LM-79-08 Test Report

For

ETI Solid State Lighting (Zhuhai) Ltd

No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China

High Bay

Model Name(s):
502421##

Representative (Tested) Model:
50242161

Model Difference: ##=61-70, identifies 5000K

Prepare by:

Derek Lai

Engineer: Derek Lai
Date: 2019-08-20

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan
Issue Date: 2019-08-23
Revised Date: N/A

Note:
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Product Information:

Client Name:	ETI Solid State Lighting (Zhuhai) Ltd
Brand Name:	ETI
Model Number:	502421##(##=61-70)
Product Type:	High Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	120-277Vac, 50/60Hz, 138W
Declared CCT:	5000 K
Declared Light Output:	18000 lm
LED Manufacturer:	Samsung
LED Model:	SPMWH1228FD5WARMXX
LED Quantity:	544 pcs
Driver Manufacturer:	ECU ELECTRONICS INDUSTRIAL CO., LTD
Driver Model:	YX-138D-680mA

Test Information:

Standard Lamp:	Total Spectral Radiant Flux Standard Lamp, trace to NIST. 1. D908S for Gonio 2. D215S for Integrating Sphere
Date of Receipt Samples:	2019-07-23
Quantity of Receipt Samples:	1 pcs
Sample Number:	190723004-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:	2019-08-23
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR19080082
Remark *(If applicable)*:	N/A

Test Specification:	
Date of Test	2019-08-01
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 C78.377-2017 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 required Voltage and Frequency. It was stabilized before measurement was made. Luminous Flux, Luminaire Efficacy and Zonal Lumen were calculated from the software taken at 1° vertical intervals and 15° horizonal intervals.

2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, as spectroradiometer and software. The ambient temperature condition inside the sphere was measured at 25 °C± 1°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 require Voltage and Frequency. 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 1 nm intervals over the rage 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 requirement Voltage and Frequency, and was stabilized before measurement. The Total Harmonic Distortion was calculated from the Digital Power Meter.

Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.8	40.7	Face Down	90	10

Electrical Data:

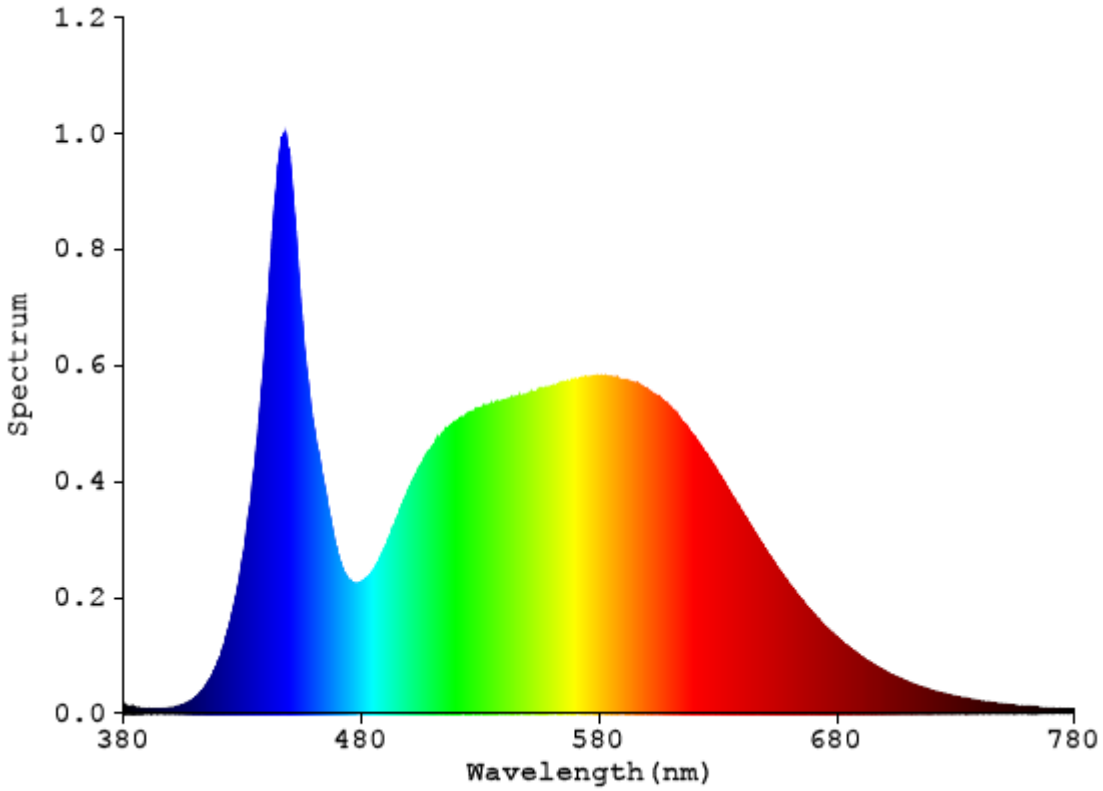
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.154	138.1	0.9974

