

ILLUMADYNE, INC

TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

2VC-UNV-26-UG-4000

PROJECT NUMBER

G104920550

REPORT NUMBER

104920550CRT-001

ISSUE DATE

1/5/2022

REVISED DATE

None

TEST DATES

January 3, 2022 through January 5, 2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104920550CRT-001

MODEL NUMBER(s)

2VC-UNV-26-UG-4000

REPORT RENDERED TO:

ILLUMADYNE, INC
3840 HOPKINS STREET
PENSACOLA, FL 32534

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01232977-0.

TEST STANDARDS

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

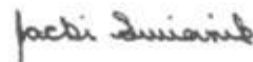
ANSI/UL 1598-2018: Standard for Safety - Luminaires

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
Lighting Division



Jacki Swiernik
Staff Engineer
Lighting Division

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SAMPLE INFORMATION

REPORT NO. 104920550CRT-001

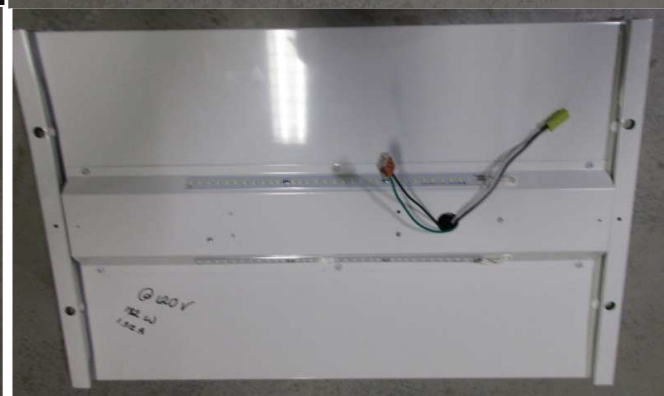
ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2112271218-001A	2VC-UNV-26-UG-4000	Prismatic Lens	Production	12/27/2021
2	CRT2112271218-001B	2VC-UNV-26-UG-4000	Diffused Lens	Production	12/27/2021

TESTED SAMPLE CONFIGURATIONS

Config No.	Tested Model No.	Item Nos. Utilized
1	2VC-UNV-26-UG-4000	1
2	2VC-UNV-26-UG-4000	2

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

REPORT NO. 104920550CRT-001

PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	2VC-UNV-26-UG-4000
Product Description:	2' Highbay with uplight
LED Model No.:	Samsung SPMWH1228FD5WARUSC
Driver Model No.:	Illuma-Source IEF-U-02-150W-A
Light Source:	LED

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with IESNA LM-79.

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral distribution for each EUT resulting in photometric and colorimetric data. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position inside the sphere and stabilization procedures to LM-79 were followed.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature was measured at a position near the EUT at equal height and stabilization procedures to LM-79 were followed.

INSITU TEMPERATURE MEASUREMENT TESTING*

Thermal measurements were taken on the EUT using a thermocouple and temperature meter. The EUT was allowed to reach thermal equilibrium for three and a half to seven and a half hours before measurements were taken. Temperatures were measured at the TMPs or Ts point as indicated by the included diagram in accordance with manufacturers declared thermal test point location, or at a thermal test point location found with a thermal camera when no diagram from the manufacturer is given. The maximum temperature was recorded for the sample. A simulated ceiling or other enclosure may be used in accordance to UL 1598, UL 153, or UL 1993 as applicable.

*Not NVLAP Accredited

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 104920550CRT-001

Test Configuration	Tested Model No.	Pass/Fail/NA
1	2VC-UNV-26-UG-4000	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

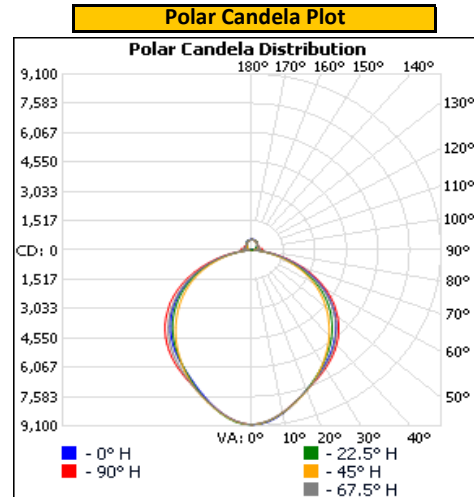
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.07	1480.5	177.6	0.999

Light Output (lm)	Lumen Efficacy (lm/W)
25736.0	144.9

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	9032	9032	9032	9032	9032
5	8920	8894	8880	8870	8880
10	8579	8550	8548	8529	8534
15	8140	8130	8156	8117	8102
20	7695	7696	7731	7718	7712
25	7292	7260	7290	7350	7386
30	6934	6831	6810	6995	7072
35	6564	6398	6307	6628	6734
40	6164	5952	5785	6216	6345
45	5718	5457	5224	5744	5907
50	5223	4932	4670	5197	5387
55	4623	4323	4076	4597	4815
60	3961	3669	3447	3920	4130
65	3222	2957	2782	3173	3384
70	2436	2218	2086	2393	2580
75	1631	1471	1388	1604	1750
80	857	776	736	870	973
85	287	257	249	307	359
90	0	19	91	129	140
95	19	130	352	276	284
100	54	148	292	374	401
105	98	167	289	353	370
110	149	193	296	347	364
115	203	223	305	353	368
120	253	258	319	357	372
125	299	295	332	368	372
130	343	334	344	379	378
135	382	369	370	385	393
140	418	408	401	399	401
145	450	440	432	422	420
150	479	465	459	450	449
155	503	488	481	476	478
160	522	506	500	499	500
165	536	521	514	514	515
170	545	530	527	528	525
175	550	535	535	536	532
180	536	536	536	536	536

Entire luminous intensity matrix found in .IES file



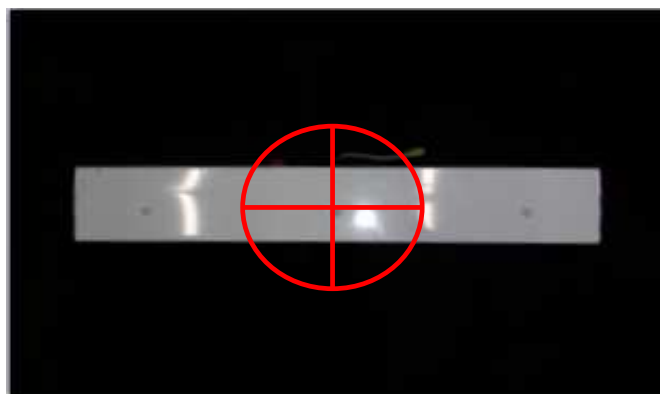
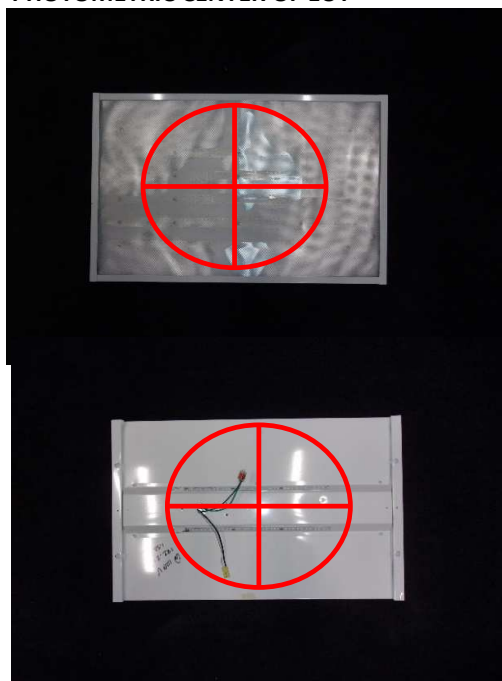
REPORT NO. 104920550CRT-001

ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
1.90	1.23	0.00
0°-180° H	90°-270° H	0°-180° V

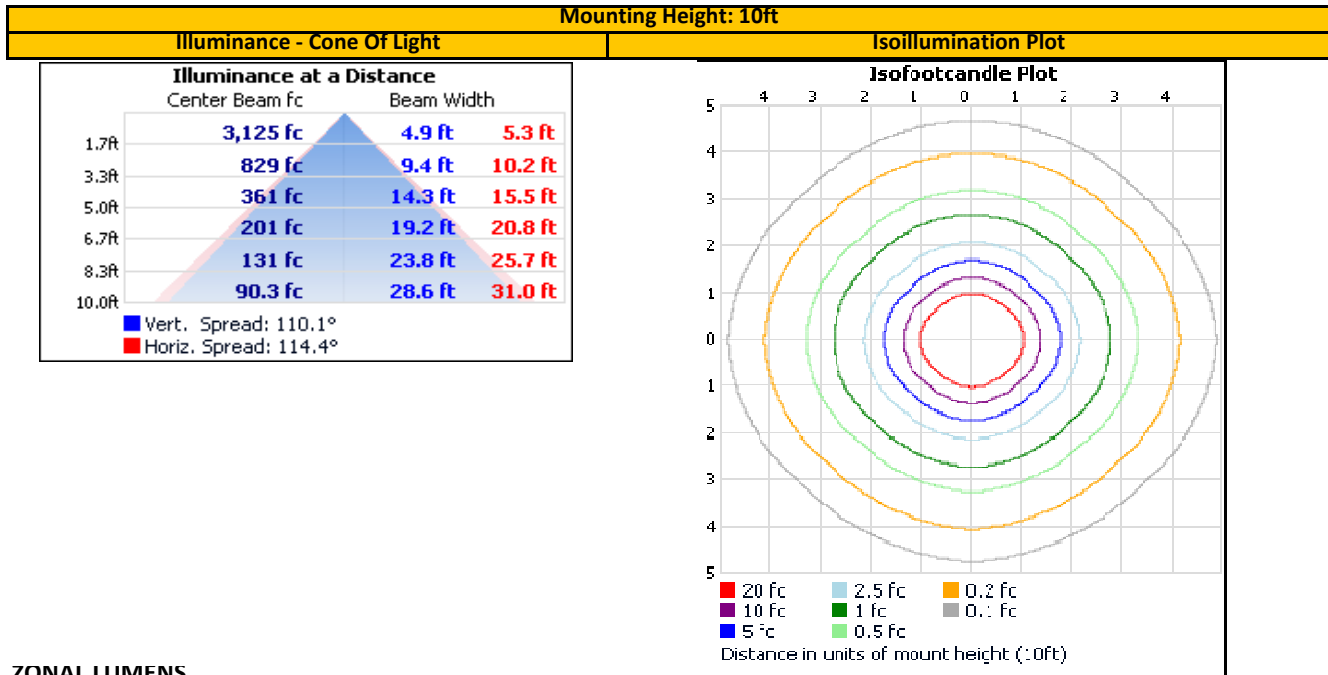
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



REPORT NO. 104920550CRT-001

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary									
Zone			Zone						
Zone	Lumens	Luminaire	Zone	Lumens	Total	Zone	Lumens	Total	
0-30	6,492.3	25.2%	0-10	837.2	3.3%	90-100	221.2	0.9%	
0-40	10,537.8	40.9%	10-20	2291.7	8.9%	100-110	268.8	1.0%	
0-60	18,714.7	72.7%	20-30	3363.4	13.1%	110-120	279.8	1.1%	
60-90	4,988.0	19.4%	30-40	4045.5	15.7%	120-130	289.5	1.1%	
70-100	2,216.2	8.6%	40-50	4259.2	16.5%	130-140	287.1	1.1%	
90-120	769.8	3.0%	50-60	3917.7	15.2%	140-150	267.9	1.0%	
0-90	23,702.8	92.1%	60-70	2993.1	11.6%	150-160	221.9	0.9%	
90-180	2,033.2	7.9%	70-80	1624.6	6.3%	160-170	146.2	0.6%	
0-180	25,736.0	100.0%	80-90	370.4	1.4%	170-180	50.9	0.2%	

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UNIFIED GLARE RATING (UGR) SUMMARY

Reflectances					
Ceiling Cavity	70	70	50	50	30
Walls	50	30	50	30	30
Floor Cavity	20	20	20	20	20

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Crosswise				
24.1	25.5	24.6	26.0	26.5
25.9	27.2	26.4	27.7	28.3
26.6	27.8	27.1	28.3	28.9
27.0	28.1	27.5	28.6	29.2
27.0	28.1	27.6	28.7	29.3
27.1	28.1	27.6	28.7	29.3

4H	2H
	3H
	4H
	6H
	8H
	12H

24.6	25.8	25.1	26.3	26.9
26.6	27.7	27.2	28.2	28.8
27.4	28.3	27.9	28.9	29.5
27.9	28.7	28.4	29.3	29.9
28.0	28.8	28.6	29.3	30.0
28.1	28.8	28.7	29.4	30.0

8H	4H
	6H
	8H
	12H

27.6	28.4	28.2	28.9	29.6
28.2	28.8	28.8	29.4	30.1
28.3	28.9	29.0	29.5	30.2
28.5	29.0	29.1	29.6	30.3

12H	4H
	6H
	8H

27.6	28.3	28.2	28.9	29.6
28.2	28.8	28.8	29.4	30.1
28.4	28.9	29.0	29.5	30.3

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Endwise				
24.5	25.9	24.9	26.4	26.9
26.3	27.6	26.8	28.1	28.7
27.0	28.2	27.5	28.7	29.3
27.4	28.6	27.9	29.1	29.7
27.5	28.6	28.1	29.2	29.7
27.6	28.6	28.1	29.2	29.8

4H	2H
	3H
	4H
	6H
	8H
	12H

24.9	26.1	25.4	26.6	27.2
27.0	28.0	27.5	28.5	29.1
27.7	28.7	28.3	29.2	29.9
28.3	29.1	28.9	29.7	30.3
28.4	29.2	29.0	29.8	30.4
28.5	29.2	29.1	29.8	30.5

8H	4H
	6H
	8H
	12H

27.9	28.7	28.5	29.3	29.9
28.6	29.2	29.2	29.8	30.5
28.8	29.4	29.4	30.0	30.7
28.9	29.4	29.6	30.1	30.8

