



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): 502411##

Representative (Tested) Model: 50241161

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

Prepare by:

Engineer: Derek Lai

Date: 2019-08-20

Derele Lai

Review by:

Technical Lead: Vincent Yuan

Incer Tuen

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:	502411##(##=61-70)
Product Type:	High Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	120-277Vac, 50/60Hz, 180W
Declared CCT:	5000 K
Declared Light Output:	24000 lm
LED Manufacturer:	Samsung
LED Model:	SPMWH1228FD5WARMXX
LED Quantity:	732 pcs
Driver Manufacturer:	ECU ELECTRONICS INDUSTRIAL CO., LTD
Driver Model:	YX-180-1000mA

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:	190723003-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.:	NTCLR19080080
Remark (If applicable):	N/A





Test Specification:			
Date of Test	2019-08-19		
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 Product		
	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 $25 \, ^{\circ}\text{C} \pm 1 \, ^{\circ}\text{C}$, 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.





Report No: NTCLR19080080

Report Version: V1.3

Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.3	41.0	Face Down	90	10

Electrical Data:

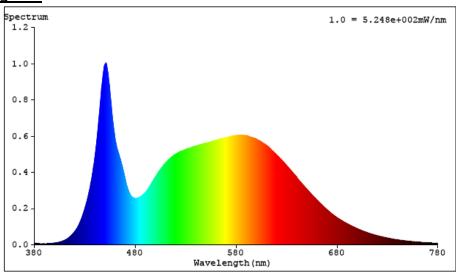
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.510	180.6	0.9964

Color Data:

Parameter	Result
CCT(K)	5087
Ra	85.0
R9	20
Chromaticity, x	0.3427
Chromaticity, y	0.3494
Chromaticity, u'	0.2107
Chromaticity, v'	0.4832
Duv	-0.000161

	Special Color Rendering				
R1	84	R9	20		
R2	89	R10	74		
R3	92	R11	85		
R4	86	R12	67		
R5	85	R13	85		
R6	85	R14	96		
R7	88	R15	80		
R8	71	-	=		

Spectrum Diagram:







Goniophotemeter Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.3	41.0	Face Down	90	25

Electrical Data:

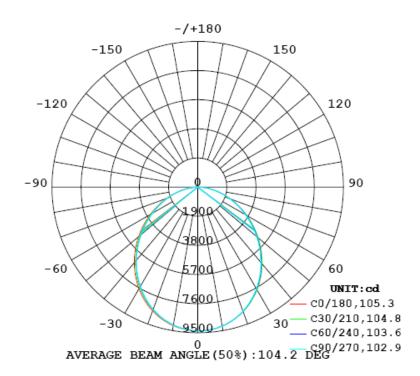
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.510	180.6	0.9964

Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	24660.0
Luminous Efficacy (lm/w)	136.54
Zonal Lumens Distribution (20-50°)	50.9%
Beam Angle (°)	104.2