Color Data:

Parameter	Result
CCT(K)	5263
Ra	84.0
R9	17
Chromaticity, x	0.3381
Chromaticity, y	0.3462
Chromaticity, u'	0.2088
Chromaticity, v'	0.4810
Duv	0.00016

Special Color Rendering			
R1	83	R9	17
R2	87	R10	70
R3	90	R11	86
R4	86	R12	68
R5	85	R13	84
R6	83	R14	94
R7	87	R15	79
R8	72	-	-

Spectrum Diagram:



Goniophotometer Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.8	40.7	Face Down	90	25

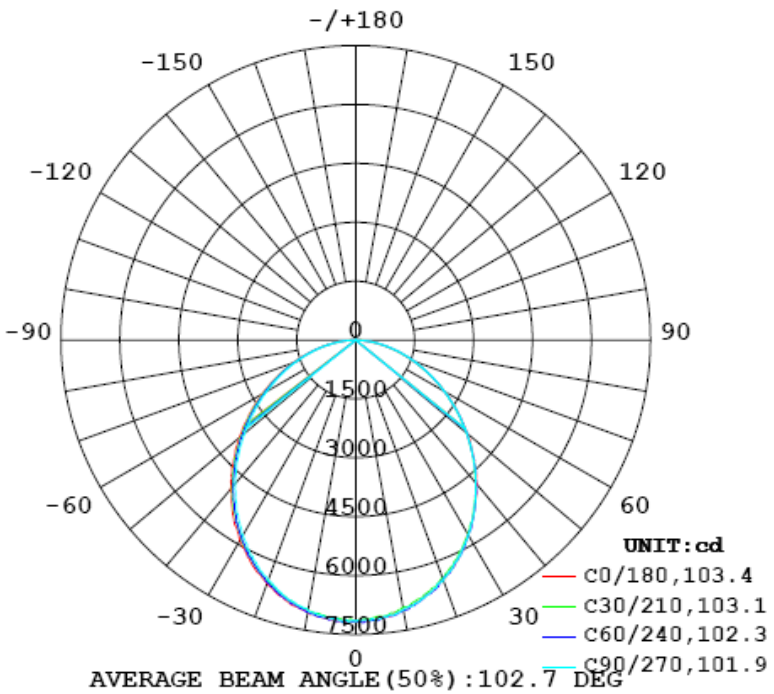
Electrical Data:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.154	138.1	0.9974

Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	18529.1
Luminous Efficacy (lm/w)	134.17
Zonal Lumens Distribution (20-50°)	51.1%
Beam Angle (°)	102.7

Luminous Intensity Distribution Diagram:

