



8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Report No: L061702601



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Issue Date: 6/9/2017

Report Prepared For: Revolution Lighting Technologies (RVLT)
2280 Ward Ave. Docks 5&6, Simi Valley, CA 93065

Model Number: 204220-013

Test: Electrical and Photometric tests

Standards Used: Appropriate part or all test guidelines were used for test performed:
IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products
ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Testing Condition: GE ULTRAMAX GE232MAXP-N/ULTRA driver was connected to two led tubes from the driver output. Photometric measurements were measured from a single led tube while the other lamp was powered and covered with black velvet to prevent any light pollution. Input power of single measured module is calculated from the total power divided by two.

Sample Arrival Date: 6/8/17

Date of Tests: 6/8/17 - 6/9/17

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S1	11/28/17
ITECH	IT6122	PS-DC03-S1	11/28/17
Fluke Digital Thermometer	52k/J	MT-TP02-GC	11/28/17
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

Test Summary

Manufacturer:	Revolution Lighting Technologies (RVLT)	
Model Number:	204220-013	
Driver Model Number:	GE ULTRAMAX GE232MAXP-N/ULTRA	
Total Lumens:	1755.07	
Input Voltage (VAC/60Hz):	120.00	
Input Current (Amp):	0.12	
Input Power (W):	13.93	
Input Power Factor:	1.00	
Current ATHD @ 120V(%):	7%	
Current ATHD @ 277V(%):	11% (0.05A, 13.96W, 0.95PF)	
Efficacy:	126	
Color Rendering Index (CRI):	83	
Correlated Color Temperature (K):	3905	
Chromaticity Coordinate x:	0.3852	
Chromaticity Coordinate y:	0.3812	
Ambient Temperature (°C):	25.0	
Stabilization Time (Hours):	0:30	
Total Operating Time (Hours):	1:05	

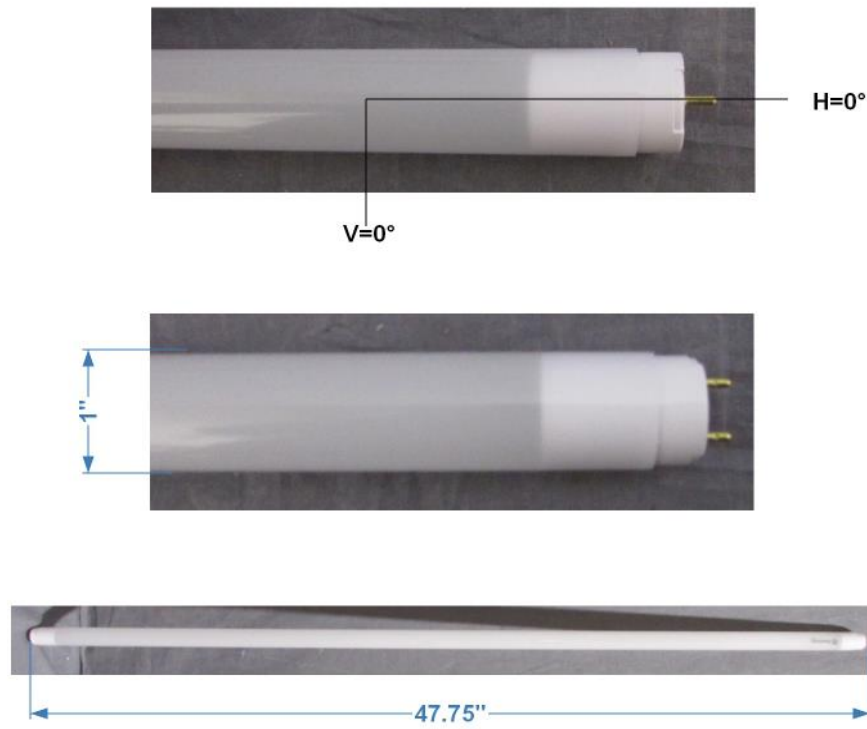
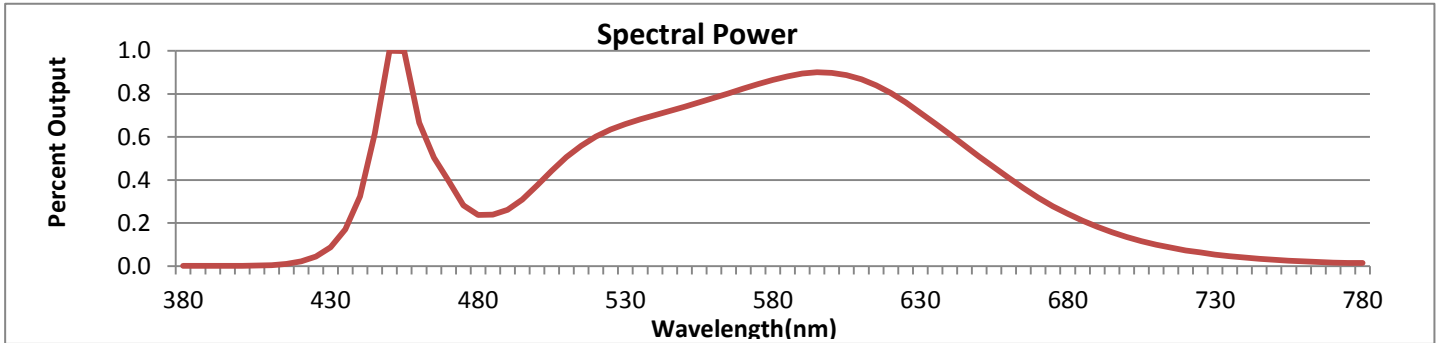