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM





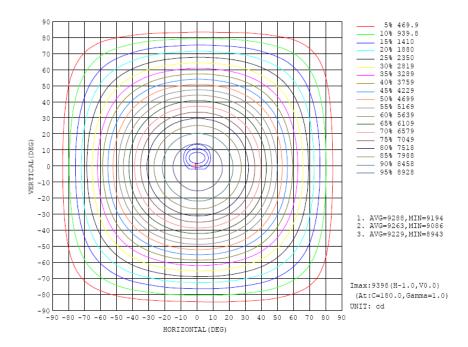


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	• zone	♠ total	%lum, lamp
10	9198	9215	9203	9198	9176	9138	9132	9148	0- 10	885.5	885.5	3.59,3.59
20	8640	8637	8613	8599	8588	8504	8488	8545	10- 20	2516	3401	13.8,13.8
30	7734	7720	7651	7652	7661	7522	7471	7571	20- 30	3747	7149	29,29
40	6523	6509	6398	6420	6437	6272	6208	6335	30- 40	4396	11545	46.8,46.8
50	5143	5114	4995	5012	5035	4876	4808	4946	40- 50	4397	15942	64.6,64.6
60	3679	3675	3569	3573	3570	3441	3388	3513	50- 60	3817	19759	80.1,80.1
70	2256	2286	2214	2197	2161	2071	2065	2143	60- 70	2821	22580	91.6,91.6
80	977.0	1047	996.3	964.0	885.5	851.9	865.7	923.4	70- 80	1628	24209	98.2,98.2
90	51.82	0.5830	0.6195	0.5739	1.492	23.03	1.500	1.723	80- 90	428.7	24638	99.9,99.9
100	1.099	1.011	1.039	1.126	2.437	2.567	2.439	2.492	90-100	2.084	24640	99.9,99.9
110	1.589	1.324	1.509	1.572	2.816	2.780	2.973	2.811	100-110	2.140	24642	99.9,99.9
120	2.319	1.926	2.089	2.322	3.224	3.096	3.150	3.061	110-120	2.414	24644	99.9,99.9
130	3.212	4.275	2.980	4.818	4.382	5.208	4.476	4.889	120-130	3.013	24647	99.9,99.9
140	3.949	4.776	5.718	5.101	5.304	6.471	6.632	6.109	130-140	3.755	24651	100,100
150	4.450	4.787	5.475	5.062	6.261	7.317	7.683	7.168	140-150	3.600	24655	100,100
160	5.267	5.167	4.297	5.622	7.349	8.010	7.523	7.917	150-160	2.859	24657	100,100
170	6.066	5.868	5.519	6.008	7.418	7.985	7.786	7.616	160-170	1.871	24659	100,100
180	6.865	6.861	6.647	6.653	6.887	6.892	6.688	6.667	170-180	0.6406	24660	100,100
DEG	DEG LUMINOUS INTENSITY:cd Less than 35% Percent = 14.0 %									UNI	T:1m	

Isocandela Diagram:







Luminous Distribution Intensity Data:

