

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

Outdoor-Low Output Wall Pack

Model Name(s):

539011##

Representative (Tested) Model:

53901111

Model Difference: ## can be 11-30 identical to Color Tunable, tunable 3000K, 4000K and 5000K.

Prepare by:

Derek Lai

Engineer: Derek Lai

Date: 2019-12-26

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan

Issue Date: 2020-01-02

Revised Date: N/A

- Note:
1. The results contained in this report pertain only to the tested samples.
 2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd
 3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Client Information:

Applicant Name:	ETI Solid State Lighting (Zhuhai) Ltd
Brand Name:	ETI
Factory 1 Name:	NVC Vietnam Lighting and Technology Co. LTD
Factory 1 Address:	Yen Phong Industrial Park Phase 1, Long Chau Ward, Yen Phong District, Bac Ninh province, Vietnam
Factory 2 Name:	ETI Solid State Lighting (Zhuhai) Ltd
Factory 2 Address:	No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China

Product Information:

Model Number:	539011##(##=11-30)
Product Type:	Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires
Rating Input:	120-277Vac, 50/60Hz, 22W
Declared CCT:	3000K/4000K/5000K
Declared Light Output:	2500 lm
LED Manufacturer:	Samsung Electronics Co., LTD.
LED Model:	SPMWHX228FD5WAW0XX
LED Quantity:	90 pcs

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:	2019-12-17
Quantity of Receipt Samples:	1 pcs
Sample Number:	191217001-S1

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1 st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_zhong@ntc-cert.com

Report Information:

Issued Date of Test Report:	2020-01-02
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR19120117
Remark (If applicable):	N/A

Test Specification:	
Date of Test	2019-12-24
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 8. BUG
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 ANSI C78.77-10-2014 Harmonic Emission Limits – Related Power Quality Requirements Addendum A for IES TM-15-11 Backlight, Uplight, and Glare (BUG) Ratings

Test Methods:
<p>1. Photometric and Electrical Measurements – Light Distribution Method:</p> <p>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° horizontal intervals.</p>
<p>2. Photometric and Electrical Measurements – Integrating Sphere Method:</p> <p>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.</p>
<p>3. THD and PF Measurements:</p> <p>The sample was tested according to the ANSI C82.77-10-2014, 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.</p>

Integrating Sphere Test Results for 3000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.9	41.0	Face Down	90	10

Electrical Data:

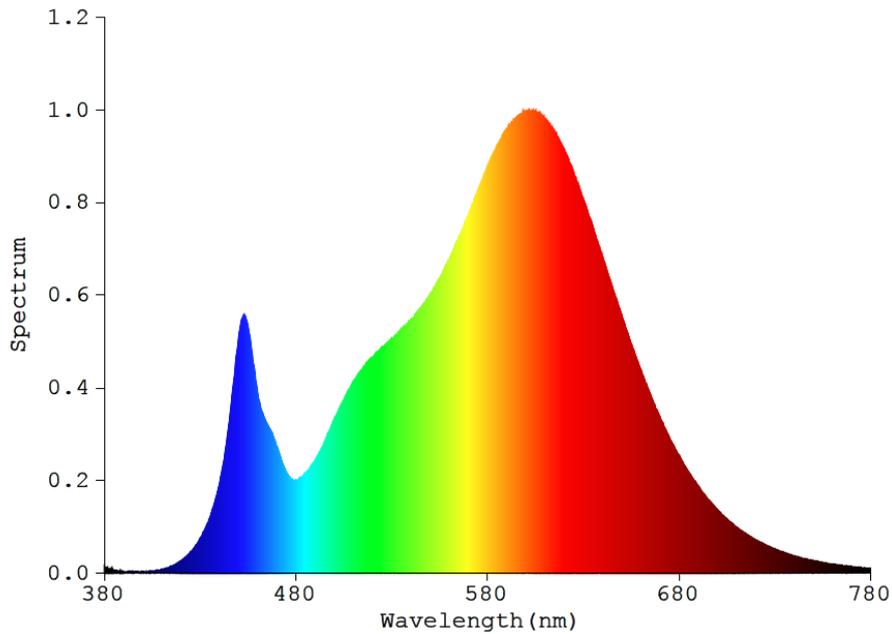
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.1741	20.71	0.9913

Color Data:

Parameter	Result
CCT(K)	3046
Ra	72.3
R9	4
Chromaticity, x	0.4339
Chromaticity, y	0.4034
Chromaticity, u'	0.2489
Chromaticity, v'	0.5207
Duv	0.00015

Special Color Rendering			
R1	81	R9	4
R2	91	R10	81
R3	96	R11	80
R4	80	R12	72
R5	81	R13	83
R6	90	R14	98
R7	82	R15	73
R8	58	-	-

Spectrum Diagram:



Goniophotometer Test Results for 3000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.9	41.0	Face Down	90	25

Electrical Data:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.1741	20.71	0.9913