FIG. 1 LUMINAIRE

*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.



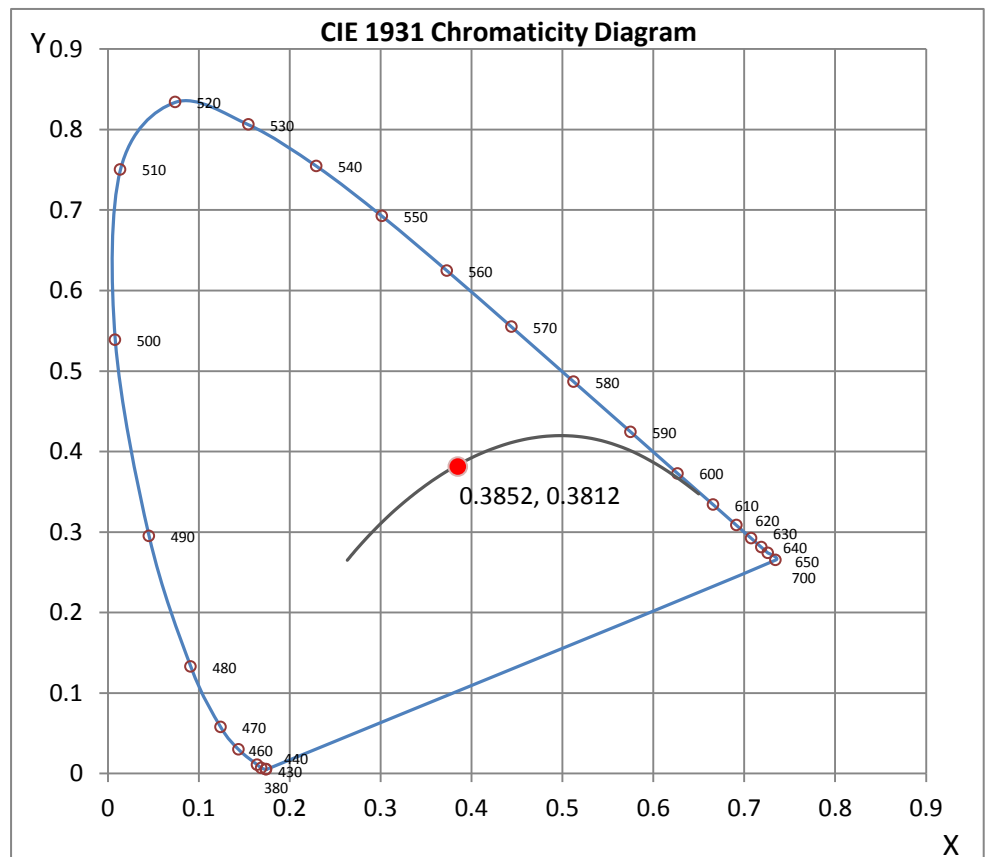
Wavelength	W/m ² nm	440	0.3239	510	0.5066	580	0.8655	650	0.5087	720	0.0731
380	0.0009	450	1.0000	520	0.6015	590	0.8944	660	0.4100	730	0.0538
390	0.0010	460	0.6662	530	0.6600	600	0.8980	670	0.3180	740	0.0396
400	0.0016	470	0.3945	540	0.7011	610	0.8678	680	0.2429	750	0.0293
410	0.0041	480	0.2373	550	0.7403	620	0.8038	690	0.1819	760	0.0219
420	0.0213	490	0.2615	560	0.7815	630	0.7116	700	0.1353	770	0.0162
430	0.0880	500	0.3744	570	0.8255	640	0.6118	710	0.0996	780	0.0141

