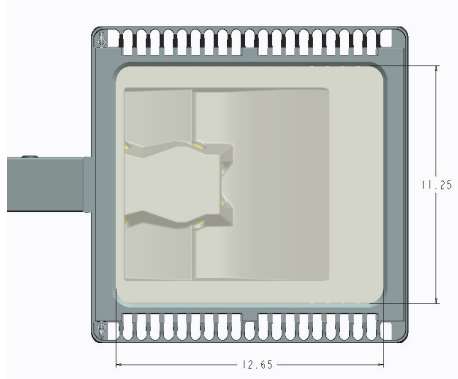
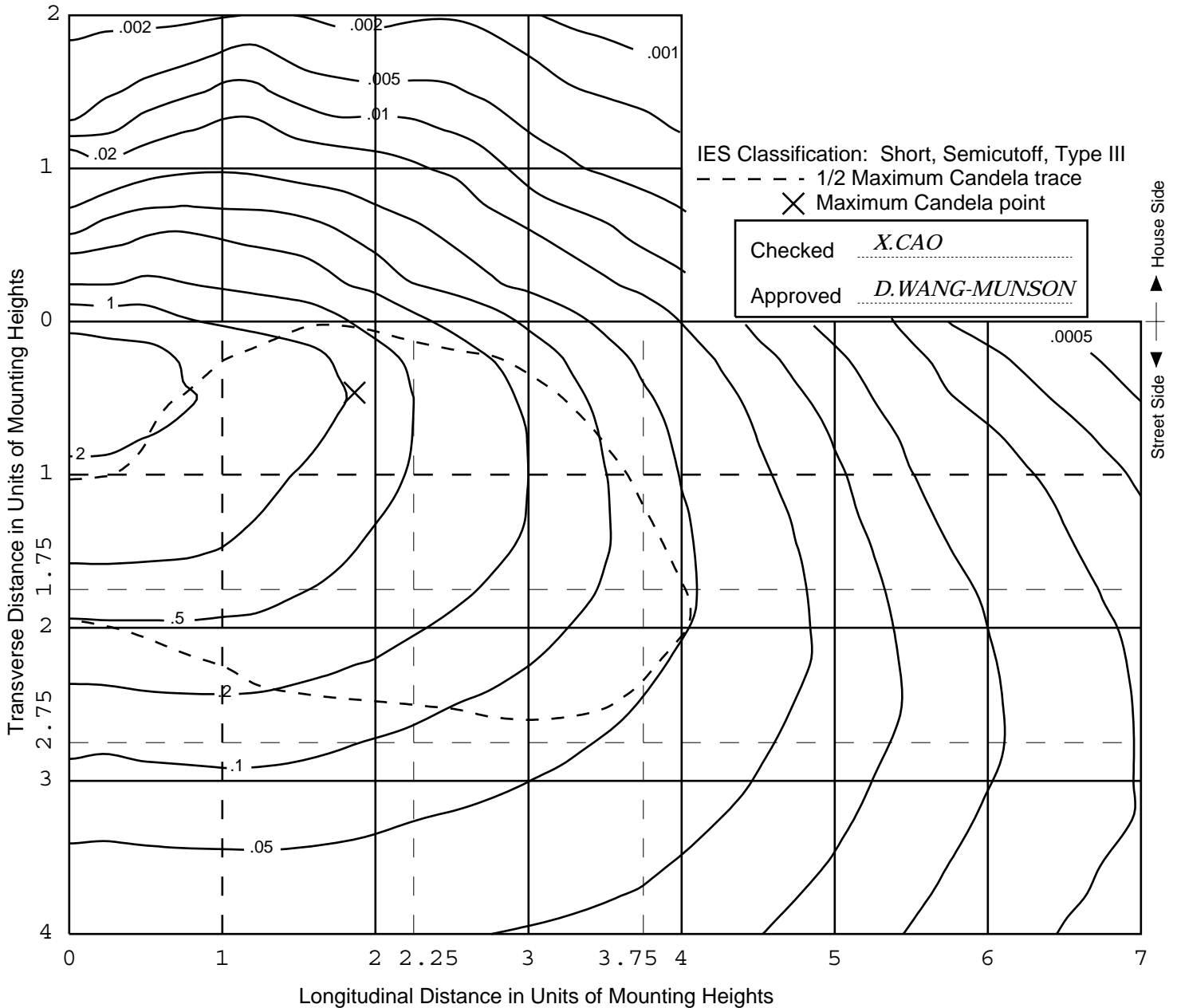


ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 25 foot mounting height.