12H	4H
	6H
	8H

27.9	28.6	28.5	29.2	29.9
28.6	29.2	29.2	29.8	30.5
28.8	29.3	29.5	30.0	30.7

Maximum UGR	
30.8	

INTEGRATING SPHERE TESTING

REPORT NO. 104920550CRT-001

Test Configuration	Tested Model No.	Pass/Fail/NA
1	2VC-UNV-26-UG-4000	NA

PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

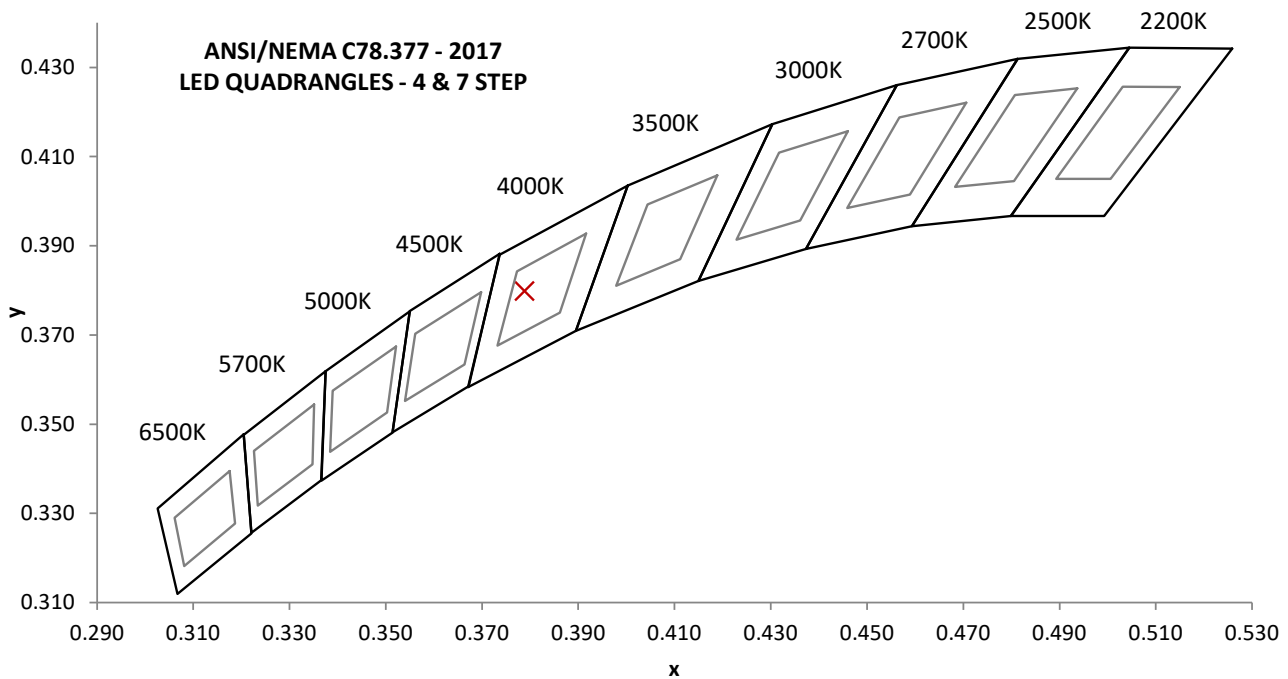
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.02	1490.0	178.7	0.999	3.5
277.05	641.4	172.5	0.971	11.8

Measured at 120.02(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
26323.1	147.3	4066	94.1	73.2

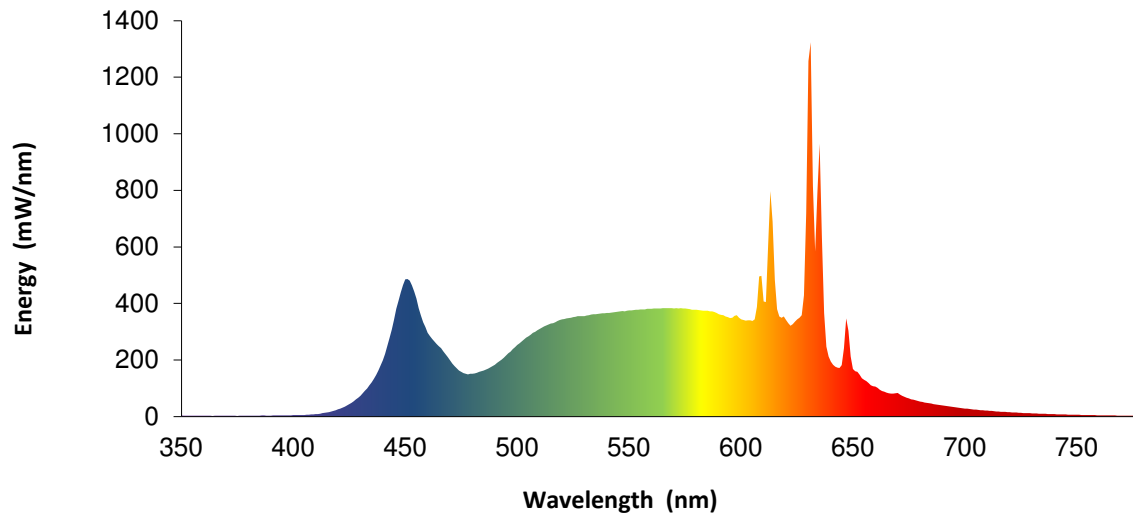
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0019	0.379	0.380	0.223	0.503



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	4.2	460	296.4	570	382.3	680	53.4
355	3.3	465	248.5	575	382.1	685	45.7
360	2.7	470	198.4	580	377.7	690	39.3
365	3.1	475	158.3	585	374.3	695	33.6
370	2.7	480	151.2	590	361.9	700	28.6
375	2.4	485	162.5	595	348.4	705	24.6
380	3.2	490	183.0	600	343.5	710	20.8
385	3.4	495	216.3	605	338.2	715	17.8
390	3.6	500	252.8	610	407.2	720	15.3
395	4.3	505	284.1	615	483.0	725	13.2
400	4.9	510	310.0	620	341.6	730	11.3
405	5.9	515	329.2	625	343.9	735	9.7
410	8.7	520	343.7	630	1257.3	740	8.4
415	14.3	525	351.5	635	965.4	745	7.2
420	25.5	530	355.6	640	194.8	750	6.2
425	43.5	535	361.5	645	181.9	755	5.4
430	73.6	540	365.9	650	168.5	760	4.8
435	120.8	545	370.7	655	129.7	765	4.1
440	199.1	550	374.9	660	106.1	770	3.5
445	342.8	555	378.8	665	85.1	775	3.1
450	484.7	560	380.9	670	83.0	780	2.7
455	417.2	565	382.9	675	63.8	---	---



