

LM-79-08 Test Report

For

ATG Electronics

(Brand Name: ATG Electronics)

10588 Monte Vista Ave, Montclair, CA 91763

Outdoor Full-Cutoff Wall-Mounted Area Luminaires

Model name(s): WPGP-28-XX

Remark: "XX" refer to CCT as below:40=4000,50=5000,57=5700

Representative (Tested) Model: WPGP-28-40
WPGP-28-57

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Jun.26,2019

Review By:

Johnson Sun

Manager: Johnson Sun

Note: 1.The results contained in this report pertain only to the tested samples.

2.This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.

1.1 Product Information:

Organization Name	ATG Electronics	
Brand Name	ATG Electronics	
Model Number	WPGP-28-XX	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Full-Cutoff Wall-Mounted Area Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60Hz	
Nominal Power	28W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K,5700K	
LED Manufacturer	LUXEON	
LED Model	LUXEON 3030 2D	
Sample Number	JAE190427-QA1(4000K),QA2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


1.2 Test Specifications:

Date of Receipt	Apr.27,2019
Date of Test	Apr.28,2019
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems

1.3 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer 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 120 or rated 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° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

2.1 Electrical, Photometric and Chromaticity Measurements

Test date	2019-04-28	Test Ambient:	25.1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	WPGP-28-40	Total Operating Time (min)	90

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE190427-QA1	120.0	60	0.2329	27.71	0.9916	9.09
	277.0	60	0.1090	28.13	0.9320	8.33
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

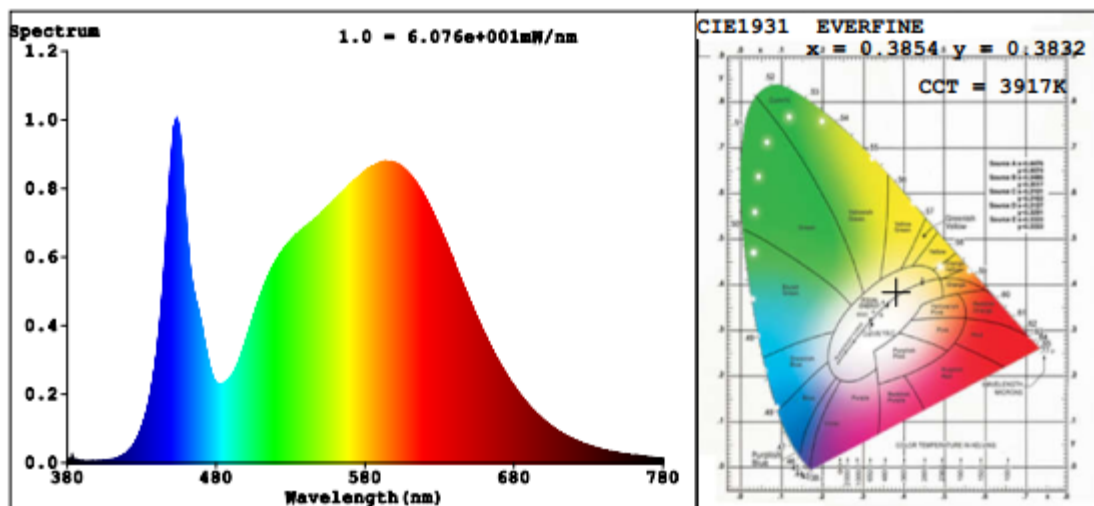
Chromaticity Measurement - Sphere-Spectroradiometer
Method(Self-absorption:1.1732):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	10
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	3917	R3	94	R11	79
Duv	0.0016	R4	81	R12	56
Chromaticity (x, y)	x=0.3854 y=0.3832	R5	80	R13	83
Chromaticity (u', v')	u'=0.2258 v'=0.5051	R6	83	R14	96
Color Rendering Index (CRI)	82.3	R7	87	R15	75
R9	10	R8	65	--	--

Photometric Measurement – Goniophotometer Method(Test Distance: 26.000m):

Parameter	Result		DLC V4.4 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3598.0	3604.0	$\geq 300(-10\%)$	
Luminous Efficacy (lm/W)	129.84	128.12	Standard: $\geq 90(-3\%)$	Premium: $\geq 110(-3\%)$
Zonal lumens in the 0-90° zone (%)	99.7	--	$\geq 100(-3)$	
Zonal lumens in the 80-90° zone (%)	1.0	--	$\leq 10(+3)$	
Beam Angle (°)	87.8	--	--	
Center Beam Candle Power (cd)	1246	--	--	