REPORT NUMBER: RAB02147
 ISSUE DATE: 06/24/16 PAGE: 1 OF 9
 DATE SAMPLE TESTED: 06/24/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED3T78 - RWLED3T78 - RWLED3T78SF - WPLED3T78 (TYPE III)
 LUMINAIRE: CAST FINNED METAL HOUSING, 6 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE PAINTED METAL LENS FRAME.
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB02147
ISSUE DATE: 06/24/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 2 OF 9
DATE SAMPLE TESTED: 06/24/16

ADDITIONAL INFORMATION

LAMPS: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDS), 2 LEDES TILTED 63-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 75-DEGREES FROM STRAIGHT AHEAD, 2 LEDES TILTED 67-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 68-DEGREES FROM STRAIGHT AHEAD, 2 LEDES TILTED 58-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 40-DEGREES FROM STRAIGHT AHEAD.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.

TOTAL INPUT WATTS = 76.764 W AT 120.0 VAC.

LED DRIVER: RD-085-A2000

TEST PROCEDURE: IESNA LM-79-08

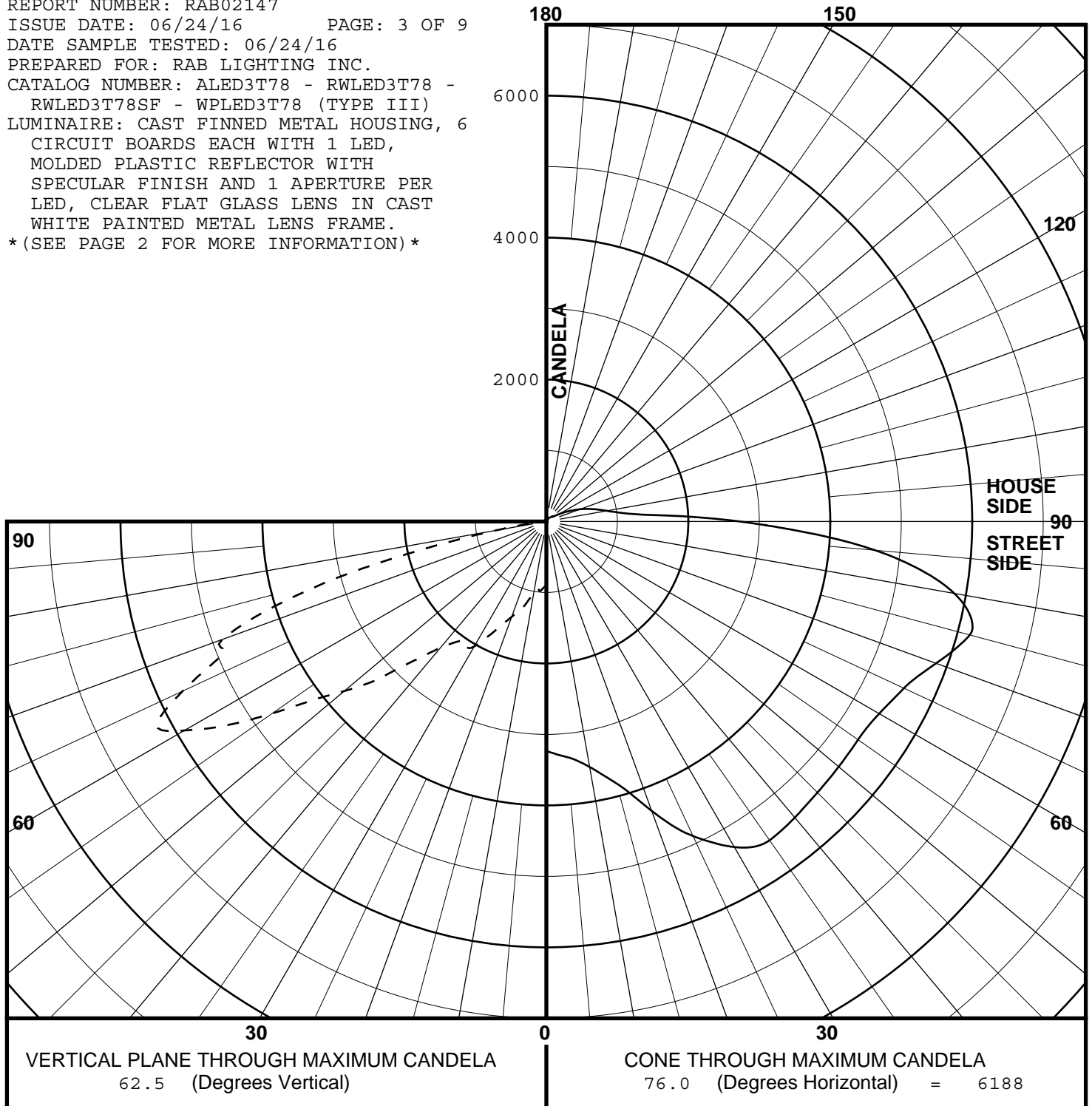
ACCREDITED LABORATORY CODE 201058-0

TEST DISTANCE : 28.25 FEET

NOTE: THIS REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

REPORT NUMBER: RAB02147
 ISSUE DATE: 06/24/16 PAGE: 3 OF 9
 DATE SAMPLE TESTED: 06/24/16
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED3T78 - RWLED3T78 -
 RWLED3T78SF - WPLED3T78 (TYPE III)
 LUMINAIRE: CAST FINNED METAL HOUSING, 6
 CIRCUIT BOARDS EACH WITH 1 LED,
 MOLDED PLASTIC REFLECTOR WITH
 SPECULAR FINISH AND 1 APERTURE PER
 LED, CLEAR FLAT GLASS LENS IN CAST
 WHITE PAINTED METAL LENS FRAME.
 (SEE PAGE 2 FOR MORE INFORMATION)