COLORO 0 15 30 45 60 75 90 100 120 133 150 165 180 195 210 225 240 255 270 0 9378 <th>Table1</th> <th></th> <th>UNI</th> <th>T: cd</th> <th></th> <th></th>	Table1																UNI	T: cd		
0 9378 9378 9378 9378 9378 9378 9378 9378																				
S	y (DEG)		-	-	-	-	-		105	120					-		-		255	270
10						_		_	_		_		_	_	_	_	_	_		-
15										-							-			
20 8640 857 8642 857 8642 857 8629 8621 8623 8621 8623 871 8629 859 8602 859 8607 8597 8588 8551 8525 8546 8492 8770 8888 25 8226 8241 8225 8228 8191 8183 8163 8173 8173 8175 8175 8175 8175 8175 8175 8175 8175																				
25																				
30 7734 7752 7725 7720 7682 7672 7651 7650 7659 7652 7650 7650 7650 7651 7650 7651 7620 7579 7522 7489 7450 7471 35 7156 7184 7155 7149 7101 7082 7048 7056 7043 7063 7077 7081 7076 7033 6983 6932 6872 6853 6850 4561 640 640 640 640 640 640 640 640 640 640																				
35 7156 7184 7159 7149 7101 7082 7048 7056 7043 7063 7077 7082 7076 7033 6983 6982 6887 6853 6867 40 6523 6557 6525 6509 6515 6208 40 6523 6537 6525 6509 6515 6208 40 6523 6537 6525 6509 6515 6208 650 5141 515 500 5141 5141							-									-	_			
40 6523 6557 6525 6509 6451 6427 6398 6400 6399 6420 6430 6441 6437 6388 6339 6272 6226 6195 6208 43 5848 5849 5840 5841 5932 5708 5744 5713 5775 5775 5775 5775 5775 5775 5775																				
45 5840 5890 5811 5332 5760 5740 5714 5713 5707 5722 5742 5754 5752 5702 5852 5869 5844 5501 5512 550 5143 5166 5136 5136 5114 5062 5034 5995 4998 4988 5013 5025 5043 5035 4984 4991 4976 4908 4908 600 3679 5708 4932 4143 4392 4393 4313 4278 4208 4226					7149		7082		7056	7043	7063		7081	7076	7033	6983		6887	6853	6867
50	40	6523	6557	6525	6509	6451	6427	6398	6400	6389	6420	6430	6441	6437	6389	6339	6272	6236	6195	6208
55 4408 4433 4413 4392 4335 4313 4278 4280 4272 4296 4299 4310 4306 4254 4212 4154 4119 4081 4089 60 3679 3708 3682 3675 3626 3692 3569 3569 3569 3573 3570 3580 3570 3580 3570 3572 432 3441 3409 3380 3386 65 2592 356 2990 2966 2963 2962 2962 2976 2679 2674 2659 2679 2679 2679 2796 2796 2796 2796 279	45		5880	5841	5832	5768	5748	5714	5713	5707		_	-	5752	5702	5652	5589	5544		5512
60 3679 3708 3602 3675 3628 3602 3569 3569 3559 3573 3570 3580 3570 3527 3602 341 3409 3380 3380 65 2295 2295 2295 2295 2295 2295 2295 2	50	5143	5166	5136	5114	5062	5034	4995	4998	4988	5012	5025	5043		4984	4941	4876	4834	4796	
65 2956 2990 2968 2967 2926 2926 2910 2879 2874 2859 2857 2851 2851 2851 2782 2742 2721 2890 2706 70 2255 2288 2276 2286 2255 2244 2214 210 2182 2179 2172 2173 2161 210 2110 2071 2072 2073 2073 2075 2075 2075 2075 2075 2075 2075 2075	55	4408	4433	4413	4392	4335	4313	4278	4280	4272	4296	4299	4310	4306	4254	4212	4154	4119	4081	4089