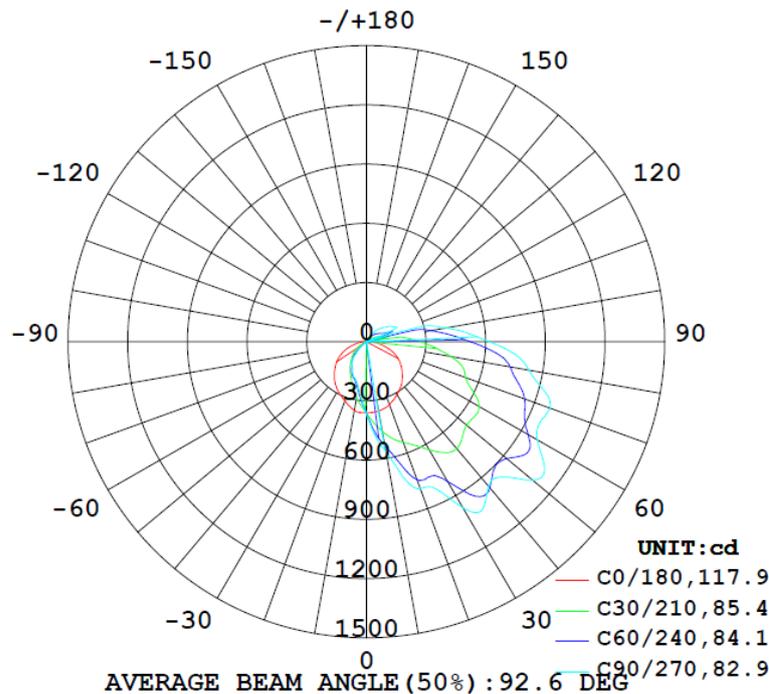
Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	2525.4
Luminous Efficacy (lm/w)	121.94
Zonal Lumens (0-90°) (lm)	2226.2
Zonal Luminous Efficacy (0-90°) (lm/w)	107.49
Zonal Lumens Distribution (80-90°)	11.15%
Beam Angle (°)	92.6
BUG Rating	B0-U3-G3

Note: Zonal Luminous Efficacy (0-90°) and Zonal Lumens Distribution (80-90°) are only calculated with Luminous on 0-90° and total wattage

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

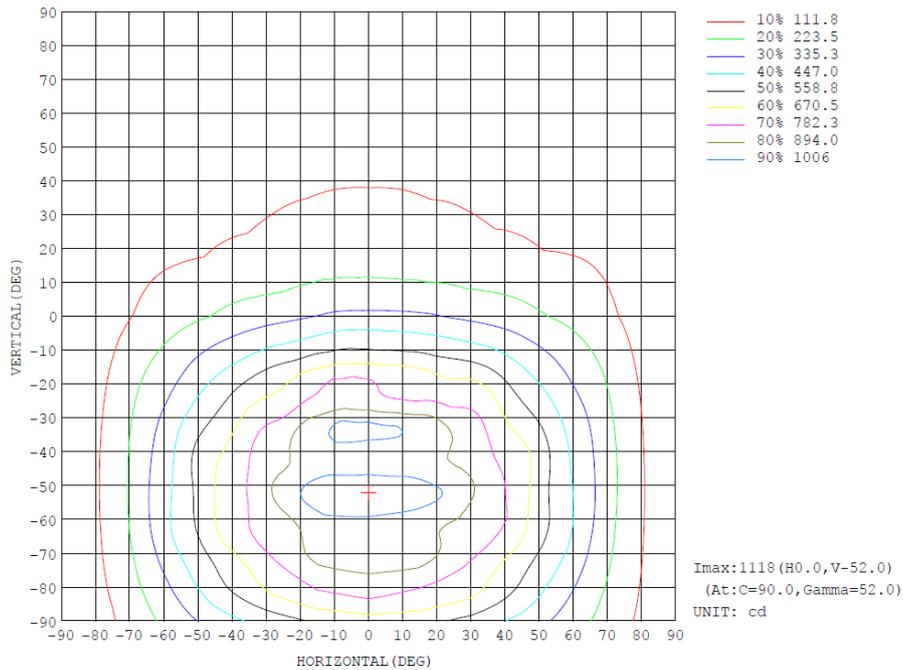


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	356.0	502.6	564.3	511.3	353.3	264.0	236.2	261.0	0- 10	35.77	35.77	1.42,1.42
20	339.4	650.1	789.3	645.4	318.8	198.5	189.2	196.0	10- 20	114.0	149.7	5.93,5.93
30	308.8	735.9	969.7	738.2	287.2	159.4	143.7	157.5	20- 30	196.9	346.6	13.7,13.7
40	276.2	840.0	956.0	777.9	251.3	112.6	92.35	117.8	30- 40	280.5	627.1	24.8,24.8
50	234.7	836.3	1090	810.6	206.7	57.84	16.56	67.06	40- 50	326.3	953.4	37.8,37.8
60	190.8	812.3	991.6	755.7	161.3	5.715	0.4813	10.54	50- 60	359.0	1312	52,52
70	133.4	758.9	983.0	725.7	106.6	0.5081	0.6044	0.4764	60- 70	348.2	1661	65.8,65.8
80	67.82	580.7	829.4	556.2	49.12	0.6799	0.8431	0.6415	70- 80	318.6	1979	78.4,78.4
90	20.84	412.3	618.8	385.6	17.66	0.7412	1.010	0.6757	80- 90	248.8	2228	88.2,88.2
100	1.668	244.3	408.2	188.8	0.4541	0.8877	1.260	0.8083	90-100	157.6	2385	94.5,94.5
110	2.245	146.4	2.323	134.7	2.160	1.085	1.510	1.046	100-110	61.79	2447	96.9,96.9
120	0.2560	76.21	155.0	61.95	0.4501	0.9645	1.312	0.9383	110-120	34.43	2482	98.3,98.3
130	0.2641	39.98	112.2	37.75	0.3780	0.7126	1.126	0.6295	120-130	24.25	2506	99.2,99.2
140	0.2739	17.22	74.00	14.99	0.3557	0.6002	0.9227	0.6012	130-140	13.72	2520	99.8,99.8
150	0.2749	0.1805	19.81	0.2304	0.3699	0.5816	0.6155	0.5980	140-150	5.032	2525	100,100
160	0.3112	0.2137	0.1772	0.3034	0.4218	0.4614	0.5082	0.5465	150-160	0.5559	2525	100,100
170	0.3498	0.3014	0.2493	0.3750	0.4401	0.4054	0.2817	0.4261	160-170	0.1049	2525	100,100
180	0.4054	0.3848	0.3370	0.3770	0.4061	0.3884	0.3420	0.3793	170-180	0.0345	2525	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 17.8 %											UNIT:lm