REPORT NUMBER: RAB02147

PAGE: 4 OF 9

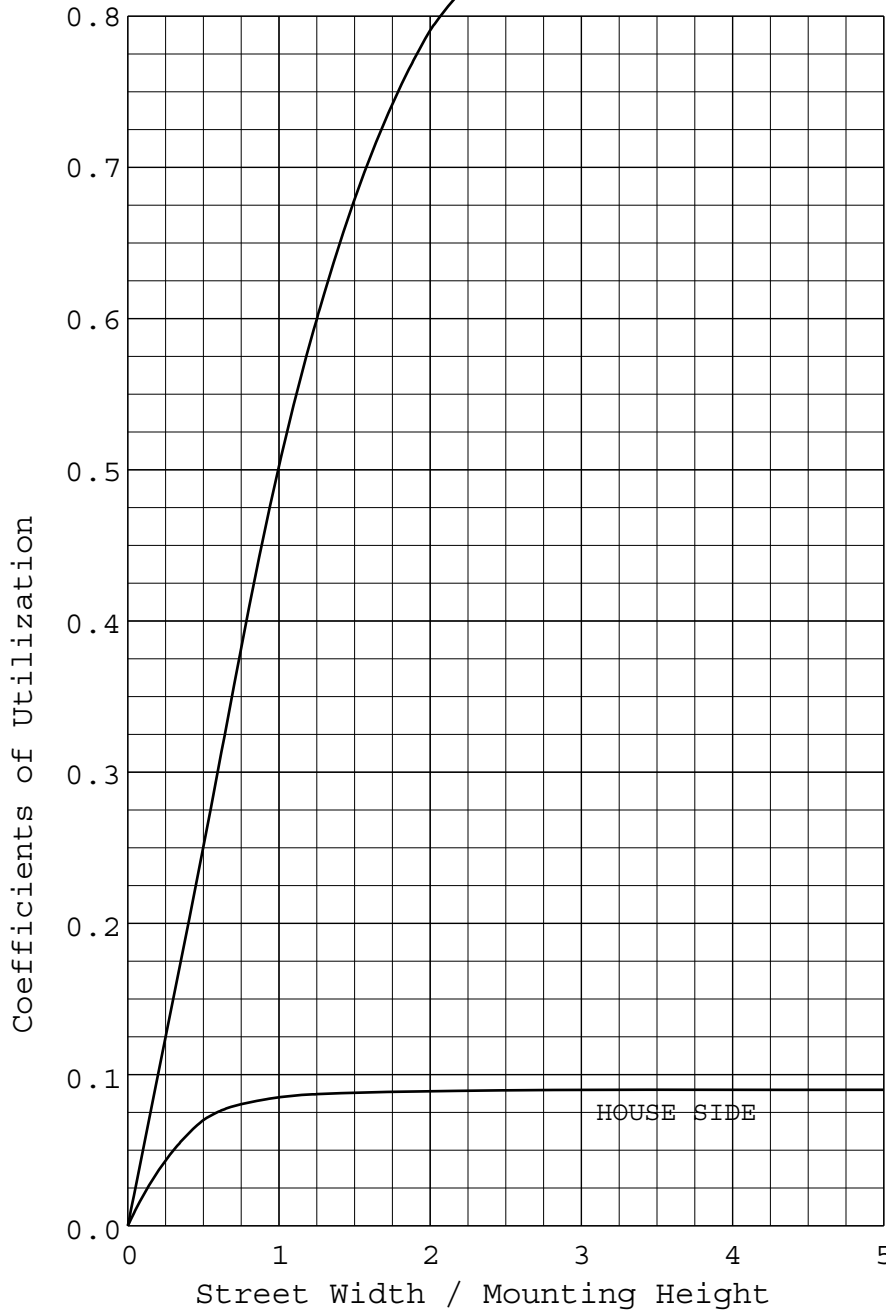
ISSUE DATE: 06/24/16

STREET SIDE

DATE SAMPLE TESTED: 06/24/16

PREPARED FOR: RAB LIGHTING INC.

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	8427.	91.0
DOWNWARD HOUSE SIDE	837.	9.0
DOWNWARD TOTAL	9263.	100.0
UPWARD STREET SIDE	0.	0.0
UPWARD HOUSE SIDE	0.	0.0