Spectral Power Distribution & Chromaticity Diagram

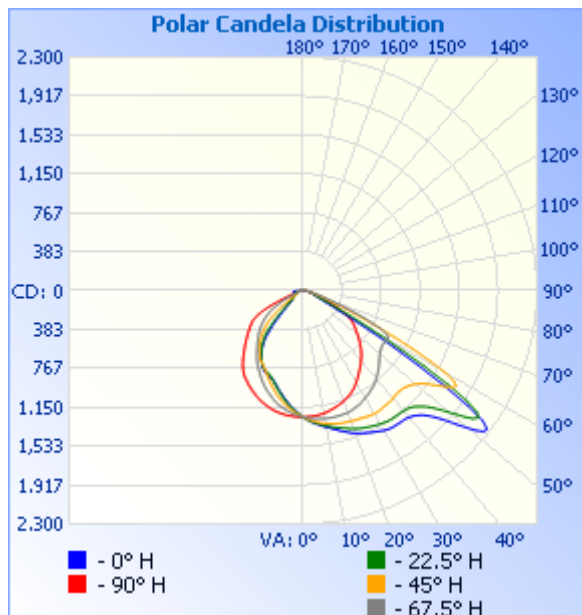


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	986.5	27.4%
0-40	1,653.4	46%
0-60	3,127.9	86.9%
60-90	459.0	12.8%
70-100	132.4	3.7%
90-120	3.2	0.1%
0-90	3,586.9	99.7%
90-180	10.6	0.3%
0-180	3,597.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	117.8	3.3%	90-100	1.2	0%
10-20	339.0	9.4%	100-110	0.7	0%
20-30	529.8	14.7%	110-120	1.3	0%
30-40	666.9	18.5%	120-130	1.7	0%
40-50	722.2	20.1%	130-140	1.8	0.1%
50-60	752.2	20.9%	140-150	1.5	0%
60-70	327.8	9.1%	150-160	1.2	0%
70-80	96.5	2.7%	160-170	0.8	0%
80-90	34.7	1.0%	170-180	0.3	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
3.3ft	114.4 fc	4.2 ft	5.6 ft
6.6ft	28.6 fc	8.4 ft	11.2 ft
9.9ft	12.7 fc	12.6 ft	16.8 ft
13.2ft	7.1 fc	16.7 ft	22.4 ft
16.5ft	4.6 fc	20.9 ft	28.0 ft
19.8ft	3.2 fc	25.1 ft	33.6 ft

■ Vert. Spread: 64.8°
■ Horiz. Spread: 80.6°

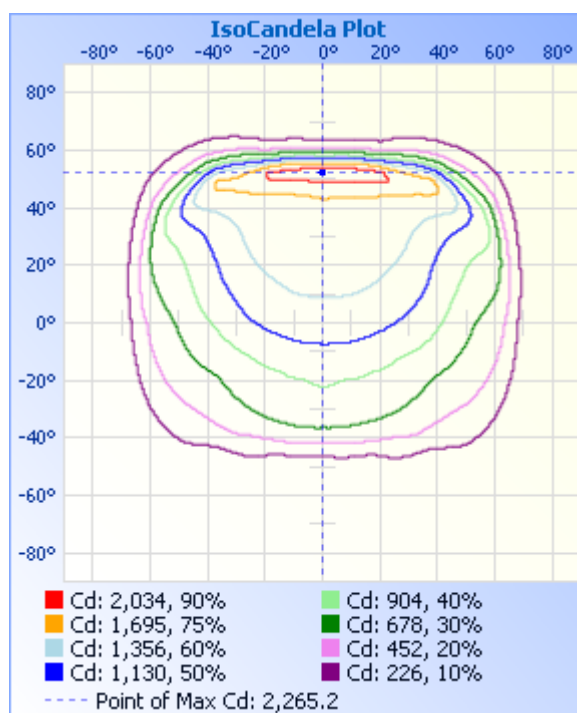
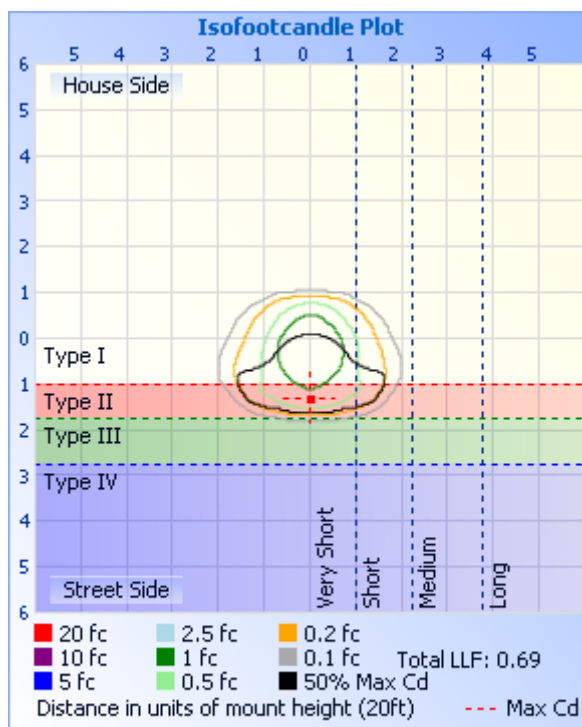