CRI & CCT

x	0.3852
y	0.3812
u'	0.2265
v'	0.5042
CRI	83.20
CCT	3905
Duv	0.00071

R Values

R1	81.96
R2	88.98
R3	93.56
R4	81.99
R5	80.95
R6	83.72
R7	87.30
R8	67.05
R9	15.31
R10	72.75
R11	80.19
R12	56.74
R13	83.69
R14	96.09



*All Results in accordance to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.

Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government.

Report Prepared by : Keyur Patel

Test Report Released by:



Jeff Ahn
Engineering Manager

Test Report Reviewed by:



Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 10*



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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061702601.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L061702601
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 6/9/2017
[MANUFAC] Revolution Lighting Technologies (RVLT)
[LUMCAT] 204220-013
[LUMINAIRE] 12W G2 Uni-Fit Ballast-Ready Tube Lamp 4000K
[BALLASTCAT] GE ULTRAMAX GE232MAXP-N/ULTRA
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[_TEST CONDITION] GE ULTRAMAX GE232MAXP-N/ULTRA DRIVER WAS CONNECTED
[MORE] TO TWO LED TUBES FROM THE DRIVER OUTPUT.
[MORE] PHOTOMETRIC MEASUREMENTS WERE MEASURED FROM
[MORE] A SINGLE LED TUBE WHILE THE OTHER LAMP WAS POWERED
[MORE] AND COVERED WITH BLACK VELVET TO PREVENT ANY LIGHT POLLUTION.
[MORE] INPUT POWER OF SINGLE MEASURED MODULE IS CALCULATED
[MORE] FROM THE TOTAL POWER DIVIDED BY TWO.
[INPUT] 120VAC, 13.93W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1755
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	126
Total Luminaire Watts	13.93
Ballast Factor	1.00
CIE Type	Semi-Direct
Spacing Criterion (0-180)	1.22
Spacing Criterion (90-270)	1.42
Spacing Criterion (Diagonal)	1.46
Basic Luminous Shape	Rectangular w/Sides
Luminous Length (0-180)	3.81 ft
Luminous Width (90-270)	0.08 ft
Luminous Height	0.04 ft

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061702601.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	10508	9515	9941
55	9607	9090	9860
65	8447	8915	9989
75	6743	9163	10451
85	3271	10279	11543

**IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061702601.IES**

CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>
0	351.14	351.14	351.14	351.14	351.14
5	349.00	349.50	350.04	350.21	350.08
10	342.94	344.15	346.06	347.63	348.34
15	334.22	335.51	339.58	343.36	344.93
20	320.61	323.84	331.57	337.50	340.04
25	303.75	308.81	320.31	329.95	334.39
30	283.57	291.17	306.99	321.81	327.83
35	261.48	271.36	292.17	311.55	319.36
40	238.15	249.65	276.10	300.14	309.56
45	212.82	227.40	259.53	287.89	298.85
50	185.50	204.15	241.80	274.56	287.22
55	158.52	180.40	223.95	260.57	274.77
60	131.78	157.44	206.72	246.62	261.65
65	103.46	135.31	189.45	231.96	247.95
70	75.65	113.80	173.05	217.31	233.91
75	51.40	94.75	157.77	203.11	219.72
80	27.32	78.18	143.45	188.99	205.60
85	9.05	64.85	130.16	175.00	191.48
90	1.08	54.56	118.49	162.13	177.87
95	0.58	47.50	107.95	149.80	164.58
100	0.00	43.10	98.77	138.22	152.54
105	0.00	40.77	91.13	127.67	141.00
110	0.00	39.69	84.78	118.00	130.12
115	0.00	39.78	78.64	108.99	119.82
120	0.00	40.40	73.61	100.47	110.61
125	0.00	41.48	69.75	93.04	101.97
130	0.00	43.10	66.72	86.61	93.00
135	0.00	43.68	63.81	80.75	86.19
140	0.00	43.55	60.20	75.23	80.38
145	0.00	42.81	56.71	70.87	74.90
150	0.00	39.24	53.23	66.14	69.67
155	0.00	33.05	51.23	60.53	64.69
160	0.00	29.35	47.87	54.39	61.20
165	0.00	24.91	38.36	46.71	57.46
170	0.00	20.01	29.69	33.01	44.09
175	0.00	14.86	19.80	21.30	19.18
180	0.00	0.00	0.00	0.00	0.00

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L061702601.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	129.17	N.A.	7.40
0-30	276.59	N.A.	15.80
0-40	459.10	N.A.	26.20
0-60	855.66	N.A.	48.80
0-80	1193.82	N.A.	68.00
0-90	1322.83	N.A.	75.40
10-90	1289.57	N.A.	73.50
20-40	329.94	N.A.	18.80
20-50	528.96	N.A.	30.10
40-70	578.22	N.A.	32.90
60-80	338.16	N.A.	19.30
70-80	156.50	N.A.	8.90
80-90	129.01	N.A.	7.40
90-110	193.75	N.A.	11.00
90-120	265.27	N.A.	15.10
90-130	322.69	N.A.	18.40
90-150	400.08	N.A.	22.80
90-180	432.23	N.A.	24.60
110-180	238.48	N.A.	13.60
0-180	1755.07	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	33.27
10-20	95.90
20-30	147.42
30-40	182.51
40-50	199.02
50-60	197.54
60-70	181.67
70-80	156.50
80-90	129.01
90-100	106.17
100-110	87.58
110-120	71.51
120-130	57.42
130-140	44.81
140-150	32.58
150-160	20.62
160-170	9.81
170-180	1.72