UPWARD TOTAL	0.	0.0
TOTAL FLUX	9263.	100.0

TOTAL INPUT WATTS = 76.8
EFFICACY = 120.6 Lm/W

ALL CANDELA AND LUMENS IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.

REPORT NUMBER: RAB02147
 ISSUE DATE: 06/24/16
 PREPARED FOR: RAB LIGHTING INC.

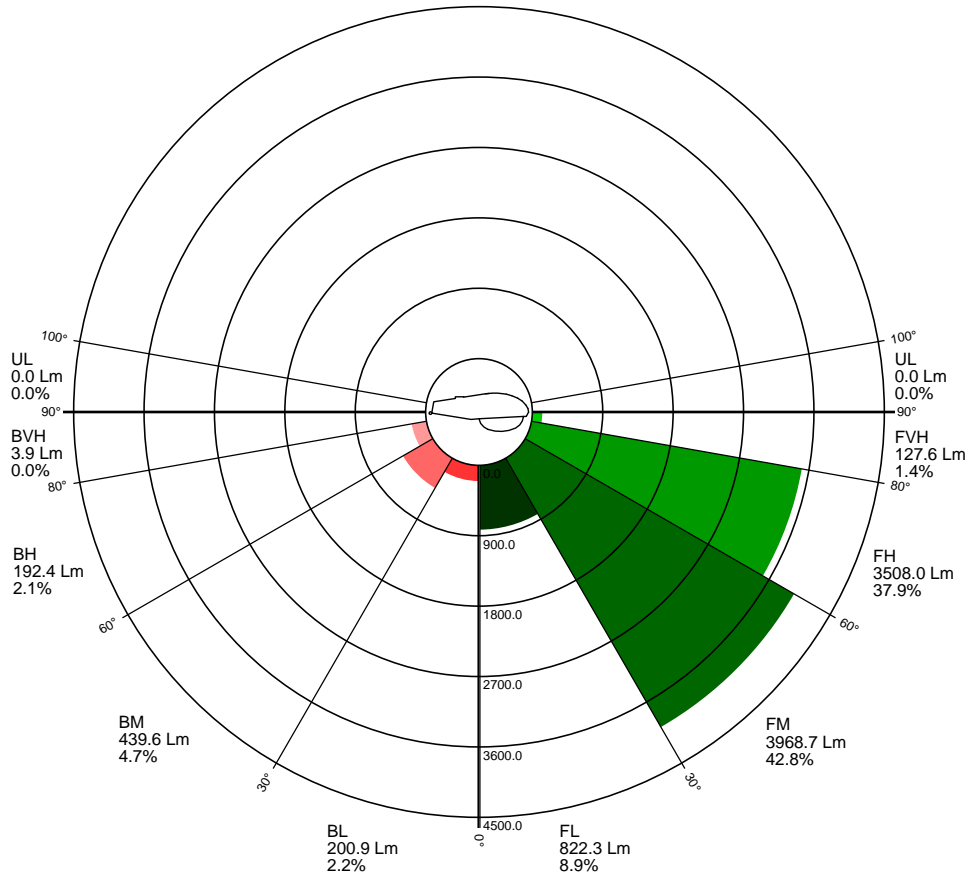
PAGE: 5 OF 9
 DATE SAMPLE TESTED: 06/24/16