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

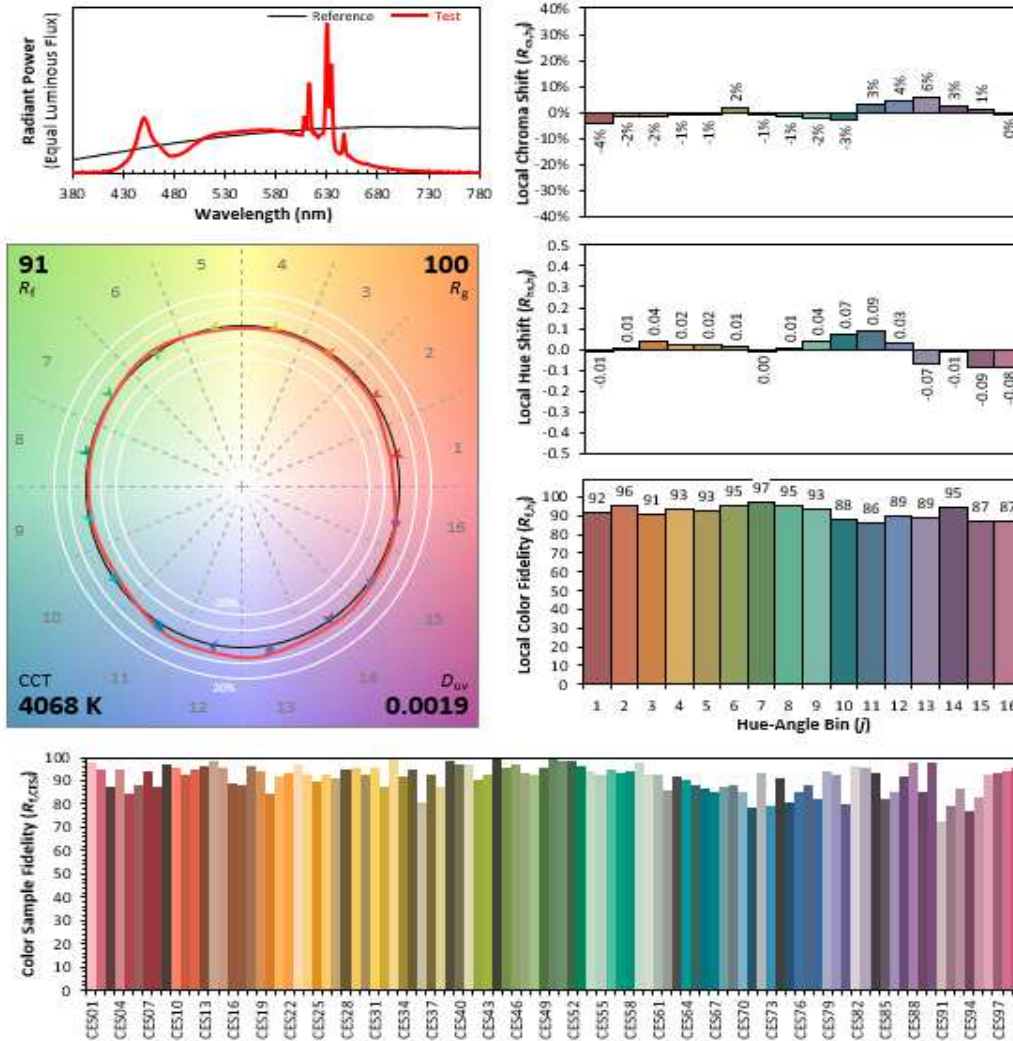
Input Voltage (Vac)	Output Voltage (Vdc)	Output Current (mA)	Output Power (W)	Efficiency (%)
120.0	43.41	3700.0	160.6	89.89
277.1	43.43	3699.0	160.6	93.14

ANNEX A - TM-30 CALCULATIONS

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Test Configuration	Tested Model No.	Pass/Fail/NA
1	2VC-UNV-26-UG-4000	NA

TM-30 REPORT



TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

REPORT NO. 104920550CRT-001

Test Configuration	Tested Model No.	Pass/Fail/NA
2	2VC-UNV-26-UG-4000	NA

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

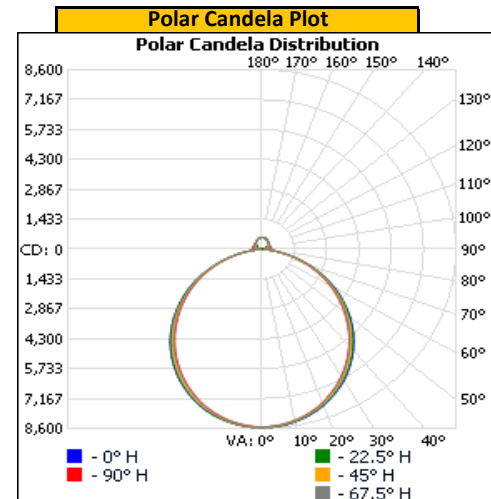
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Up	120.01	1482.3	177.7	0.999

Light Output (lm)	Lumen Efficacy (lm/W)
25808.3	145.3

INTENSITY SUMMARY - CANDELA

Angle	0	22.5	45	67.5	90
0	8541	8541	8541	8541	8541
5	8525	8516	8497	8483	8473
10	8412	8400	8373	8352	8340
15	8231	8213	8171	8137	8124
20	7976	7955	7896	7852	7831
25	7652	7624	7553	7491	7463
30	7273	7230	7140	7066	7034
35	6813	6772	6671	6581	6548
40	6303	6250	6146	6042	6010
45	5740	5683	5568	5467	5428
50	5118	5061	4942	4851	4811
55	4438	4402	4308	4207	4166
60	3751	3707	3632	3539	3497
65	3009	2984	2928	2849	2806
70	2264	2241	2202	2150	2114
75	1518	1506	1484	1452	1422
80	801	802	800	785	774
85	243	247	250	253	252
90	0	27	96	134	141
95	20	143	263	287	299
100	57	165	300	399	432
105	105	183	297	368	388
110	161	208	306	367	383
115	215	237	319	373	386
120	265	275	334	382	394
125	312	315	347	392	404
130	358	356	364	400	410
135	399	395	392	406	411
140	436	432	423	421	418
145	468	464	454	446	443
150	497	492	484	474	468
155	519	515	508	500	492
160	539	535	529	523	518
165	552	549	544	540	538
170	560	558	555	552	555
175	565	562	561	560	568
180	563	563	563	563	563