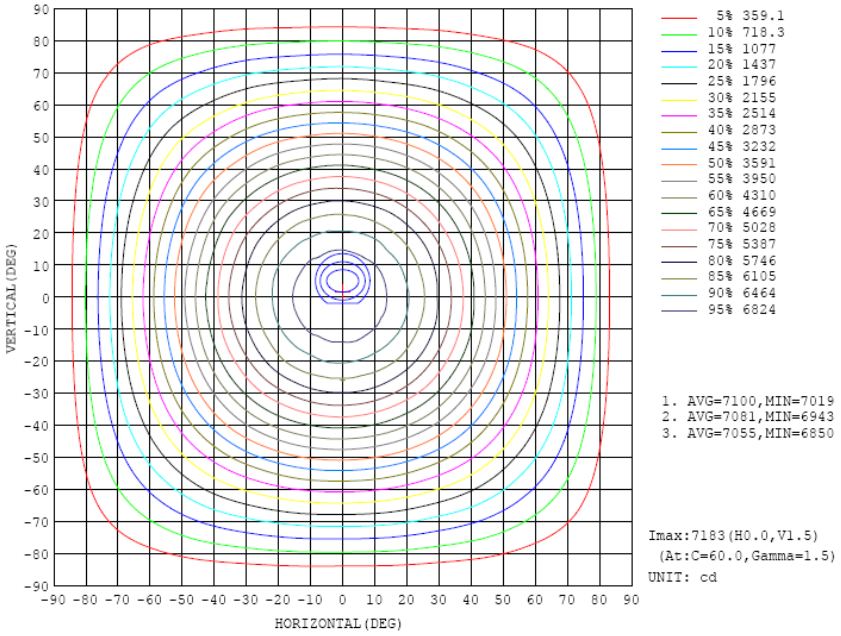


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	6955	6992	6970	6999	7022	7013	6993	6987	0- 10	675.4	675.4	3.64,3.64
20	6493	6491	6505	6535	6592	6565	6511	6441	10- 20	1915	2591	14,14
30	5718	5744	5726	5789	5884	5835	5736	5722	20- 30	2843	5434	29.3,29.3
40	4801	4772	4748	4845	4963	4859	4767	4746	30- 40	3319	8753	47.2,47.2
50	3697	3696	3677	3774	3861	3781	3687	3673	40- 50	3300	12053	65.1,65.1
60	2597	2606	2594	2667	2753	2685	2613	2592	50- 60	2848	14901	80.4,80.4
70	1556	1592	1579	1645	1694	1648	1608	1572	60- 70	2096	16997	91.7,91.7
80	626.1	675.2	684.0	723.3	733.9	721.2	704.1	665.2	70- 80	1203	18200	98.2,98.2
90	0.4486	0.3697	0.4069	0.3420	1.042	1.357	0.9987	1.099	80- 90	313.0	18513	99.9,99.9
100	0.9994	0.7671	0.7430	0.7275	1.735	1.701	1.775	1.796	90-100	1.083	18514	99.9,99.9
110	1.385	1.042	1.123	1.089	2.020	1.999	2.149	2.087	100-110	1.544	18516	99.9,99.9
120	1.986	1.586	1.632	1.646	2.390	2.295	2.367	2.356	110-120	1.780	18517	99.9,99.9
130	2.718	2.600	2.324	2.609	3.253	3.746	3.374	3.666	120-130	2.209	18520	99.9,99.9
140	3.029	3.187	3.353	3.203	4.075	4.721	4.922	4.646	130-140	2.688	18522	100,100
150	3.411	3.458	3.604	3.572	4.924	5.385	5.757	5.427	140-150	2.619	18525	100,100
160	4.145	4.015	3.532	4.113	5.895	6.210	5.794	6.115	150-160	2.177	18527	100,100
170	4.560	4.592	4.439	4.551	5.834	6.163	6.112	5.912	160-170	1.452	18529	100,100
180	5.403	5.497	5.394	5.340	5.385	5.491	5.389	5.324	170-180	0.5036	18529	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 14.0 %									UNIT:lm		

Isocandela Diagram:



