.70	0.74	0.62	0.66	0.63	0.57	0.62	0.58	0.67	0.64	0.70
110	0.87	0.92	0.82	1.02	1.01	1.09	1.06	1.07	0.95	0.99	0.89	0.90	0.88	0.82	0.83	0.85	0.95	0.93	0.99
115	1.05	1.08	1.04	1.21	1.29	1.40	1.35	1.37	1.23	1.29	1.08	1.12	1.14	1.08	1.06	1.09	1.24	1.21	1.32
120	1.57	1.48	1.28	1.43	1.50	1.64	1.61	1.66	1.47	1.54	1.18	1.51	1.40	1.30	1.30	1.33	1.49	1.47	1.54
125	1.72	1.68	1.63	1.57	1.61	1.83	1.79	1.91	1.66	1.58	1.54	1.71	1.46	1.49	1.50	1.50	1.68	1.64	1.70
130	2.00	1.91	1.87	1.62	1.73	1.99	2.04	2.10	1.81	1.62	1.96	1.89	1.84	1.71	1.51	1.52	1.73	1.75	1.86
135	2.13	2.10	2.05	1.89	1.91	2.01	2.22	2.12	1.88	1.62	2.15	2.12	1.96	1.84	1.59	1.71	1.81	1.89	2.00
140	2.11	2.10	2.27	2.21	1.87	2.16	2.25	2.14	1.87	1.81	2.27	2.25	1.97	1.89	1.78	1.71	1.96	1.96	2.05
145	2.34	2.35	2.41	2.34	1.81	2.20	2.26	2.15	1.73	2.17	2.28	2.39	1.94	2.00	2.02	1.75	2.02	2.01	2.08
150	2.33	2.37	2.40	2.43	1.81	2.22	2.09	2.12	1.72	2.40	2.39	2.45	1.94	2.13	2.24	1.79	2.05	2.03	2.18
155	2.44	2.39	2.31	2.45	2.02	2.23	2.19	2.11	1.98	2.47	2.34	2.38	2.16	2.14	2.26	1.88	2.14	2.06	2.20
160	2.31	2.37	2.23	2.45	2.32	2.28	2.20	2.17	2.28	2.48	2.30	2.27	2.11	2.10	2.27	1.92	2.30	2.35	2.27
165	2.43	2.32	2.51	2.50	2.60	2.64	2.55	2.60	2.57	2.58	2.46	2.27	2.16	2.12	2.27	2.04	2.23	2.29	2.15
170	2.93	2.99	2.78	2.59	2.71	2.85	2.58	2.70	2.66	2.73	2.70	2.83	2.60	2.55	2.60	2.34	2.52	2.38	2.41
175	3.04	3.00	2.95	2.66	2.91	3.00	2.74	2.73	2.81	2.79	2.84	2.84	2.77	2.64	2.86	2.57	2.73	2.75	2.77
180	3.00	3.04	2.88	2.74	2.91	2.98	2.85	2.72	2.81	2.76	2.72	2.77	2.97	2.96	2.92	2.67	2.85	2.93	2.86

Table--2 UNIT: ×10cd

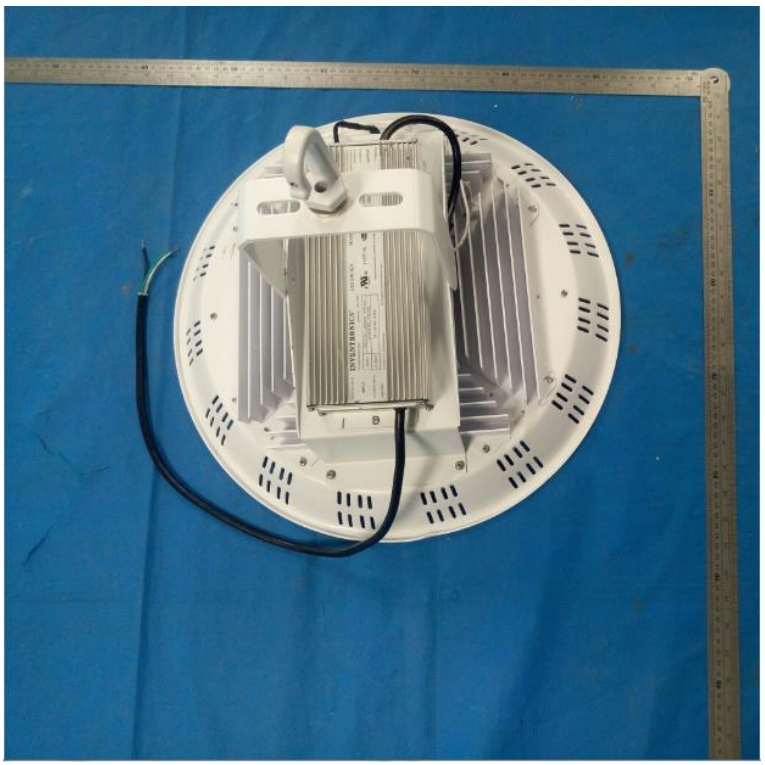
γ (DEG) \ C (DEG)	285	300	315	330	345														
0	1404	1405	1400	1398	1397														
5	1400	1400	1397	1396	1398														
10	1391	1391	1389	1388	1386														
15	1373	1371	1366	1368	1367														
20	1343	1341	1338	1335	1334														
25	1301	1301	1297	1294	1294														
30	1250	1250	1246	1244	1241														
35	1184	1184	1179	1180	1179														
40	1105	1107	1102	1105	1100														
45	1011	1014	1011	1014	1010														
50	904	906	902	905	901														
55	785	787	782	784	777														
60	650	653	646	646	633														
65	503	506	494	489	475														
70	344	348	333	327	312														
75	186	186	176	173	164														
80	67.5	67.9	60.8	59.2	53.3														
85	10.3	10.9	9.53	8.80	6.26														
90	1.36	1.43	0.99	0.98	0.50														
95	0.25	0.28	0.24	0.25	0.31														
100	0.37	0.43	0.36	0.41	0.32														
105	0.61	0.67	0.57	0.60	0.54														
110	0.90	0.88	0.83	0.83	0.81														
115	1.16	1.16	1.09	1.07	1.08														
120	1.46	1.41	1.32	1.24	1.29														
125	1.64	1.59	1.44	1.45	1.41														
130	1.73	1.65	1.51	1.62	1.60														
135	1.82	1.71	1.65	1.81	1.66														
140	1.94	1.82	1.58	1.93	1.72														
145	2.01	1.90	1.54	2.18	1.92														
150	2.13	1.97	1.80	2.23	2.17														
155	2.12	2.18	2.14	2.23	2.16														
160	2.17	2.10	2.15	2.22	2.17														
165	2.21	2.06	2.21	2.20	2.19														
170	2.28	2.39	2.42	2.43	2.60														
175	2.49	2.65	2.63	2.66	2.65														
180	2.66	2.80	2.74	2.71	2.76														

THD and PF Measurement Test Result:

Electrical Measurement:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD
277.0	60	1.051	269.5	0.929	17.01

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*******