Isocandela Diagram:



BUG Rating:

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low (0-30)	252.94	10.0
FM - Front-Medium (30-60)	855.81	33.9
FH - Front-High (60-80)	649.21	25.7
FVH - Front-Very High (80-90)	246.69	9.8
Total Forward Light	2299	91.0

BL - Back-Low (0-30)	93.655	3.7
BM - Back-Medium (30-60)	109.98	4.4
BH - Back-High (60-80)	17.531	0.7
BVH - Back-Very High (80-90)	2.0963	0.1
Total Back Light	226.42	9.0

UL - Uplight-Low (90-100)	157.57	6.2
UH - Uplight-High (100-180)	139.93	5.5
Total Up Light	297.5	11.8

Luminous Distribution Intensity Data:

Table--1 UNIT: cd

C (DEG) y (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	361	361	362	360	363	361	364	361	364	362	364	362	361	361	362	360	363	361	364
5	360	383	410	432	454	463	471	464	457	436	414	387	361	340	324	309	301	293	292
10	356	404	460	503	534	552	564	559	546	511	462	403	353	317	288	264	249	237	236
15	350	426	508	567	631	677	706	688	642	568	500	412	337	286	251	225	213	205	202
20	339	443	542	650	743	771	789	803	766	645	528	419	319	255	218	199	194	192	189
25	324	455	579	720	754	783	820	832	801	729	561	427	303	228	191	179	177	168	163
30	309	466	632	736	818	918	970	955	829	738	599	434	287	203	166	159	151	146	144
35	293	475	685	773	955	1016	1026	1044	926	729	624	434	269	181	143	137	128	130	129
40	276	475	707	840	965	962	956	979	955	778	635	428	251	159	120	113	107	98.5	92.4
45	257	462	683	863	909	947	968	957	918	821	632	422	229	136	101	86.2	71.8	56.8	56.3
50	235	446	658	836	920	1049	1090	1060	911	811	618	410	207	114	80.4	57.8	37.7	18.2	16.6
55	213	424	662	818	985	1082	1093	1100	952	779	618	385	184	91.9	58.7	30.8	9.02	0.45	0.39
60	191	396	655	812	938	963	992	997	902	756	618	356	161	71.2	34.9	5.71	0.41	0.48	0.48
65	164	371	590	791	877	917	965	941	841	747	560	332	135	51.7	12.2	0.40	0.51	0.54	0.53
70	133	339	530	759	846	942	983	933	816	726	500	296	107	32.6	2.15	0.51	0.60	0.64	0.60
75	100	286	502	663	787	892	916	878	758	630	467	247	76.7	14.5	1.18	0.60	0.71	0.75	0.73
80	67.8	234	431	581	733	792	829	798	703	556	397	197	49.1	6.54	0.71	0.68	0.80	0.86	0.84
85	39.3	182	346	513	654	716	753	710	616	489	312	148	27.2	4.20	0.57	0.71	0.84	0.89	0.88
90	20.8	131	273	412	524	599	619	577	494	386	242	103	17.7	2.41	0.53	0.74	0.87	0.94	1.01
95	12.6	88.3	210	321	420	495	511	475	394	296	183	69.3	11.5	1.34	0.56	0.73	0.86	0.95	1.05
100	1.67	23.4	47.9	244	329	394	408	378	307	189	82	12.4	0.45	0.69	0.85	0.89	1.06	1.19	1.26
105	4.51	10.4	113	110	124	245	314	247	80.1	11.0	98.9	31.9	4.10	0.80	1.00	1.02	1.15	1.33	1.35
110	2.24	6.97	84.4	146	86.1	6.53	2.32	0.17	32.3	135	73.8	19.7	2.16	0.70	0.98	1.09	1.23	1.39	1.51
115	0.89	3.41	63.5	113	110	120	164	118	97.7	96.7	55.8	9.37	0.99	0.60	0.88	1.04	1.22	1.41	1.58
120	0.26	0.95	46.2	76.2	87.2	107	155	107	82.2	62.0	38.1	3.07	0.45	0.50	0.68	0.96	1.15	1.29	1.31
125	0.23	0.13	27.5	52.5	74.3	97.6	137	101	73.1	47.7	22.7	1.32	0.39	0.49	0.62	0.72	1.07	1.20	1.23
130	0.26	0.20	14.4	40.0	63.9	85.5	112	88.4	62.4	37.7	10.7	0.34	0.38	0.47	0.60	0.71	0.81	1.13	1.13
135	0.27	0.22	5.51	28.1	52.1	74.3	94.5	76.9	51.1	28.2	4.62	0.32	0.37	0.45	0.50	0.73	0.80	0.73	0.80
140	0.27	0.22	0.36	17.2	38.0	58.7	74.0	61.3	37.5	15.0	0.28	0.31	0.36	0.40	0.54	0.60	0.83	0.87	0.92
145	0.27	0.22	0.19	6.21	21.9	38.6	47.3	42.0	20.0	5.08	0.26	0.30	0.36	0.37	0.49	0.59	0.67	0.79	0.82
150	0.27	0.23	0.19	0.18	7.09	13.7	19.8	14.9	6.79	0.23	0.26	0.30	0.37	0.35	0.47	0.58	0.61	0.62	0.62
155	0.29	0.26	0.21	0.17	0.16	2.50	5.57	2.22	0.22	0.26	0.30	0.33	0.39	0.41	0.46	0.52	0.57	0.61	0.58
160	0.31	0.28	0.25	0.21	0.19	0.18	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.45	0.39	0.46	0.48	0.52	0.51
165	0.33	0.31	0.29	0.26	0.24	0.22	0.21	0.25	0.31	0.35	0.38	0.41	0.44	0.45	0.42	0.38	0.40	0.37	0.38
170	0.35	0.34	0.33	0.30	0.27	0.25	0.25	0.28	0.34	0.38	0.41	0.43	0.44	0.45	0.44	0.41	0.32	0.29	0.28
175	0.37	0.37	0.36	0.34	0.32	0.30	0.29	0.31	0.36	0.41	0.43	0.45	0.43	0.43	0.42	0.37	0.33	0.29	0.29
180	0.41	0.41	0.40	0.38	0.37	0.35	0.34	0.33	0.36	0.38	0.39	0.41	0.41	0.42	0.40	0.39	0.37	0.35	0.34