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	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152	7152
5	7094	7105	7051	7124	7131	7102	7105	7101	7134	7095	7101	7118	7134	7139	7094	7104	7139	7109	7117
10	6955	6966	6918	6992	6985	6979	6970	6988	7019	6999	7029	7015	7022	7037	6999	7013	7036	6987	6993
15	6769	6772	6722	6762	6787	6787	6791	6770	6819	6825	6849	6831	6868	6857	6794	6852	6834	6811	6797
20	6493	6497	6448	6491	6498	6490	6505	6502	6542	6535	6586	6563	6592	6555	6549	6565	6580	6520	6511
25	6181	6143	6125	6144	6155	6107	6166	6151	6201	6198	6244	6242	6281	6230	6209	6220	6220	6162	6166
30	5718	5746	5715	5744	5729	5724	5726	5740	5779	5789	5836	5861	5884	5856	5817	5835	5816	5755	5736
35	5269	5288	5221	5272	5286	5253	5254	5289	5311	5340	5372	5399	5455	5411	5367	5354	5356	5310	5290
40	4801	4802	4747	4772	4765	4752	4748	4776	4825	4845	4902	4912	4963	4912	4889	4859	4860	4785	4767
45	4252	4264	4228	4240	4244	4245	4223	4248	4307	4320	4359	4383	4403	4398	4368	4326	4317	4257	4246
50	3697	3715	3679	3696	3704	3678	3677	3705	3748	3774	3813	3823	3861	3850	3796	3781	3772	3720	3687
55	3142	3161	3122	3151	3152	3148	3150	3155	3200	3219	3253	3279	3314	3298	3261	3241	3229	3170	3147
60	2597	2620	2594	2606	2596	2591	2594	2624	2645	2667	2698	2718	2753	2734	2701	2685	2682	2638	2613
65	2070	2093	2063	2089	2073	2086	2078	2102	2119	2153	2166	2181	2206	2178	2181	2147	2145	2105	2094
70	1556	1589	1557	1592	1573	1598	1579	1611	1619	1645	1657	1666	1694	1667	1667	1648	1645	1608	1608
75	1077	1104	1084	1114	1106	1127	1122	1143	1148	1168	1166	1184	1198	1174	1178	1158	1170	1139	1138
80	626	651	644	675	672	689	684	703	706	723	718	721	734	712	725	721	729	702	704
85	210	238	233	260	261	267	268	279	285	297	290	297	305	288	308	299	314	292	284
90	0.45	0.36	0.65	0.37	0.34	0.37	0.41	0.36	0.76	0.34	0.91	0.34	1.04	4.14	1.02	1.36	0.99	1.53	1.00
95	0.81	0.64	0.63	0.56	0.56	0.55	0.55	0.53	0.51	0.50	0.57	0.54	1.39	1.40	1.39	1.33	1.32	1.37	1.38
100	1.00	0.80	0.76	0.77	0.76	0.74	0.74	0.73	0.73	0.73	0.71	0.69	1.74	1.67	1.66	1.70	1.70	1.75	1.77
105	1.18	1.01	0.91	0.90	0.93	0.94	0.94	0.94	0.93	0.89	0.87	0.95	1.96	1.96	1.87	1.94	1.98	2.04	2.06
110	1.39	1.21	1.09	1.04	1.07	1.10	1.12	1.12	1.11	1.09	1.07	1.18	2.02	2.09	1.94	2.00	2.05	2.12	2.15
115	1.58	1.43	1.36	1.28	1.31	1.33	1.35	1.35	1.35	1.33	1.33	1.39	2.04	2.11	2.04	2.06	2.12	2.17	2.20
120	1.99	1.77	1.92	1.59	1.63	1.57	1.63	1.64	1.65	1.65	1.89	1.73	2.39	2.41	2.60	2.30	2.32	2.35	2.37
125	2.36	2.04	2.26	2.06	1.99	1.94	1.96	1.95	1.97	2.08	2.29	2.03	2.77	2.70	3.05	2.84	2.72	2.77	2.80
130	2.72	2.58	2.60	2.60	2.44	2.37	2.32	2.31	2.40	2.61	2.54	2.32	3.25	3.33	3.54	3.75	3.38	3.37	3.37
135	3.02	2.96	2.89	2.91	3.00	3.02	2.84	2.94	3.00	2.96	2.79	2.67	3.64	3.81	4.01	4.37	4.39	4.36	4.18
140	3.03	3.06	3.04	3.19	3.36	3.42	3.35	3.36	3.36	3.20	2.99	2.92	4.07	4.19	4.30	4.72	4.98	4.97	4.92
145	3.35	3.33	3.15	3.34	3.51	3.55	3.57	3.53	3.52	3.35	3.05	3.16	4.50	4.61	4.53	5.11	5.33	5.45	5.53
150	3.41	3.55	3.58	3.46	3.48	3.61	3.60	3.58	3.60	3.57	3.29	3.36	4.92	5.00	5.13	5.39	5.67	5.74	5.76
155	3.75	3.81	3.96	3.54	3.56	3.75	3.63	3.77	3.81	3.62	3.89	3.58	5.34	5.39	5.76	5.66	5.76	6.02	5.95
160	4.14	4.11	4.16	4.01	3.61	3.56	3.53	3.71	3.89	4.11	4.12	3.95	5.89	5.83	6.02	6.21	6.06	5.94	5.79
165	4.22	4.33	4.32	4.33	4.05	4.08	4.09	4.19	4.40	4.41	4.33	4.20	5.82	5.86	6.02	6.31	6.38	6.24	6.22
170	4.56	4.61	4.57	4.59	4.32	4.32	4.44	4.32	4.59	4.55	4.47	4.52	5.83	5.93	6.00	6.16	6.21	6.01	6.11
175	5.05	5.17	5.18	5.08	4.85	4.79	4.67	4.66	4.86	4.88	4.98	5.01	5.81	5.87	5.90	5.88	5.93	5.67	5.62
180	5.40	5.48	5.46	5.50	5.41	5.34	5.39	5.16	5.28	5.34	5.29	5.34	5.39	5.47	5.47	5.49	5.39	5.34	5.39