70	60	3679	3708	3682	3675	3628	3602	3569	3569	3556	3573	3570	3580	3570	3527	3492	3441	3409	3380	3388
75 1596 1636 1626 1649 1619 1620 1588 1591 1556 1562 1525 1520 1590 1666 1472 1440 1446 1419 1447 80 977 1014 1019 1047 1025 1039 961 00.0 970 964 919 903 886 893 892 892 892 892 892 892 892 893 8	65	2956	2990	2968	2963	2926	2910	2879	2874	2859	2867	2859	2857	2851	2813	2783	2742	2721	2690	2706
80 977 1014 1019 1047 1025 1030 996 1002 970 964 919 903 886 856 873 852 862 840 866 85 403 444 450 483 467 468 425 376 402 394 351 341 328 300 338 274 321 264 288 90 51.8 0.87 4.31 0.58 0.55 0.56 0.62 0.57 0.62 0.57 0.80 0.58 1.31 328 30 338 274 321 264 288 90 51.8 0.87 4.31 0.58 0.55 0.56 0.62 0.57 0.62 0.57 0.80 0.58 1.31 328 30 338 274 321 264 288 90 51.8 0.87 4.31 0.58 0.55 0.56 0.62 0.57 0.62 0.57 0.80 0.59 1.08 0.50 0.48 0.20 2.06 2.05 1.97 1.93 1.94 1.92 100 1.01 1.03 1.03 1.00 1.01 0.99 1.00 1.04 1.08 1.08 1.13 1.09 1.05 2.44 2.39 2.45 2.57 2.50 1.92 4.9 2.44 105 1.33 1.33 1.42 11.61 1.71 1.21 1.25 1.29 1.32 1.33 1.33 1.31 1.62 1.75 2.81 2.86 2.79 2.85 2.99 2.10 1.05 1.59 1.87 1.35 1.32 1.41 1.45 1.51 1.53 1.53 1.59 1.57 1.59 1.93 2.82 2.99 2.73 2.79 2.85 2.99 2.91 115 1.96 2.08 1.68 1.57 1.62 1.70 1.76 1.80 1.86 1.86 1.87 2.11 2.23 2.91 3.06 2.91 2.86 2.99 2.93 2.99 113 2.92 2.97 2.95 2.97 2.95 2.99 2.93 2.99 2.9	70	2256	2288	2276	2286	2255	2244	2214	2210	2188	2197	2172	2173	2161	2120	2110	2071	2072	2039	2065
85	75	1596	1636	1626	1649	1619	1620	1588	1591	1556	1562	1525	1520	1504	1468	1472	1440	1446	1419	1447
90	80	977	1014	1019	1047	1025	1030	996	1001	970	964	919	903	886	858	873	852	862	840	866
95	85	403	444	450	483	467	468	425	376	402	394	351	341	328	300	338	274	321	264	288
100 1.03 1.03 1.00 1.03 1.00 1.00 1.04 1.05 1.06 1.08 1.13 1.09 1.05 2.44 2.35 2.45 2.57 2.50 2.49 2.44 105 1.33 1.42 1.16 1.77 1.21 1.25 1.29 1.32 1.33 1.33 1.33 1.31 1.66 2.75 2.62 2.99 2.73 2.70 2.70 2.70 2.92 2.91 1.01 1.95 1.97 1.35 1.32 1.41 1.45 1.51 1.57 1.95 1.95 1.95 1.95 1.95 1.95 1.70 1.75 1.95 1.99 2.92 2.99 2.73 2.70 2.07 1.25 2.99 2.95 2.97 1.55 1.96 2.07 2.08 1.68 1.57 1.62 1.70 1.76 1.80 1.86 1.88 2.11 2.23 2.91 3.06 2.81 2.82 2.86 2.94 2.98 1.26 2.32 2.47 3.19 1.93 2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.0	90	51.8	0.87	4.31	0.58	0.55	0.56	0.62	0.55	0.62	0.57	0.48	0.58	1.49	27.2	1.52	23.0	1.52	1.53	1.50