Entire luminous intensity matrix found in .IES file



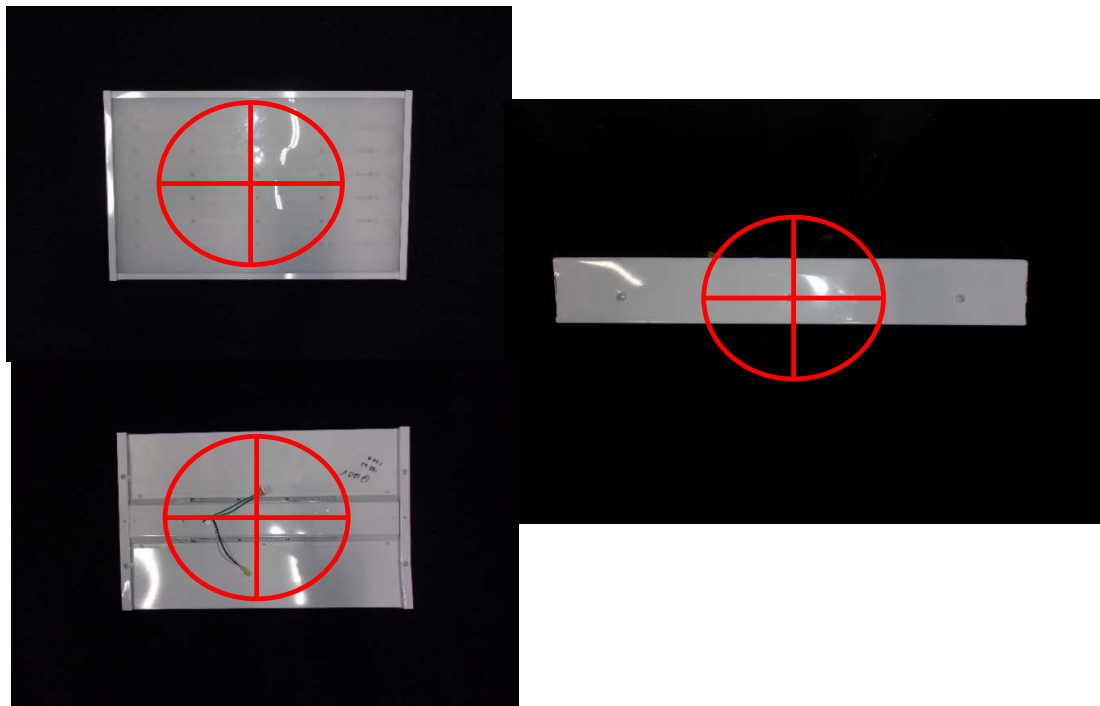
REPORT NO. 104920550CRT-001

ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
1.90	1.23	0.00
0°-180° H	90°-270° H	0°-180° V

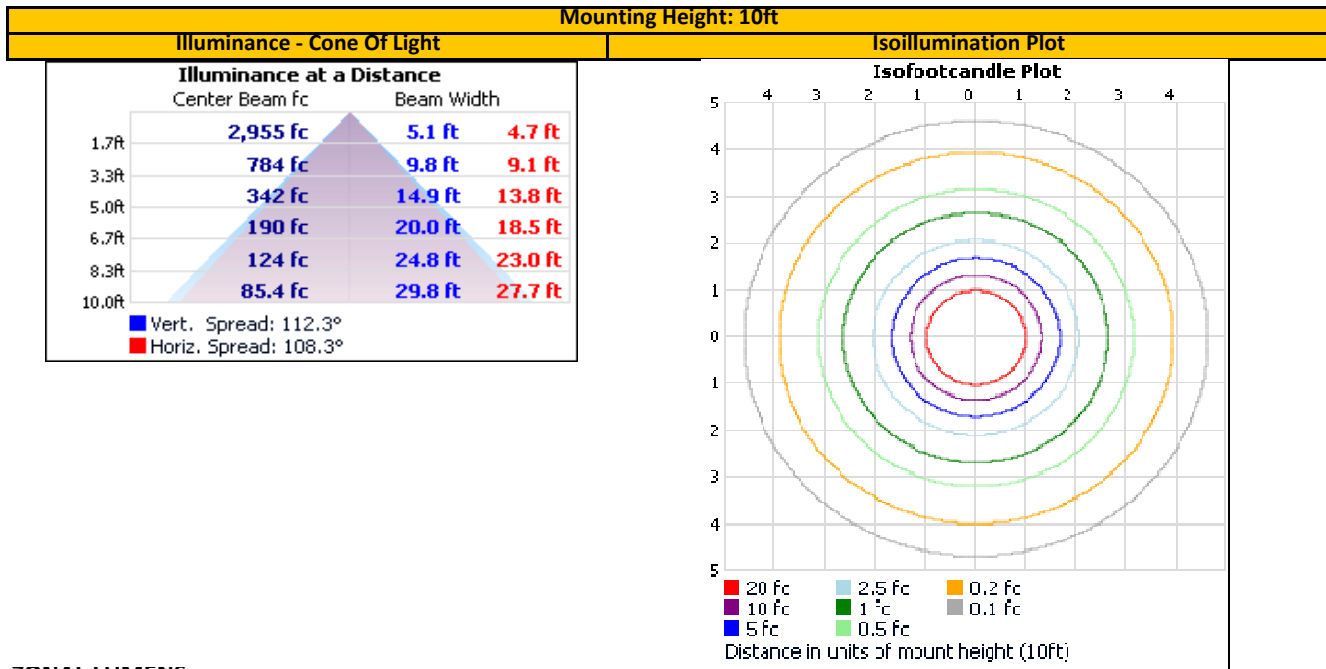
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



REPORT NO. 104920550CRT-001

ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary																																																																																																			
<table><tr><th>Zone</th><th>Lumens</th><th>Luminaire</th></tr><tr><td>0-30</td><td>6,600.8</td><td>25.6%</td></tr><tr><td>0-40</td><td>10,779.6</td><td>41.8%</td></tr><tr><td>0-60</td><td>18,926.5</td><td>73.3%</td></tr><tr><td>60-90</td><td>4,768.0</td><td>18.5%</td></tr><tr><td>70-100</td><td>2,104.1</td><td>8.2%</td></tr><tr><td>90-120</td><td>790.8</td><td>3.1%</td></tr><tr><td>0-90</td><td>23,694.5</td><td>91.8%</td></tr><tr><td>90-180</td><td>2,113.8</td><td>8.2%</td></tr><tr><td>0-180</td><td>25,808.3</td><td>100.0%</td></tr></table>			Zone	Lumens	Luminaire	0-30	6,600.8	25.6%	0-40	10,779.6	41.8%	0-60	18,926.5	73.3%	60-90	4,768.0	18.5%	70-100	2,104.1	8.2%	90-120	790.8	3.1%	0-90	23,694.5	91.8%	90-180	2,113.8	8.2%	0-180	25,808.3	100.0%	<table><tr><th>Zone</th><th>Lumens</th><th>Total</th><th>Zone</th><th>Lumens</th><th>Total</th></tr><tr><td>0-10</td><td>807.4</td><td>3.1%</td><td>90-100</td><td>214.5</td><td>0.8%</td></tr><tr><td>10-20</td><td>2308.3</td><td>8.9%</td><td>100-110</td><td>281.9</td><td>1.1%</td></tr><tr><td>20-30</td><td>3485.1</td><td>13.5%</td><td>110-120</td><td>294.4</td><td>1.1%</td></tr><tr><td>30-40</td><td>4178.8</td><td>16.2%</td><td>120-130</td><td>306.4</td><td>1.2%</td></tr><tr><td>40-50</td><td>4301.2</td><td>16.7%</td><td>130-140</td><td>301.0</td><td>1.2%</td></tr><tr><td>50-60</td><td>3845.7</td><td>14.9%</td><td>140-150</td><td>279.2</td><td>1.1%</td></tr><tr><td>60-70</td><td>2878.3</td><td>11.2%</td><td>150-160</td><td>230.8</td><td>0.9%</td></tr><tr><td>70-80</td><td>1555.1</td><td>6.0%</td><td>160-170</td><td>152.4</td><td>0.6%</td></tr><tr><td>80-90</td><td>334.6</td><td>1.3%</td><td>170-180</td><td>53.3</td><td>0.2%</td></tr></table>							Zone	Lumens	Total	Zone	Lumens	Total	0-10	807.4	3.1%	90-100	214.5	0.8%	10-20	2308.3	8.9%	100-110	281.9	1.1%	20-30	3485.1	13.5%	110-120	294.4	1.1%	30-40	4178.8	16.2%	120-130	306.4	1.2%	40-50	4301.2	16.7%	130-140	301.0	1.2%	50-60	3845.7	14.9%	140-150	279.2	1.1%	60-70	2878.3	11.2%	150-160	230.8	0.9%	70-80	1555.1	6.0%	160-170	152.4	0.6%	80-90	334.6	1.3%	170-180	53.3	0.2%
Zone	Lumens	Luminaire																																																																																																	
0-30	6,600.8	25.6%																																																																																																	
0-40	10,779.6	41.8%																																																																																																	
0-60	18,926.5	73.3%																																																																																																	
60-90	4,768.0	18.5%																																																																																																	
70-100	2,104.1	8.2%																																																																																																	
90-120	790.8	3.1%																																																																																																	
0-90	23,694.5	91.8%																																																																																																	
90-180	2,113.8	8.2%																																																																																																	
0-180	25,808.3	100.0%																																																																																																	
Zone	Lumens	Total	Zone	Lumens	Total																																																																																														
0-10	807.4	3.1%	90-100	214.5	0.8%																																																																																														
10-20	2308.3	8.9%	100-110	281.9	1.1%																																																																																														
20-30	3485.1	13.5%	110-120	294.4	1.1%																																																																																														
30-40	4178.8	16.2%	120-130	306.4	1.2%																																																																																														
40-50	4301.2	16.7%	130-140	301.0	1.2%																																																																																														
50-60	3845.7	14.9%	140-150	279.2	1.1%																																																																																														
60-70	2878.3	11.2%	150-160	230.8	0.9%																																																																																														
70-80	1555.1	6.0%	160-170	152.4	0.6%																																																																																														
80-90	334.6	1.3%	170-180	53.3	0.2%																																																																																														