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	285	300	315	330	345
0	7152	7152	7152	7152	7152
5	7080	7118	7081	7139	7108
10	6972	6990	6987	6975	6970
15	6767	6761	6761	6764	6751
20	6464	6499	6441	6497	6468
25	6156	6145	6118	6154	6119
30	5704	5749	5722	5745	5728
35	5259	5264	5252	5283	5269
40	4749	4787	4746	4763	4768
45	4227	4246	4218	4239	4242
50	3670	3698	3673	3693	3696
55	3124	3132	3118	3155	3157
60	2588	2601	2592	2607	2603
65	2087	2086	2066	2087	2070
70	1576	1592	1572	1585	1567
75	1121	1122	1098	1104	1090
80	687	693	665	660	637
85	282	277	251	246	223
90	2.09	1.02	1.10	1.04	2.71
95	1.39	1.40	1.42	1.50	1.52
100	1.79	1.78	1.80	1.80	1.84
105	2.06	2.05	2.01	2.02	2.22
110	2.14	2.13	2.09	2.06	2.29
115	2.19	2.18	2.16	2.22	2.35
120	2.35	2.34	2.36	2.72	2.64
125	2.75	2.67	2.98	3.09	2.76
130	3.34	3.35	3.67	3.55	3.38
135	4.32	4.26	4.25	3.99	3.98
140	4.80	4.89	4.65	4.31	4.23
145	5.32	5.25	5.09	4.60	4.73
150	5.69	5.58	5.43	5.37	5.19
155	5.96	5.78	5.65	6.01	5.63
160	5.84	5.90	6.11	6.22	6.02
165	6.18	6.04	6.07	6.08	5.85
170	6.15	5.87	5.91	5.83	5.68
175	5.73	5.56	5.73	5.80	5.66
180	5.16	5.29	5.32	5.28	5.34

THD and PF Measurement Test Results:

Electrical Measurement:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD(%)
277.0	60	0.5206	137.9	0.9562	11.45