Table--1

UNIT: cd

C (DEG) Y (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	
0	1246	1246	1246	1246	1246	1246	1246	1246	1246	1246	1246	1246	1246	1246	1246	1246	
5	1241	1274	1292	1309	1312	1307	1294	1266	1240	1212	1185	1170	1165	1170	1186	1214	
10	1230	1292	1329	1357	1367	1354	1331	1279	1223	1166	1117	1078	1072	1083	1120	1171	
15	1206	1297	1359	1410	1430	1398	1355	1282	1195	1105	1035	985	982	990	1040	1114	
20	1169	1290	1382	1466	1496	1448	1369	1278	1160	1034	943	906	915	909	956	1043	
25	1124	1273	1401	1510	1543	1485	1384	1257	1113	947	861	872	885	871	875	966	
30	1071	1240	1408	1539	1591	1516	1400	1220	1042	862	807	816	817	812	816	883	
35	1012	1205	1419	1565	1610	1536	1392	1177	962	771	743	719	708	717	751	793	
40	922	1146	1411	1573	1626	1543	1380	1122	886	683	642	581	523	584	659	703	
45	817	1077	1411	1652	1744	1612	1372	1055	803	606	528	334	255	344	546	621	
50	723	1020	1482	1908	2102	1858	1433	982	708	531	366	156	150	157	391	540	
55	643	997	1716	2159	1978	2091	1634	947	619	424	163	120	126	119	179	447	
60	558	1039	1674	847	577	868	1611	959	510	289	97.6	104	113	102	99.0	320	
65	362	842	632	226	180	239	666	746	309	157	77.5	91.3	99.9	89.0	77.9	177	
70	145	346	233	131	128	131	254	318	133	73.6	62.0	76.1	87.3	74.0	61.8	79.9	
75	76.0	150	116	97.9	98.7	96.8	125	143	75.3	47.5	48.8	71.4	91.7	68.1	48.1	48.6	
80	44.6	77.2	74.5	64.3	60.9	63.9	77.0	75.2	43.9	31.3	38.6	54.0	66.4	51.5	37.1	32.1	
85	21.9	38.7	36.9	31.0	28.1	30.5	36.9	37.9	21.1	23.9	31.9	37.7	48.1	34.7	28.6	23.5	
90	0.77	1.49	1.53	1.58	2.00	2.29	2.52	2.03	0.34	0.68	0.54	0.45	0.69	11.1	0.50	12.7	
95	0.38	0.45	0.35	0.40	0.45	0.35	0.45	0.45	0.34	0.52	0.48	0.30	0.41	6.22	0.45	3.07	
100	0.34	0.30	0.31	0.23	0.26	0.31	0.28	0.33	0.44	0.84	0.75	0.41	0.40	2.00	0.65	0.80	
105	0.63	0.30	0.20	0.18	0.25	0.28	0.19	0.34	0.73	1.33	1.50	0.75	0.50	0.74	1.41	1.34	
110	0.98	0.34	0.22	0.22	0.26	0.25	0.21	0.59	1.03	1.73	2.09	1.55	1.25	1.48	2.00	1.65	
115	1.37	0.68	0.24	0.25	0.28	0.20	0.24	0.82	1.33	1.96	2.54	2.05	2.06	2.07	2.30	1.94	
120	1.52	0.89	0.45	0.28	0.29	0.20	0.60	0.99	1.57	2.34	2.81	2.86	2.81	2.82	2.61	2.09	
125	1.87	1.14	0.77	0.55	0.30	0.54	0.85	1.29	1.72	2.46	3.09	3.41	2.22	3.26	2.95	2.38	
130	2.31	1.53	0.87	0.83	0.85	0.99	0.95	1.48	2.04	2.49	3.14	4.16	4.36	3.97	3.16	2.44	
135	2.38	1.60	1.00	1.05	0.97	1.28	1.10	1.54	2.20	2.62	3.09	4.22	4.51	4.04	3.10	2.57	
140	2.42	1.75	1.15	1.30	1.30	1.43	1.32	2.24	2.36	2.68	2.89	3.91	4.11	3.90	2.89	2.73	
145	2.45	1.81	1.59	1.60	1.55	1.63	1.40	2.28	2.31	2.68	2.87	3.51	3.81	3.48	3.05	2.83	
150	2.46	1.86	2.09	1.85	1.86	1.93	1.85	2.29	2.31	2.69	3.04	3.31	3.65	3.24	3.50	2.90	
155	2.47	2.27	2.49	2.40	2.25	2.27	2.30	2.53	2.31	2.70	3.12	3.22	3.30	3.16	3.39	2.98	
160	2.42	2.35	2.62	2.48	2.37	2.37	2.65	2.69	2.46	2.71	3.02	3.22	3.20	3.08	3.24	3.07	
165	2.52	2.57	2.79	2.57	2.54	2.68	2.86	2.82	2.75	2.72	3.03	3.29	3.11	3.15	3.31	3.15	
170	2.65	3.06	3.34	3.00	2.85	3.06	3.30	2.95	2.95	2.97	3.40	4.05	3.86	4.15	3.90	3.83	
175	2.95	3.16	3.59	3.25	3.65	3.41	3.60	3.08	2.99	3.07	3.54	3.91	3.96	4.10	3.83	3.86	
180	2.95	3.26	3.74	3.81	3.86	3.66	3.70	3.08	2.80	2.97	3.29	3.76	3.71	3.85	3.75	3.68	