Table--2 UNIT: cd

C (DEG) y (DEG)	285	300	315	330	345															
0	361	364	362	364	362															
5	292	299	307	323	340															
10	236	247	261	287	319															
15	203	210	222	253	296															
20	187	187	196	221	270															
25	164	172	175	194	244															
30	142	148	157	170	220															
35	126	127	139	149	196															
40	99.9	106	118	128	174															
45	59.7	80.2	93.5	108	151															
50	20.5	46.2	67.1	88.3	129															
55	0.75	12.7	39.9	65.8	106															
60	0.47	0.40	10.5	42.8	83.7															
65	0.52	0.51	0.38	21.0	63.2															
70	0.60	0.58	0.48	3.84	43.3															
75	0.72	0.69	0.56	1.36	24.2															
80	0.83	0.77	0.64	0.76	9.40															
85	0.86	0.81	0.67	0.51	5.24															
90	0.91	0.81	0.68	0.50	3.13															
95	0.93	0.81	0.67	0.46	1.66															
100	1.17	1.02	0.81	0.69	0.58															
105	1.31	1.11	0.93	0.88	0.74															
110	1.41	1.18	1.05	0.94	0.69															
115	1.44	1.20	1.02	0.85	0.58															
120	1.29	1.10	0.94	0.69	0.50															
125	1.14	1.04	0.83	0.61	0.47															
130	1.07	0.85	0.63	0.58	0.47															
135	0.72	0.74	0.67	0.48	0.47															
140	0.86	0.74	0.60	0.54	0.46															
145	0.77	0.65	0.57	0.56	0.44															
150	0.57	0.59	0.60	0.55	0.46															
155	0.60	0.61	0.58	0.57	0.55															
160	0.55	0.54	0.55	0.53	0.61															
165	0.40	0.45	0.44	0.56	0.61															
170	0.27	0.31	0.43	0.52	0.54															
175	0.29	0.28	0.37	0.44	0.49															
180	0.33	0.36	0.38	0.39	0.41															

Integrating Sphere Test Results for 5000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.6	41.9	Face Down	90	10

Electrical Data:

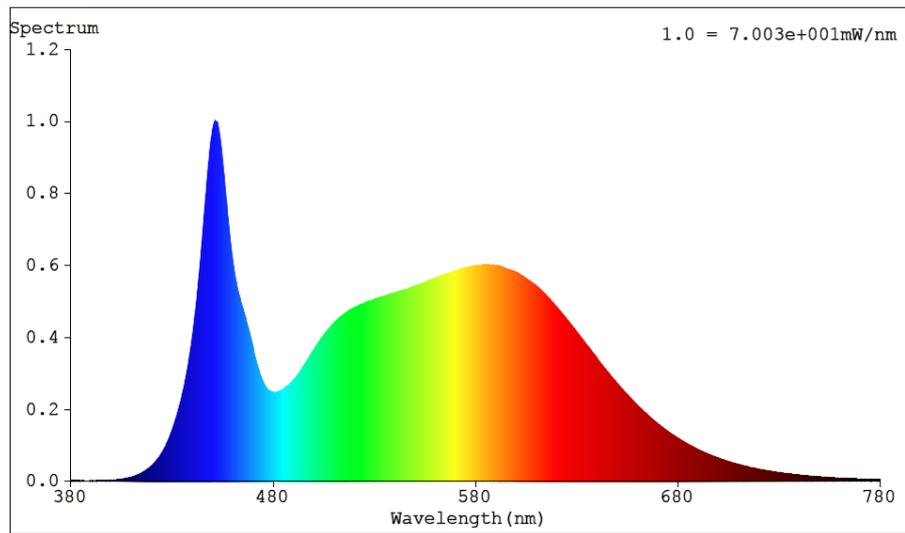
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.1730	20.59	0.9916