REPORT NO. 104920550CRT-001

UNIFIED GLARE RATING (UGR) SUMMARY

Reflectances					
Ceiling Cavity	70	70	50	50	30
Walls	50	30	50	30	30
Floor Cavity	20	20	20	20	20

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Crosswise				
24.1	25.5	24.6	26.0	26.5
25.8	27.1	26.3	27.6	28.2
26.4	27.6	26.9	28.2	28.7
26.8	27.9	27.3	28.5	29.0
26.9	28.0	27.4	28.5	29.1
26.9	27.9	27.5	28.5	29.1

4H	2H
	3H
	4H
	6H
	8H
	12H

24.6	25.9	25.2	26.4	27.0
26.6	27.6	27.1	28.2	28.8
27.3	28.3	27.9	28.8	29.4
27.8	28.6	28.4	29.2	29.8
27.9	28.7	28.5	29.3	29.9
28.0	28.7	28.6	29.3	29.9

8H	4H
	6H
	8H
	12H

27.6	28.3	28.2	28.9	29.6
28.1	28.8	28.8	29.4	30.1
28.3	28.9	28.9	29.5	30.2
28.4	28.9	29.0	29.5	30.3

12H	4H
	6H
	8H

27.6	28.3	28.2	28.9	29.5
28.2	28.7	28.8	29.3	30.1
28.4	28.9	29.0	29.5	30.2

Room Size	
X=2H	Y=2H
	3H
	4H
	6H
	8H
	12H

UGR Viewed Endwise				
23.7	25.2	24.2	25.7	26.2
25.5	26.8	26.0	27.2	27.8
26.0	27.3	26.6	27.8	28.3
26.4	27.6	27.0	28.1	28.7
26.5	27.6	27.1	28.1	28.7
26.5	27.6	27.1	28.1	28.7

4H	2H
	3H
	4H
	6H
	8H
	12H

24.4	25.6	24.9	26.1	26.7
26.3	27.3	26.8	27.9	28.5
27.0	27.9	27.6	28.5	29.1
27.5	28.3	28.1	28.9	29.5
27.6	28.4	28.2	29.0	29.6
27.7	28.4	28.3	29.0	29.6

8H	4H
	6H
	8H
	12H

27.3	28.0	27.9	28.6	29.3
27.9	28.5	28.5	29.1	29.8
28.0	28.6	28.6	29.2	29.9
28.1	28.6	28.8	29.3	30.0

12H	4H
	6H
	8H

27.3	28.0	27.9	28.6	29.2
27.9	28.5	28.5	29.1	29.8
28.1	28.6	28.7	29.2	30.0

Maximum UGR	
30.3	

INTEGRATING SPHERE TESTING

REPORT NO. 104920550CRT-001

Test Configuration	Tested Model No.	Pass/Fail/NA
2	2VC-UNV-26-UG-4000	NA

PHOTOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS (25°C +/- 1°C)

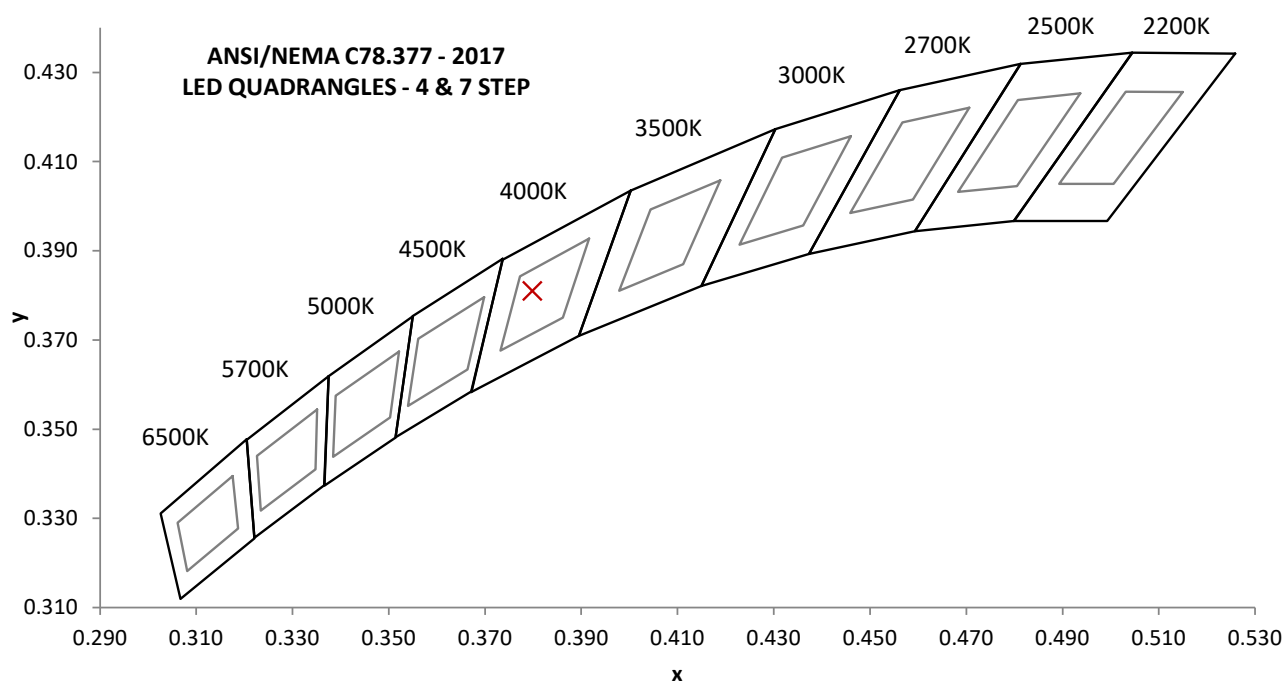
Base Orientation
Up

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.01	1489.0	178.5	0.999	4.4
277.04	642.3	172.7	0.970	12.5