Laboratory: Dongguan New Testing Centre Co., Ltd
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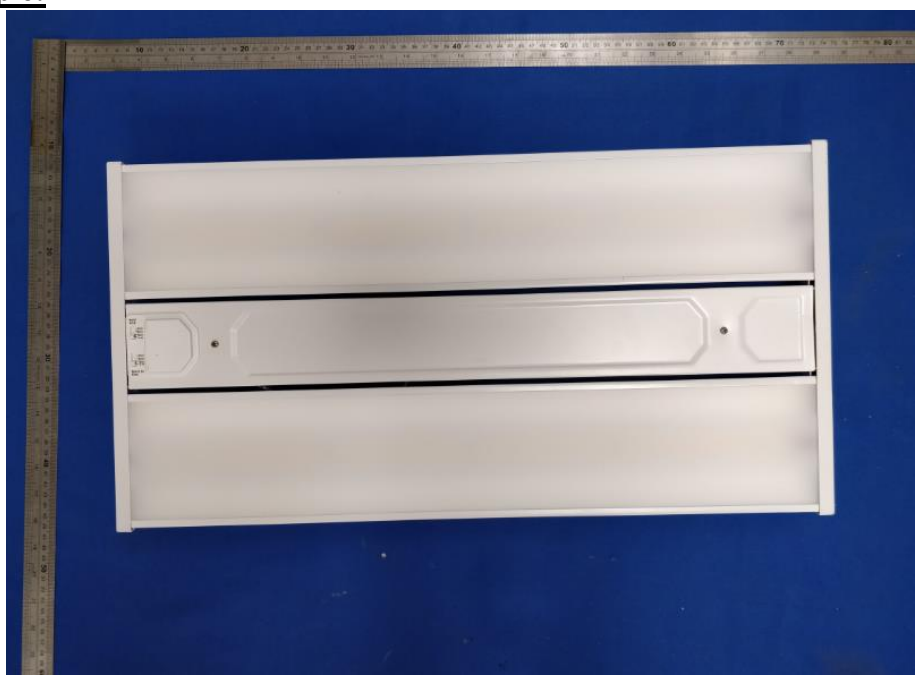
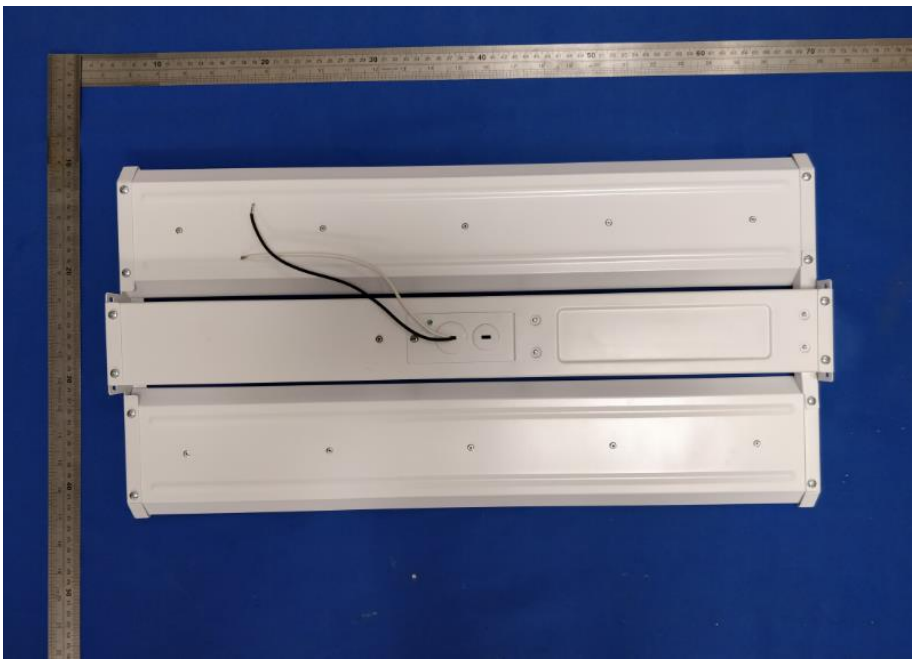
Tel: 86-769-22212079
Website: http://www.ntc-cert.com

Photo of Sample:





Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2018-11-16	2019-11-15
NTC-F01-006	2.0 meter Integrating Sphere	2018-11-16	2019-11-15
NTC-F01-012	Standard Lamp	2018-11-13	2019-11-12
NTC-F01-013	Standard Lamp	2018-11-13	2019-11-12
NTC-F01-031	Digital Power Meter	2018-08-29	2019-08-28
NTC-F01-019	Temperature & Humidity Meter	2018-11-12	2019-11-11

************End of Report************

Laboratory: Dongguan New Testing Centre Co., Ltd
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