Color Data:

Parameter	Result
CCT(K)	5028
Ra	83.8
R9	9
Chromaticity, x	0.3445
Chromaticity, y	0.3526
Chromaticity, u'	0.2106
Chromaticity, v'	0.4851
Duv	0.000768

Special Color Rendering			
R1	82	R9	9
R2	89	R10	74
R3	93	R11	83
R4	84	R12	64
R5	83	R13	84
R6	85	R14	97
R7	86	R15	77
R8	67	-	-

Spectrum Diagram:



Goniophotometer Test Results for 5000K:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.6	41.9	Face Down	90	25

Electrical Data:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.1730	20.59	0.9916

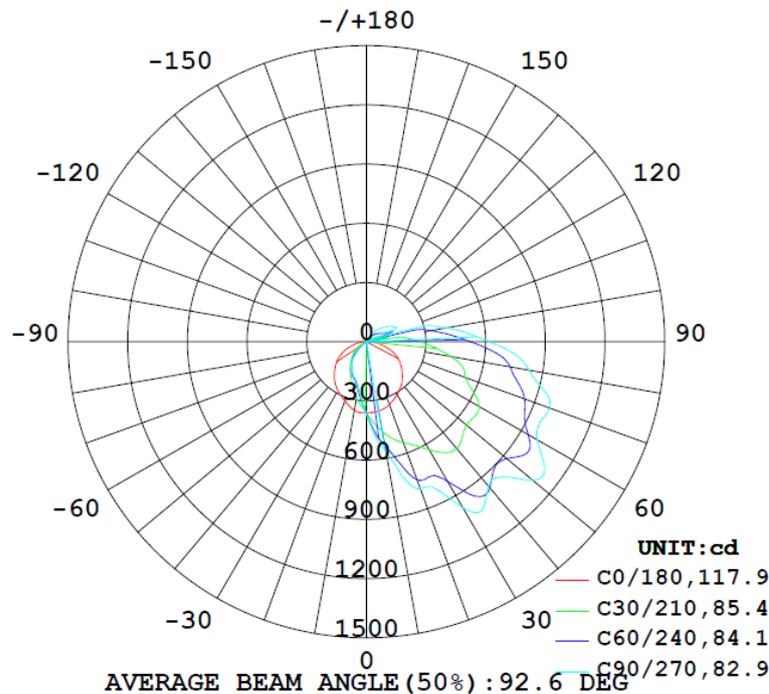
Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	2633.3
Luminous Efficacy (lm/w)	127.89
Zonal Lumens (0-90°) (lm)	2321.3
Zonal Luminous Efficacy (0-90°) (lm/w)	112.74
Zonal Lumens Distribution (80-90°)	11.15%
Beam Angle (°)	92.6
BUG Rating	B0-U3-G3

Note: Zonal Luminous Efficacy (0-90°) and Zonal Lumens Distribution (80-90°) are only calculated with Luminous on 0-90° and total wattage