105 1.33 1.42 1.16 1.17 1.21 1.25 1.29 1.32 1.33 1.33 1.31 1.66 2.75 2.81 2.86 2.79 2.85 2.93 2.92 100 1.59 1.87 1.35 1.32 1.41 1.45 1.35 1.53 1.58 1.57 1.59 1.95 2.92 2.99 2.73 2.79 2.85 2.93 2.92 115 1.36 2.81 1.66 1.57 1.62 1.70 1.76 1.85 1.59 1.70 1.76 1.70 1.76 1.80 1.86 1.86 2.81 2.25 2.11 2.23 2.91 3.06 2.81 2.82 2.86 2.94 2.98 120 2.32 2.47 3.19 1.93 2.01 2.03 2.09 2.18 2.26 2.32 3.65 2.60 3.22 3.36 3.64 3.10 3.08 3.11 3.15 125 2.81 2.50 2.32 3.05 3.27 2.81 2.84 2.98 2.99 2.93 3.62 2.89 3.22 3.85 2.60 3.22 3.85 3.64 3.10 3.08 3.11 3.15 135 3.68 3.70 4.14 4.59 4.99 2.98 2.98 3.08 3.08 3.74 3.82 4.19 3.50 4.19 3.50 3.84 3.50 5.21 4.48 4.49 4.80 3.05 3.47 4.82 4.19 3.50 4.89 4.89 5.18 5.58 5.21 4.48 4.49 4.48 135 3.85 3.68 3.70 4.14 4.59 4.99 4.27 3.92 4.43 5.33 5.01 4.40 3.89 4.89 5.18 5.58 6.02 5.96 5.39 5.20 4.40 3.95 4.00 4.29 4.78 5.31 5.74 5.72 5.75 5.55 5.10 4.48 4.18 5.30 5.75 5.59 6.47 6.77 6.70 6.75 6.75 6.75 6.75 6.75 6.75 6.75 6.75	95	0.82	0.84	0.83	0.74	0.75	0.74	0.76	0.75	0.78	0.78	0.91	0.84	2.02	2.06	2.05	1.97	1.93	1.94	1.92
110	100	1.10	1.03	1.00	1.01	0.99	1.00	1.04	1.06	1.08	1.13	1.09	1.05	2.44	2.39	2.45	2.57	2.50	2.49	2.44
115	105	1.33	1.42	1.16	1.17	1.21	1.25	1.29	1.32	1.33	1.33	1.31	1.66	2.75	2.81	2.68	2.79	2.85	2.93	2.92
120 2.32 2.47 3.19 1.93 2.01 2.03 2.09 2.18 2.26 2.32 3.65 2.60 3.22 3.36 3.66 3.10 3.08 3.11 3.15 123 2.01 2.03 3.06 3.07 3.06 3.07 3.06 3.07 3.06 3.07 3.06 3.07 3.06 3.07 3.06 3.07 3.07 3.07 3.07 3.07 3.07 3.07 3.07	110	1.59	1.87	1.35	1.32	1.41	1.45	1.51	1.53	1.58	1.57	1.59	1.93	2.82	2.99	2.73	2.78	2.87	2.95	2.97
125	115	1.96	2.08	1.68	1.57	1.62	1.70	1.76	1.80	1.86	1.88	2.11	2.23	2.91	3.06	2.81	2.81	2.86	2.94	2.98
130 3.21 3.00 3.92 4.28 3.12 2.98 2.98 3.08 3.47 4.82 4.19 3.50 4.38 4.36 5.05 5.21 4.48 4.49 4.48 135 3.60 4.40 3.89 4.89 5.18 5.88 6.02 5.96 5.39 5.20 140 3.89 4.09 4.20 4.20 4.20 4.20 4.20 4.20 4.20 4.20	120	2.32	2.47	3.19	1.93	2.01	2.03	2.09	2.18	2.26	2.32	3.65	2.60	3.22	3.38	3.64	3.10	3.08	3.11	3.15
135 3.68 3.70 4.14 4.59 4.99 4.27 3.92 4.43 5.33 5.01 4.60 3.89 4.89 5.16 5.88 6.02 5.96 5.39 5.20 140 3.95 4.00 4.29 4.78 5.31 5.74 5.72 5.75 5.55 5.10 4.68 4.18 5.30 5.75 5.96 6.47 6.76 6.67 6.63 145 4.20 4.28 3.05 4.79 5.24 5.45 5.53 5.56 6.47 6.75 5.75 5.35 5.14 3.99 4.32 5.75 6.03 5.92 6.91 7.12 7.36 7.40 150 4.45 4.54 5.34 5.34 5.34 5.34 5.34 5.34	125	2.81	2.55	3.57	2.61	2.44	2.40	2.50	2.58	2.69	3.28	3.96	2.73	3.81	3.74	4.39	3.72	3.64	3.66	3.71