BUG Rating:			B1	U0	G2
Zonal Summary	Lumens	% of Fixture	Zone Ratings		
			B	U	G
Forward	8427	91.0			
FL (0° - 30°)	822.3	8.9			
FM (30° - 60°)	3968.7	42.8			
FH (60° - 80°)	3508.0	37.9			G2
FVH (80° - 90°)	127.6	1.4			G2
Backward	837	9.0			
BL (0° - 30°)	200.9	2.2	B1		
BM (30° - 60°)	439.6	4.7	B1		
BH (60° - 80°)	192.4	2.1	B1		G1
BVH (80° - 90°)	3.9	0.0			G0
Upward	0	0.0			
UL (90° - 100°)	0.0	0.0		U0	
UH (100° - 180°)	0.0	0.0		U0	
Trapped Light	0	0.0			
Total Flux	9263	100.0			

Zonal Lumen Summary

(Linear scale)

UH
0.0 Lm
0.0%

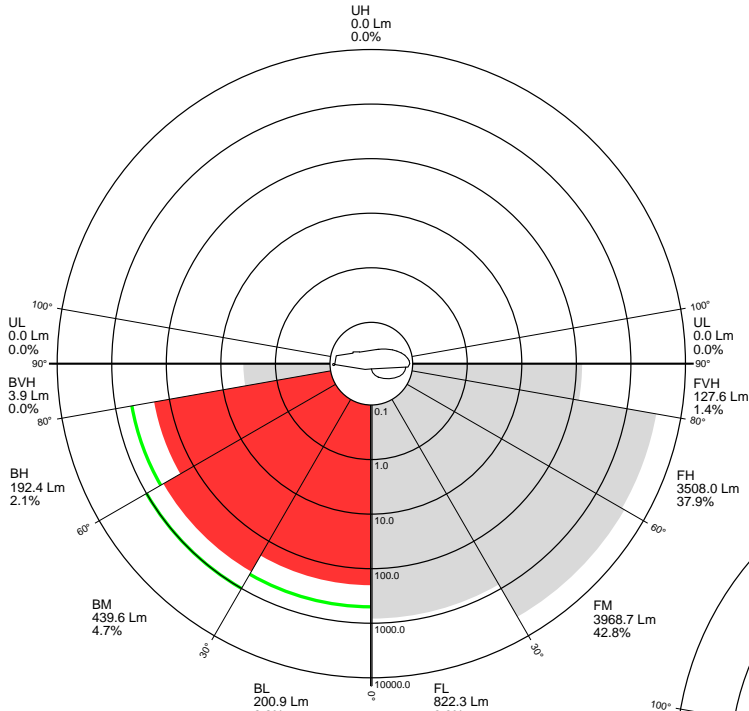


REPORT NUMBER: RAB02147
 ISSUE DATE: 06/24/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 6 OF 9
 DATE SAMPLE TESTED: 06/24/16