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

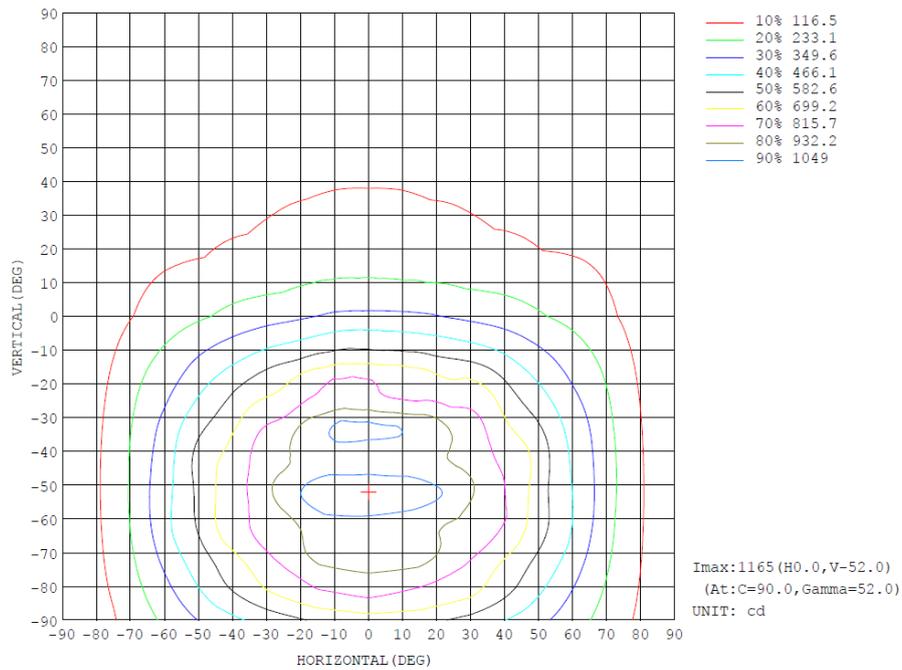


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	φ zone	φ total	lum, lamp
10	371.2	524.1	588.4	533.1	368.4	275.3	246.2	272.1	0- 10	37.30	37.30	1.42,1.42
20	353.9	677.8	823.0	673.0	332.4	207.0	197.2	204.3	10- 20	118.8	156.1	5.93,5.93
30	322.0	767.3	1011	769.7	299.4	166.3	149.8	164.2	20- 30	205.3	361.4	13.7,13.7
40	288.0	875.9	996.9	811.1	262.0	117.4	96.30	122.8	30- 40	292.5	653.9	24.8,24.8
50	244.7	872.0	1136	845.2	215.6	60.31	17.26	69.93	40- 50	340.2	994.1	37.8,37.8
60	198.9	847.0	1034	788.0	168.2	5.959	0.5019	10.99	50- 60	374.4	1368	52,52
70	139.2	791.3	1025	756.7	111.1	0.5299	0.6302	0.4968	60- 70	363.0	1731	65.8,65.8
80	70.71	605.5	864.8	579.9	51.21	0.7089	0.8791	0.6689	70- 80	332.2	2064	78.4,78.4
90	21.73	429.9	645.3	402.1	18.41	0.7728	1.053	0.7046	80- 90	259.4	2323	88.2,88.2
100	1.740	254.7	425.7	196.8	0.4735	0.9256	1.314	0.8428	90-100	164.3	2487	94.5,94.5
110	2.341	152.7	2.422	140.4	2.252	1.131	1.575	1.091	100-110	64.43	2552	96.9,96.9
120	0.2669	79.46	161.6	64.60	0.4693	1.006	1.368	0.9784	110-120	35.90	2588	98.3,98.3
130	0.2753	41.69	117.0	39.36	0.3941	0.7430	1.174	0.6564	120-130	25.29	2613	99.2,99.2
140	0.2856	17.95	77.16	15.63	0.3709	0.6258	0.9621	0.6269	130-140	14.31	2627	99.8,99.8
150	0.2866	0.1882	20.66	0.2403	0.3857	0.6064	0.6418	0.6236	140-150	5.247	2633	100,100
160	0.3245	0.2228	0.1848	0.3164	0.4398	0.4811	0.5299	0.5699	150-160	0.5796	2633	100,100
170	0.3647	0.3143	0.2600	0.3910	0.4589	0.4227	0.2937	0.4443	160-170	0.1094	2633	100,100
180	0.4227	0.4013	0.3514	0.3931	0.4234	0.4050	0.3566	0.3955	170-180	0.0360	2633	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 17.8 %									UNIT:lm		

Isocandela Diagram:



BUG Rating:

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low (0-30)	263.75	10.0
FM - Front-Medium (30-60)	892.37	33.9
FH - Front-High (60-80)	676.95	25.7
FVH - Front-Very High (80-90)	257.22	9.8
Total Forward Light	2397.2	91.0
BL - Back-Low (0-30)	97.655	3.7
BM - Back-Medium (30-60)	114.68	4.4
BH - Back-High (60-80)	18.28	0.7
BVH - Back-Very High (80-90)	2.1858	0.1
Total Back Light	236.09	9.0
UL - Uplight-Low (90-100)	164.31	6.2
UH - Uplight-High (100-180)	145.9	5.5
Total Up Light	310.21	11.8

Luminous Distribution Intensity Data:

Table--1 UNIT: cd

C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	376	376	377	376	378	376	380	377	380	377	379	378	376	376	377	376	378	376	380
5	376	400	427	450	473	483	491	484	477	455	432	403	376	355	338	322	314	305	304
10	371	422	480	524	557	576	588	583	570	533	482	421	368	330	301	275	259	248	246
15	365	444	529	591	658	706	737	717	669	592	521	430	351	298	262	234	222	214	211
20	354	462	565	678	775	804	823	837	798	673	551	437	332	266	227	207	202	201	197
25	338	475	604	750	886	917	956	967	835	760	685	585	445	316	238	199	186	184	175
30	322	486	659	867	1081	1111	1151	1162	864	770	684	582	442	299	211	173	166	157	150
35	306	495	714	966	1242	1272	1312	1323	866	760	650	522	381	248	160	122	115	106	100
40	288	496	737	1007	1303	1333	1373	1384	811	662	522	381	248	160	122	115	106	100	96.3
45	267	482	712	900	1188	1218	1258	1269	657	486	322	203	124	85.9	59.9	45.3	40.7	39.3	38.7
50	245	465	686	872	1093	1123	1163	1174	550	385	223	134	74.2	53.9	39.3	32.1	29.7	29.0	28.3
55	222	442	691	853	1027	1057	1097	1108	401	264	155	96.9	61.2	42.1	32.1	26.4	25.7	25.0	24.3
60	199	413	683	847	978	1004	1034	1039	264	155	96.9	61.2	42.1	32.1	26.4	25.7	25.0	24.3	23.6
65	171	387	615	825	915	956	1006	1017	111	77.9	58.4	34.6	14.1	54.0	12.7	0.42	0.54	0.57	0.55
70	139	353	553	791	882	983	1025	1025	851	757	521	309	111	34.0	2.24	0.53	0.62	0.66	0.63
75	105	298	524	692	821	930	956	916	790	657	487	257	79.9	15.1	1.23	0.62	0.74	0.78	0.76
80	70.7	244	450	606	764	826	865	832	733	580	414	205	51.2	6.82	0.74	0.71	0.83	0.90	0.88
85	41.0	190	361	535	682	747	785	741	642	509	325	155	28.4	4.38	0.60	0.74	0.87	0.93	0.92
90	21.7	137	285	430	546	625	645	601	515	402	252	108	18.4	2.51	0.56	0.77	0.90	0.98	1.05
95	13.1	92.1	219	334	438	517	533	495	411	308	191	72.3	12.0	1.40	0.58	0.76	0.89	0.99	1.09
100	1.74	24.4	49.9	255	343	411	426	394	320	197	0.86	12.9	0.47	0.72	0.89	0.93	1.10	1.25	1.31
105	4.71	10.8	118	115	130	256	327	257	83.6	11.4	103	33.3	4.28	0.83	1.05	1.07	1.20	1.38	1.40
110	2.34	7.27	88.0	153	89.8	6.81	2.42	0.18	33.6	140	76.9	20.5	2.25	0.73	1.03	1.13	1.28	1.45	1.57
115	0.93	3.56	66.2	118	115	125	171	123	102	101	58.2	9.77	1.03	0.62	0.92	1.09	1.27	1.47	1.65
120	0.27	0.99	48.1	79.5	90.9	111	162	112	85.7	64.6	39.7	3.20	0.47	0.52	0.71	1.01	1.20	1.35	1.37
125	0.24	0.14	28.7	54.7	77.5	102	143	105	76.2	49.8	23.6	1.38	0.41	0.51	0.65	0.75	1.12	1.25	1.28
130	0.28	0.20	15.0	41.7	66.6	89.2	117	92.2	65.0	39.4	11.2	0.35	0.39	0.49	0.63	0.74	0.84	1.18	1.17
135	0.28	0.22	5.75	29.3	54.3	77.4	98.5	80.2	53.3	29.4	4.82	0.34	0.38	0.47	0.52	0.76	0.84	0.76	0.83
140	0.29	0.23	0.37	18.0	39.6	61.2	77.2	64.0	39.1	15.6	0.29	0.32	0.37	0.42	0.57	0.63	0.87	0.90	0.86
145	0.28	0.23	0.20	6.47	22.9	40.2	49.3	43.8	20.8	5.29	0.27	0.31	0.37	0.38	0.51	0.61	0.70	0.82	0.95
150	0.29	0.24	0.20	0.19	7.39	14.3	20.7	15.6	7.08	0.24	0.27	0.31	0.39	0.36	0.49	0.61	0.64	0.64	0.64
155	0.30	0.27	0.22	0.18	0.17	2.61	5.81	2.32	0.23	0.27	0.31	0.34	0.41	0.43	0.48	0.54	0.59	0.63	0.61
160	0.32	0.29	0.26	0.22	0.20	0.19	0.18	0.22	0.27	0.32	0.35	0.39	0.44	0.47	0.40	0.48	0.50	0.54	0.53
165	0.34	0.33	0.30	0.27	0.25	0.23	0.22	0.26	0.32	0.36	0.39	0.43	0.46	0.47	0.44	0.40	0.42	0.39	0.39
170	0.36	0.36	0.34	0.31	0.28	0.26	0.26	0.29	0.35	0.39	0.43	0.45	0.46	0.47	0.46	0.42	0.34	0.30	0.29
175	0.39	0.39	0.38	0.36	0.33	0.31	0.31	0.32	0.38	0.42	0.45	0.47	0.45	0.45	0.44	0.39	0.34	0.30	0.30
180	0.42	0.43	0.42	0.40	0.38	0.36	0.35	0.34	0.37	0.39	0.40	0.43	0.42	0.43	0.42	0.41	0.38	0.37	0.36