140 3.95 4.00 4.28 4.78 5.31 5.74 5.72 5.75 5.55 5.10 4.48 4.10 5.30 5.53 5.96 6.47 6.67 6.67 6.63 145 4.20 4.28 3.65 4.79 5.24 5.64 5.78 5.75 5.53 5.14 3.99 4.32 5.75 6.03 5.92 6.91 7.12 7.36 7.40 150 4.45 4.79 4.88 5.10 4.34 4.71 5.41 5.31 5.49 5.00 4.77 5.48 6.75 6.75 6.75 6.51 7.32 7.50 7.60 7.68 155 4.79 4.88 5.10 4.34 4.71 5.41 5.31 5.49 5.00 4.72 5.22 4.78 6.75 7.02 7.46 7.22 7.75 7.52 7.90 160 5.27 5.29 5.31 5.17 4.51 4.46 4.30 4.72 5.07 5.62 5.41 5.21 7.35 7.40 7.77 8.01 7.61 7.59 7.52 165 5.61 5.61 5.61 5.52 5.89 5.87 5.34 5.48 5.52 5.51 5.91 6.92 6.92 6.92 6.92 6.92 7.92 7.90 7.95 7.92 7.90 170 6.07 6.05 5.95 5.87 5.34 5.48 5.52 5.51 5.91 6.92 6.92 6.92 6.92 6.92 6.92 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.92 7.90 7.90 7.90 7.90 7.90 7.90 7.90 7.90	130	3.21	3.00	3.92	4.28	3.12	2.98	2.98	3.08	3.47	4.82	4.19	3.50	4.38	4.38	5.05	5.21	4.48	4.49	4.48
145	135	3.68	3.70	4.14	4.59	4.99	4.27	3.92	4.43	5.33	5.01	4.40	3.89	4.89	5.18	5.58	6.02	5.96	5.39	5.20
150 4.45 4.54 4.63 4.79 5.00 5.46 5.48 5.51 5.44 5.06 4.77 4.40 6.26 6.52 6.51 7.32 7.50 7.66 7.68 155 4.79 4.86 5.10 4.34 4.11 5.41 5.31 5.49 5.07 4.72 5.72 5.72 5.72 5.72 5.72 5.72 5.72 5	140	3.95	4.00	4.29	4.78	5.31	5.74	5.72	5.75	5.55	5.10	4.48	4.18	5.30	5.53	5.96	6.47	6.67	6.67	6.63
155 4.79 4.88 5.10 4.34 4.71 5.41 5.31 5.49 5.00 4.72 5.22 4.78 6.75 7.02 7.46 7.22 7.75 7.92 7.90 160 5.27 5.29 5.31 5.74 4.51 4.66 4.30 4.72 5.07 5.62 5.41 5.21 7.35 7.40 7.77 8.01 7.51 7.59 7.52 165 5.61 5.66 5.61 5.55 5.29 5.33 5.29 5.35 5.87 5.87 5.88 5.69 5.80 6.07 6.07 6.06 5.95 5.87 5.34 5.48 5.52 5.61 5.91 6.07 6.07 6.06 5.95 5.87 5.34 5.48 5.52 5.61 5.91 6.03 6.03 6.03 6.05 6.07 7.00 7.00 7.00 7.00 7.00 7.00 7.00	145	4.20	4.28	3.85	4.79	5.24	5.64	5.78	5.75	5.53	5.14	3.99	4.32	5.75	6.03	5.92	6.91	7.12	7.36	7.40
160	150	4.45	4.54	4.63	4.79	5.00	5.46	5.48	5.51	5.44	5.06	4.77	4.48	6.26	6.52	6.51	7.32	7.50	7.66	7.68
165	155	4.79	4.88	5.10	4.34	4.71	5.41	5.31	5.49	5.00	4.71	5.22	4.78	6.75	7.02	7.46	7.22	7.75	7.92	7.90
170 6.07 6.06 5.95 5.87 5.34 5.48 5.52 5.61 5.91 6.02 6.07 7.42 7.51 7.78 7.99 7.87 7.62 7.79 175 6.59 6.65 6.54 6.45 6.00 5.96 5.82 5.91 6.23 6.30 6.35 6.47 7.30 7.33 7.36 7.37 7.35 7.17 7.07	160	5.27	5.29	5.31	5.17	4.51	4.46	4.30	4.72	5.07	5.62	5.41	5.21	7.35	7.40	7.77	8.01	7.61	7.59	7.52
175 6.59 6.65 6.54 6.45 6.00 5.96 5.82 5.91 6.23 6.30 6.35 6.47 7.30 7.33 7.36 7.37 7.35 7.17 7.07	165	5.61	5.66	5.61	5.55	5.29	5.33	5.29	5.57	5.87	5.86	5.67	5.62	7.36	7.48	7.84	8.13	8.09	7.96	7.91
	170	6.07	6.06	5.95	5.87	5.34	5.48	5.52	5.61	5.91	6.01	6.02	6.07	7.42	7.51	7.78	7.99	7.87	7.62	7.79
	175	6.59	6.65	6.54	6.45	6.00	5.96	5.82	5.91	6.23	6.30	6.35	6.47	7.30	7.33	7.36	7.37	7.35	7.17	7.07
		6.86	6.98	6.89	6.86	6.70	6.67		_	_		6.71	_	6.89	6.99	6.92	6.89	-	6.72	-