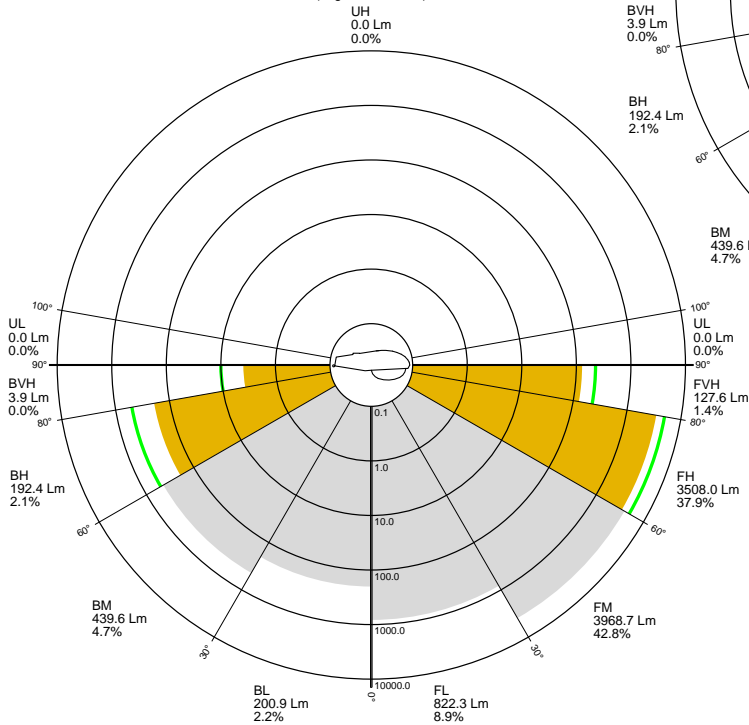
Backlight Rating Details

(Logarithmic scale)



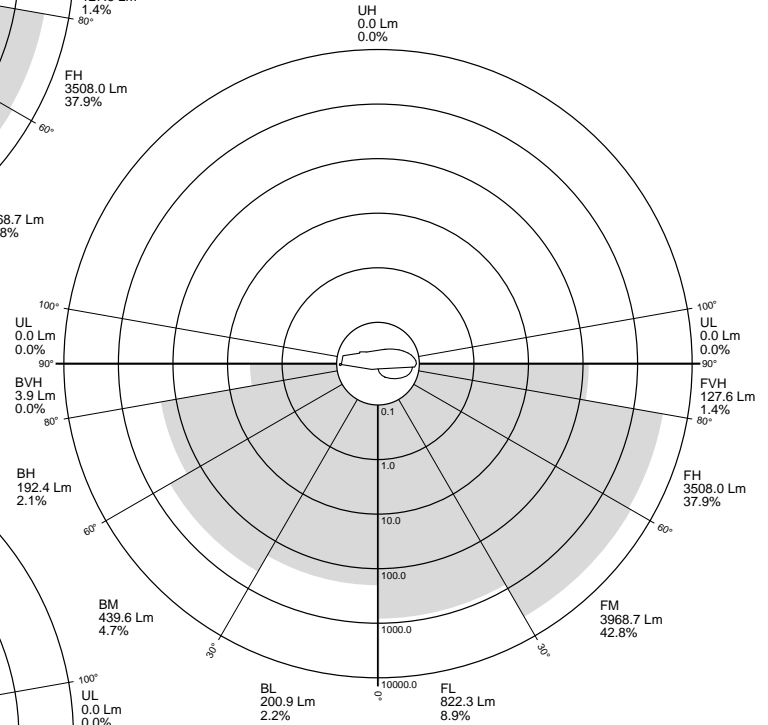
Glare Rating Details

(Logarithmic scale)



Uplight Rating Details

(Logarithmic scale)



REPORT NUMBER: RAB02147
 ISSUE DATE: 06/24/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 7 OF 9
 DATE SAMPLE TESTED: 06/24/16