Table--2 UNIT: cd

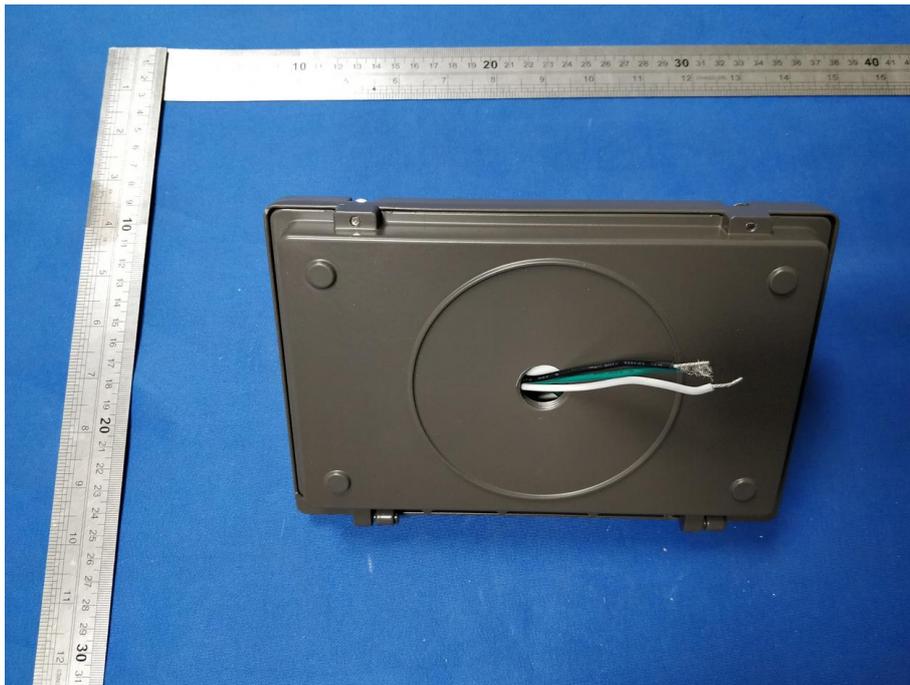
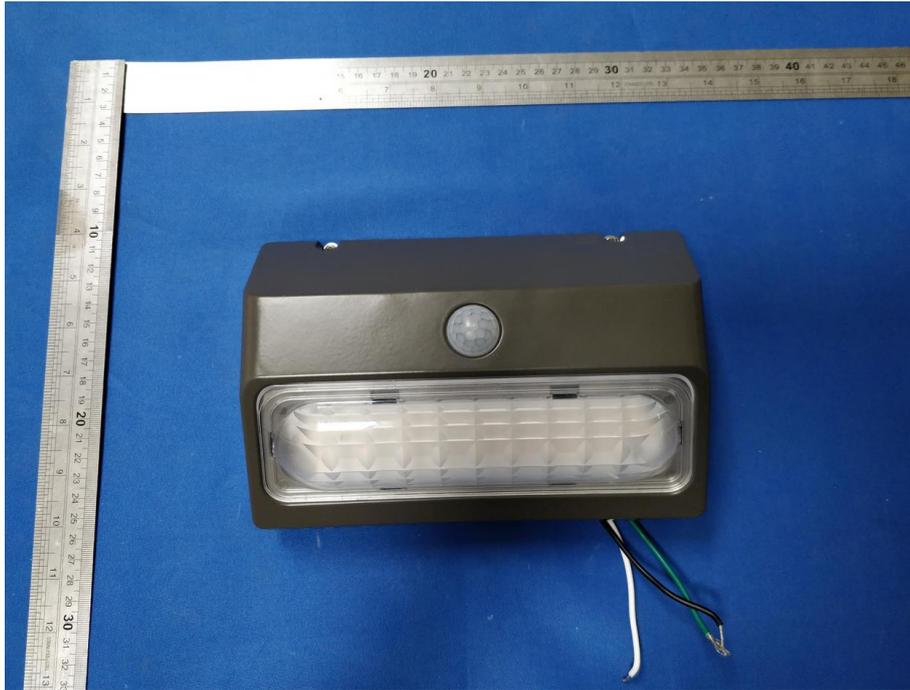
C (DEG)	285	300	315	330	345														
0	377	380	377	379	378														
5	304	312	321	337	355														
10	246	257	272	300	332														
15	211	219	232	264	308														
20	195	195	204	230	282														
25	171	179	182	202	255														
30	148	155	164	178	229														
35	131	132	145	156	204														
40	104	111	123	134	181														
45	62.2	83.6	97.5	113	158														
50	21.4	48.2	69.9	92.1	134														
55	0.78	13.2	41.6	68.6	111														
60	0.49	0.42	11.0	44.6	87.2														
65	0.55	0.53	0.40	21.8	65.9														
70	0.62	0.61	0.50	4.00	45.1														
75	0.75	0.72	0.58	1.42	25.2														
80	0.86	0.81	0.67	0.80	9.80														
85	0.90	0.84	0.70	0.53	5.46														
90	0.95	0.85	0.70	0.52	3.27														
95	0.97	0.84	0.69	0.48	1.73														
100	1.22	1.07	0.84	0.72	0.61														
105	1.36	1.15	0.97	0.91	0.77														
110	1.47	1.23	1.09	0.98	0.72														
115	1.50	1.25	1.07	0.89	0.60														
120	1.35	1.15	0.98	0.72	0.52														
125	1.19	1.09	0.87	0.63	0.49														
130	1.12	0.89	0.66	0.60	0.49														
135	0.75	0.77	0.70	0.50	0.50														
140	0.89	0.77	0.63	0.56	0.48														
145	0.80	0.68	0.59	0.59	0.46														
150	0.59	0.61	0.62	0.58	0.48														
155	0.63	0.64	0.61	0.59	0.58														
160	0.57	0.57	0.57	0.55	0.63														
165	0.42	0.46	0.45	0.58	0.63														
170	0.29	0.32	0.44	0.54	0.57														
175	0.30	0.29	0.39	0.46	0.51														
180	0.35	0.37	0.40	0.41	0.43														

THD and PF Measurement Test Results:

Electrical Measurement:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD (%)
277.0	60	0.07753	20.51	0.9550	14.73

Photo of Sample:



Annex:

ANSI CCT Quadrangle (omit any outside product range)/Worst-Case Value	Actual CCT (K)	Power Consumption (W)	Lumen Output (lm)	Efficacy (lm/W)	Input Control Signal Applied
3000K	3046	20.71	2525.4	121.94	Set Switch 0% to 3000K
4000K	3867	19.98	2731.0	136.69	Set Switch 50% to 4000K
5000K	5028	20.51	2633.3	127.89	Set Switch 100% to 5000K
Lowest Efficacy	121.94 lm/W @3000K				
Maximum Power	20.71 W				

Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2019-11-13	2020-11-12
NTC-F01-006	2.0 meter Integrating Sphere	2019-11-13	2020-11-12
NTC-F01-012	Standard Lamp	2019-11-13	2020-11-12
NTC-F01-013	Standard Lamp	2019-11-13	2020-11-12
NTC-F01-031	Digital Power Meter	2019-08-22	2020-08-21
NTC-F01-019	Temperature & Humidity Meter	2019-11-15	2020-11-14

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