Measured at 120.01(Vac)

Light Output (lm)	Lumen Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
26618.1	149.1	4047	94.0	72.7

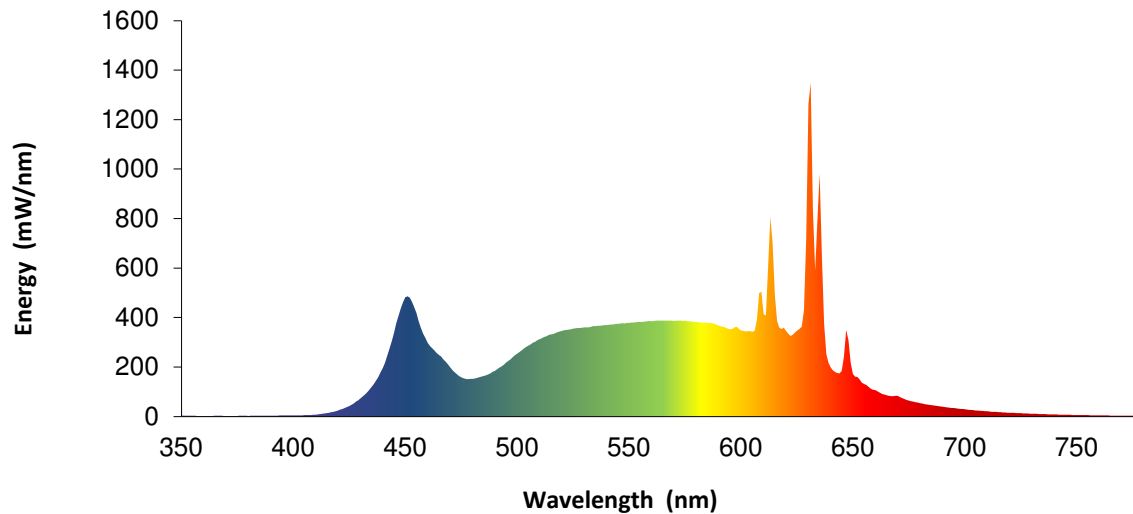
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0021	0.380	0.381	0.223	0.503



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SPECTRAL DISTRIBUTION OVER WAVELENGTHS

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	4.3		460	297.9		570	386.5		680	54.1
355	3.0		465	249.5		575	387.1		685	46.3
360	2.4		470	200.2		580	382.1		690	39.8
365	3.5		475	159.3		585	378.8		695	34.2
370	2.9		480	152.5		590	366.6		700	29.1
375	2.9		485	163.9		595	353.1		705	24.8
380	2.9		490	184.7		600	348.0		710	21.1
385	3.2		495	218.0		605	342.8		715	18.1
390	3.7		500	255.1		610	413.6		720	15.5
395	4.2		505	286.9		615	491.8		725	13.3
400	4.9		510	313.0		620	346.5		730	11.6
405	5.6		515	331.7		625	348.0		735	9.9
410	8.1		520	345.8		630	1263.2		740	8.5
415	13.8		525	355.0		635	980.7		745	7.3
420	24.8		530	360.2		640	197.4		750	6.3
425	42.5		535	365.2		645	184.4		755	5.5
430	73.1		540	369.5		650	171.6		760	4.8
435	119.6		545	375.3		655	131.4		765	4.1
440	196.4		550	379.0		660	107.5		770	3.6
445	338.5		555	382.9		665	86.5		775	3.2
450	482.4		560	385.4		670	84.2		780	2.8
455	418.0		565	387.3		675	64.9		---	---



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

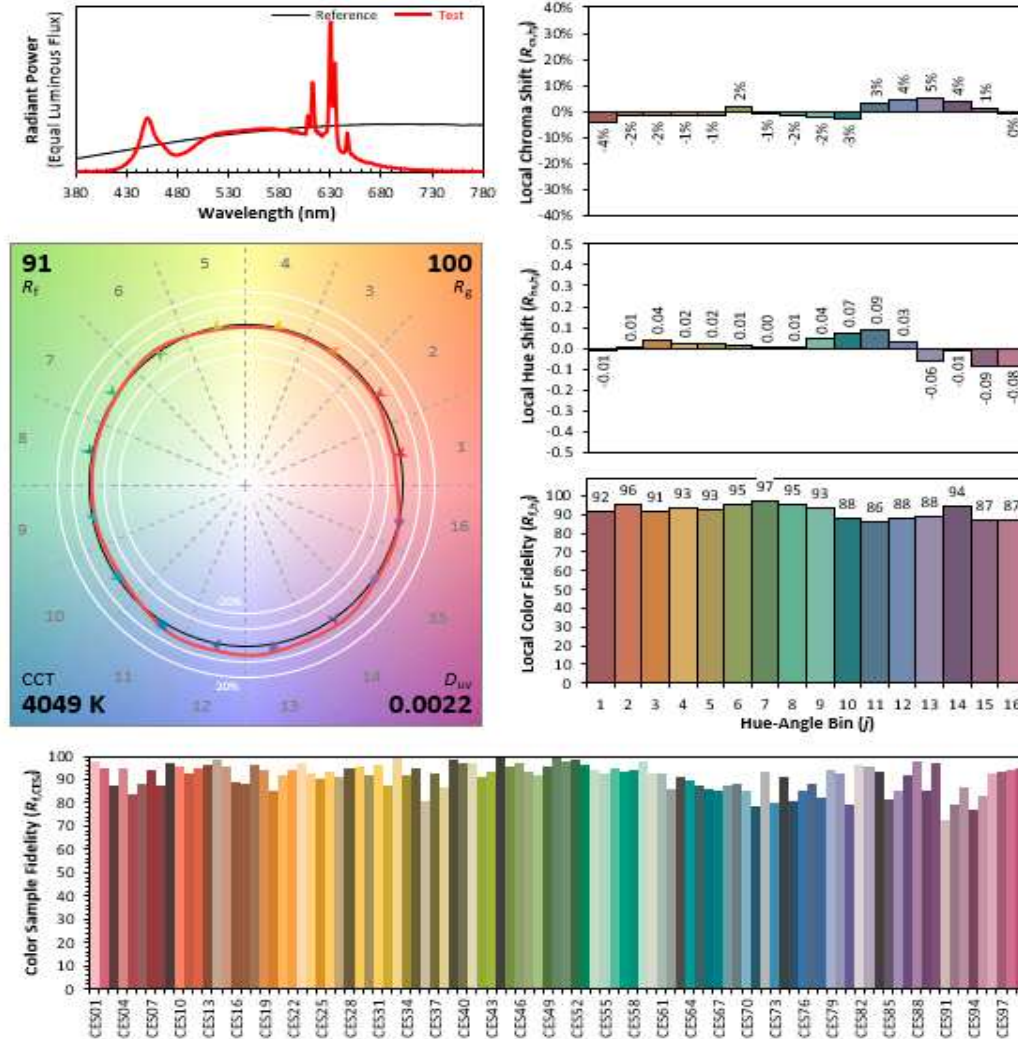
Input Voltage (Vac)	Output Voltage (Vdc)	Output Current (mA)	Output Power (W)	Efficiency (%)
120.01	43.41	3708.0	160.96	90.18
277.04	43.40	3709.0	160.97	93.22