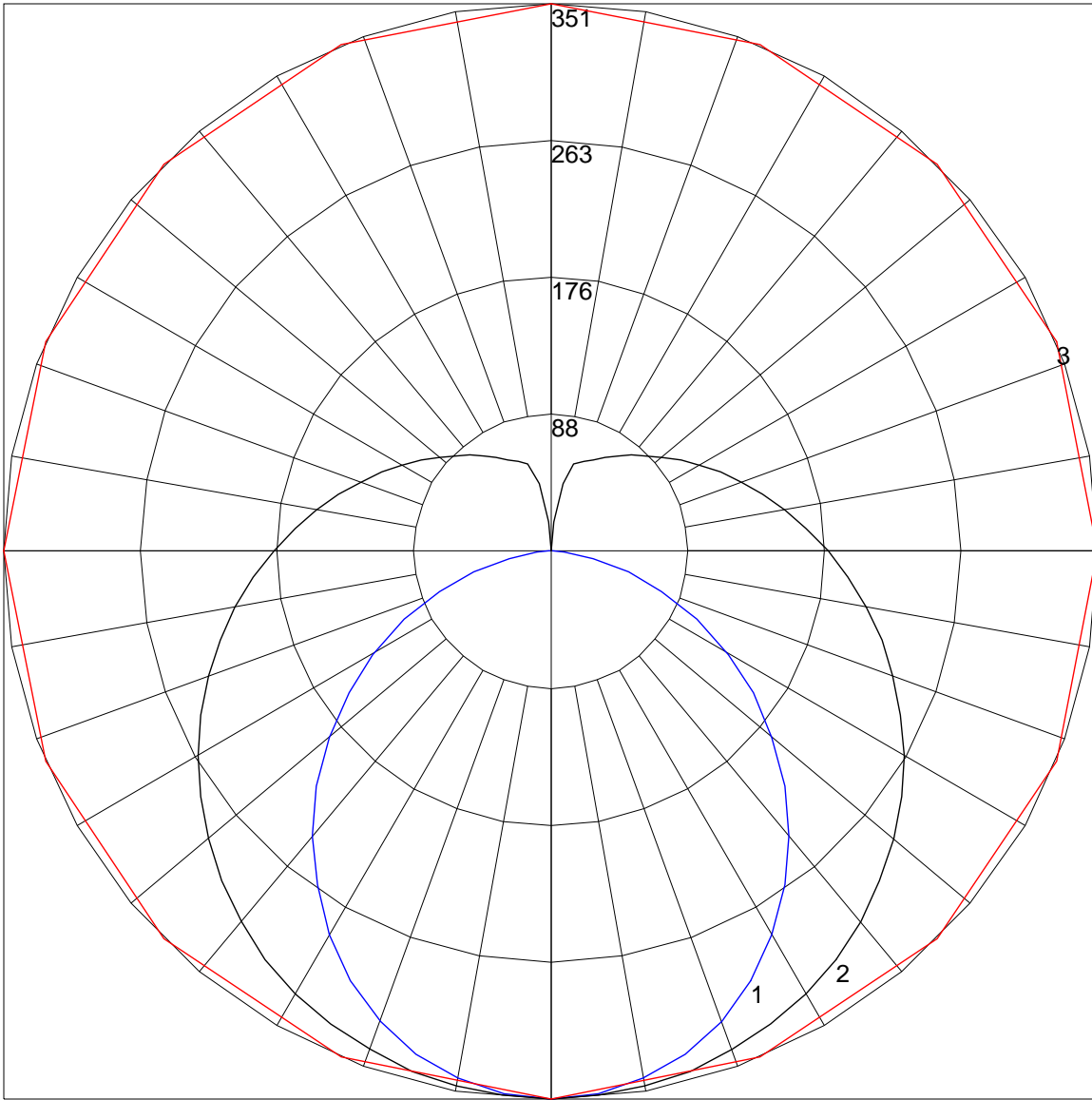
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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	113	113	113	113	108	108	108	108	97	97	97	88	88	88	79	79	79	75
1	100	94	89	84	95	90	85	81	81	77	73	73	70	67	65	63	61	57
2	90	81	73	66	85	77	70	64	69	63	58	62	57	54	56	52	49	45
3	81	70	61	54	77	67	58	52	60	53	48	54	49	44	48	44	40	37
4	74	61	52	45	70	58	50	43	53	46	40	48	42	37	43	38	34	31
5	68	55	45	38	64	52	43	37	47	40	34	42	36	32	38	33	29	26
6	63	49	40	33	59	47	38	32	42	35	30	38	32	27	34	29	25	23
7	58	44	35	29	55	42	34	28	38	31	26	35	29	24	31	26	22	20
8	54	40	31	25	51	38	30	25	35	28	23	32	26	21	29	24	20	18
9	50	37	28	23	47	35	27	22	32	25	21	29	23	19	27	22	18	16
10	47	34	26	20	44	32	25	20	30	23	19	27	21	17	25	20	16	14

POLAR GRAPH



Maximum Candela = 351.14 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)
2 - Vertical Plane Through Horizontal Angles (90 - 270)
3 - Horizontal Cone Through Vertical Angle (0) (Through Max. Cd.)