Table2											UNI	T: cd	
C (DEG)													
y (DEG)	285	300	315	330	345								
0	9378	9378	9378	9378	9378								
5	9311	9314	9314	9328	9340								
10	9134	9143	9148	9181	9186								
15	8866	8892	8893	8936	8952								
20	8483	8513	8545	8593	8614								
2.5	8021	8067	8098	8162	8197								
30	7489	7537	7571	7650	7686								
35	6882	6934	6987	7074	7118								
40	6220	6283	6335	6429	6484								
45	5530	5598	5652	5745	5806								
50	4822	4886	4946	5039	5098								
55	4108	4172	4224	4311	4365								
60	3408	3457	3513	3592	3639								
65	2722	2774	2815	2884	2926								
70	2067	2119	2143	2208	2231								
75	1449	1501	1513	1567	1577								
80	878	913	923	961	963								
85	284	335	350	394	395								
90	1.51	1.47	1.72	1.43	45.2								
95	1.92	1.89	1.89	1.96	1.93								
100	2.45	2.42	2.49	2.39	2.33								
105	2.91	2.82	2.76	2.64	2.77								
110	2.94	2.88	2.81	2.67	2.91								
115	2.96	2.89	2.82	2.77	3.00								
120	3.11	3.07	3.06	3.58	3.28								
125	3.63	3.50	3.53	4.10	3.64								
130	4.38	4.23	4.89	4.72	4.36								
135	5.28	5.71	5.58	5.27	4.96								
140	6.43	6.46	6.11	5.67	5.42								
145	7.24	7.01	6.68	5.86	5.96								
150	7.67	7.42	7.17	6.76	6.48								
155	7.96	7.78	7.24	7.50	6.90								
160	7.52	7.54	7.92	7.81	7.43								
165	7.90	7.87	7.95	7.73	7.36								
170	7.70	7.43	7.62	7.51	7.29								
175	7.23	6.96	7.28	7.24	7.23								
180	6.52	6.62	6.67	6.72	6.77								

THD and PF Measurement Test Results:

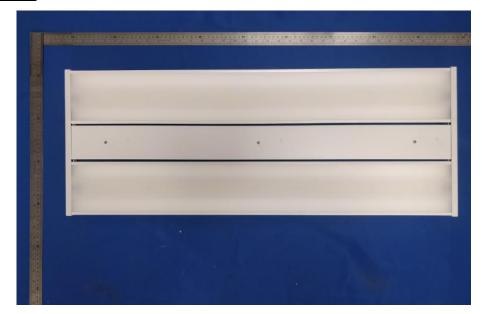
Electrical Measurement:

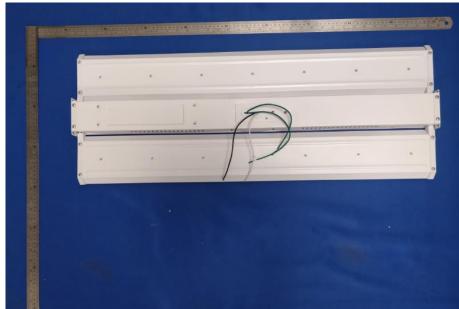
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD(%)
277.0	60	0.6764	180.3	0.9623	16.11





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******