ANNEX A - TM-30 CALCULATIONS

REPORT NO. 104920550CRT-001

Test Configuration	Tested Model No.	Pass/Fail/NA
2	2VC-UNV-26-UG-4000	NA

TM-30 REPORT



INSITU TEMPERATURE MEASUREMENT TESTING

REPORT NO. 104920550CRT-001

Test Configuration	Tested Model No.	Pass/Fail/NA
2	2VC-UNV-26-UG-4000	NA

LED MEASUREMENTS AND RATINGS

Mounting Type	Input Voltage (Vac)
Ceiling Surface	120.00

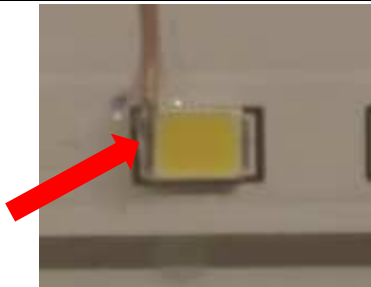
LED Model No.	Samsung SPMWH1228FD5WARUSC
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Max Junction Temp - T _j (°C)	Max Thermal Resistance - R _{th} (°C/W)	Max Forward Voltage - V _f (V)
115.0	25.0	3.0

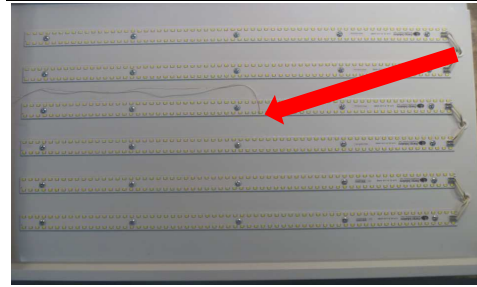
Measured LED Current (mA)	Measured LED Temp - T _s (°C)	Max LED Temp - T _s Max (°C)
66.2	67.5	110.0

Max LED Temp = Max Junction Temp – (LED Wattage x Thermal Resistance)

ISTMT Photo - T_s



ISTMT Photo - T_s Location



LED SOURCE MANUFACTURER'S SUPPORTING DOCUMENTATION

Item	Symbol	Rating	Unit	Condition
Ambient / Operating Temperature	T _a	-40 ~ +85	°C	-
Storage Temperature	T _{stg}	-40 ~ +85	°C	-
LED Junction Temperature	T _j	115	°C	-
Forward Current	I _F	160	mA	-

Item	Unit	Rank	Bin	Min.	Typ.	Max.
Forward Voltage (V _F)	V	WA or WK	A1	2.8		2.9
			A2	2.9		3.0
			A3	3.0		3.1
			A4	3.1		3.2
		WN or WM	A1	2.8		2.9
			A2	2.9		3.0
Color Rendering Index (Ra)	-	5		80	-	-
		7		90		
Special CRI (R9)	For Ra 90			50		
Thermal Resistance (junction to solder point)	°C/W			-	25	-

1) T_s point and measurement method:

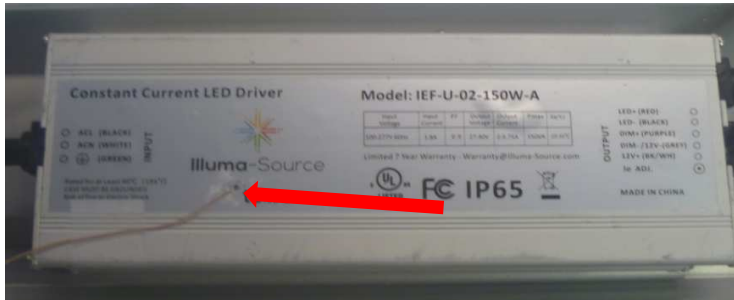
- ① Measure one point at the cathode pad, if necessary remove PSR of PCB to reach T_s point.

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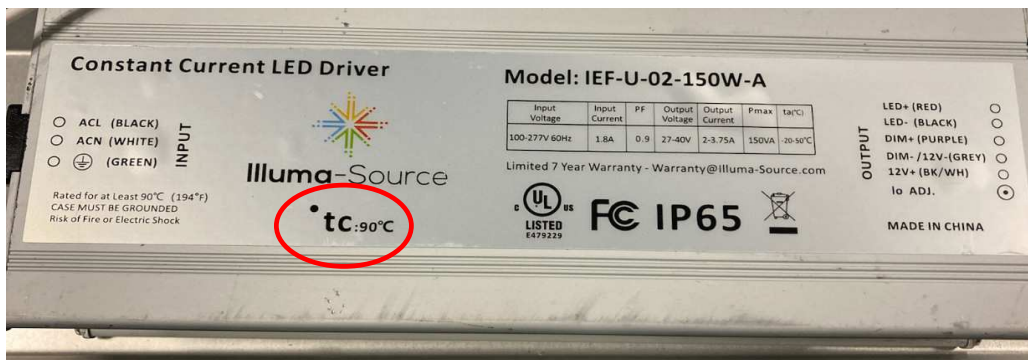
DRIVER MEASUREMENTS AND RATINGS

Measured Case Temp - Td (°C)	Max Case Temp (°C)
73.6	90.0

ISTMT Photo - Td



DRIVER MANUFACTURER'S SUPPORTING DOCUMENTATION



EQUIPMENT LIST

REPORT NO. 104920550CRT-001

#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Elgar AC Power Supply	CW1251	---	VBU	VBU
2	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
3	Traceable Hygrothermometer	4800	L206	2/12/2021	2/12/2022
4	Yokogawa Power Analyzer	WT1600	E474	6/15/2021	6/15/2022
5	Fluke Thermometer	53 II	D587	2/5/2021	2/5/2022
6	Fluke Multimeter	87V	D589	3/29/2021	3/29/2022
7	3M Integrating Sphere Spectrometer System	CDS 2600	---	1/3/2022	4/3/2022
8	Fisher Scientific Stopwatch	14-649-9	N1132	3/26/2021	3/26/2022
9	LSI High Speed Mirror Goniophotometer	6440	---	1/3/2022	4/3/2022
10	Elgar AC Power Supply	CW1251	---	VBU	VBU
11	Yokogawa Power Analyzer	WT210	E464	5/11/2021	5/11/2022
12	Traceable Hygrothermometer	4800	L204	2/21/2021	2/21/2022
13	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
14	Omega Thermometer	DPI8-C24	M263	3/23/2021	3/23/2022
15	Bosch Distance Laser	Pro GLM 20	L211	3/3/2021	3/3/2022
16	M-D Building Products Digital Level	Smart Tool	L112	5/26/2021	5/26/2022
17	Tape Measure	Crescent	--	9/21/2021	9/21/2024
18	Digital Thermometer	Fluke 53II	T1318	4/21/2021	4/21/2022
19	Fluke Multimeter	87V	D590	8/4/2021	8/4/2022

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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