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2019-04-28	Test Ambient:	25.1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	WPGP-28-57	Total Operating Time (min)	90

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JAE190427-QA2	120.0	60	0.2316	27.52	0.9901	9.43
	277.0	60	0.1083	27.86	0.9289	8.84
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer

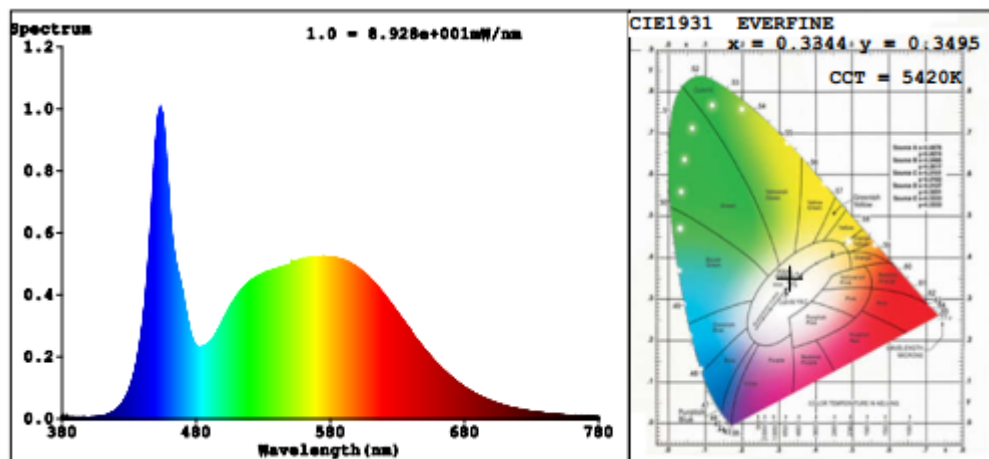
Method(Self-absorption:1.1728):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	5
Frequency (Hz)	60	R2	89	R10	72
CCT (K)	5420	R3	93	R11	80
Duv	0.0034	R4	81	R12	57
Chromaticity (x, y)	x=0.3344 y=0.3495	R5	81	R13	83
Chromaticity (u', v')	u'=0.2050 v'=0.4821	R6	83	R14	96
Color Rendering Index (CRI)	82.7	R7	87	R15	76
R9	5	R8	67	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.4 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3629	3635	>=300(-10%)	
Luminous Efficacy (lm/W)	131.87	130.47	Standard: >= 90(-3%)	Premium: >= 110(-3%)

Spectral Power Distribution & Chromaticity Diagram



2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
WPGP-28-40	4000K	3598.0	27.71	129.84
WPGP-28-50	5000K	3619 ^{*1}	27.62 ^{*2}	131.03 ^{*3}
WPGP-28-57	5700K	3629	27.52	131.87

*1: This value is calculated and the calculation formula is as below:

$$3619 = (3629 - 3598.0) / 3 * 2 + 3598.0$$

*2: This value is calculated and the calculation formula is as below:

$$27.62 = (27.71 + 27.52) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$131.03 = (3619 / 27.62)$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-423	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-327	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-332	Standard Lamp	2018-07-04	2019-07-03
ST-R-333	Power Meter for Integrating Sphere	2018-06-28	2019-06-27
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2018-07-04	2019-07-03
ST-R-358	Power Meter for Goniophotometer	2018-06-28	2019-06-27
Expand Uncertainty: Photometric Measurement (Sphere):2.66%, k=2 Chromaticity Measurement(Sphere):28.6K, k=2 Photometric Measurement(Goniophotometer):2.76%, k=2			

******* END OF REPORT *******