CANDELA TABULATION

	LATERAL ANGLE											
	STREET SIDE	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	76.0	85.0
	180.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	4.	5.	8.	8.	13.	20.	13.	14.	10.	10.	8.
	85.0	30.	29.	65.	100.	126.	138.	108.	148.	87.	65.	16.
V	82.5	82.	107.	216.	305.	478.	628.	529.	585.	319.	263.	72.
E	80.0	214.	284.	458.	793.	1054.	1649.	1803.	1635.	821.	722.	276.
R	77.5	705.	760.	960.	1445.	1796.	2438.	2945.	3120.	1916.	1694.	886.
T	75.0	1230.	1222.	1467.	1878.	2325.	2961.	3840.	4262.	3153.	3018.	1768.
I	72.5	1515.	1501.	1819.	2341.	2834.	3500.	4597.	5190.	4221.	4079.	2695.
C	70.0	1780.	1724.	2117.	2763.	3440.	4811.	5130.	5480.	4929.	4860.	3214.
A	67.5	1999.	1995.	2484.	3243.	4567.	5419.	5495.	5497.	5006.	4967.	3432.
L	65.0	2346.	2455.	3075.	3984.	5228.	5433.	5546.	5822.	5625.	5654.	3957.
	62.5<<	3233.	3332.	3820.	4891.	5483.	5401.	5360.	5558.	6176.	6188.	4655.
A	60.0	3999.	4161.	4537.	5019.	5393.	5219.	5166.	5555.	5950.	5890.	4468.
N	57.5	4247.	4216.	4387.	4556.	4850.	4739.	4837.	5586.	5403.	5348.	4159.
G	55.0	3850.	3829.	4048.	4185.	4182.	4343.	4586.	5175.	4805.	4714.	3623.
L	52.5	3577.	3559.	3722.	3667.	3693.	4135.	4500.	4763.	4181.	4123.	3050.
E	50.0	3402.	3385.	3393.	3283.	3488.	3976.	4242.	4369.	3775.	3718.	2684.
	47.5	3203.	3173.	3171.	3144.	3383.	3738.	3770.	3750.	3426.	3351.	2410.
	45.0	3039.	3026.	3024.	3202.	3224.	3427.	3512.	3343.	3023.	2904.	2099.
	42.5	3018.	3026.	3046.	3205.	3073.	3276.	3246.	3020.	2661.	2575.	1891.
	40.0	2926.	2918.	2948.	3252.	2917.	3172.	2982.	2790.	2384.	2322.	1689.
	37.5	2800.	2819.	2893.	3060.	3010.	3023.	2763.	2690.	2212.	2157.	1570.
	35.0	2875.	2889.	2835.	2942.	2919.	2797.	2691.	2651.	2110.	2047.	1524.
	30.0	2964.	2935.	2700.	2675.	2588.	2447.	2500.	2451.	2086.	2034.	1459.
	25.0	2797.	2764.	2452.	2343.	2313.	2357.	2311.	2060.	1739.	1693.	1271.
	20.0	2611.	2604.	2426.	2252.	2217.	2147.	1997.	1775.	1463.	1430.	1119.
	15.0	2339.	2331.	2267.	2085.	1934.	1794.	1677.	1514.	1266.	1243.	1022.
	10.0	1936.	1935.	1925.	1798.	1672.	1511.	1338.	1186.	1035.	1025.	906.
	5.0	1414.	1424.	1388.	1312.	1304.	1223.	1144.	1062.	988.	982.	920.
	0.0	893.	893.	893.	893.	893.	893.	893.	893.	893.	893.	893.

||
 PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB02147
 ISSUE DATE: 06/24/16
 PREPARED FOR: RAB LIGHTING INC.

PAGE: 8 OF 9
 DATE SAMPLE TESTED: 06/24/16

CANDELA TABULATION
 HOUSE SIDE

LATERAL ANGLE

	90.0	95.0	105.0	115.0	125.0	135.0	145.0	155.0	165.0	175.0	180.0
	180.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	7.	7.	7.	7.	6.	6.	5.	4.	3.	3.
	85.0	10.	9.	8.	7.	6.	6.	5.	4.	3.	4.
V	82.5	19.	15.	11.	8.	7.	6.	5.	4.	4.	4.
E	80.0	127.	81.	39.	21.	8.	5.	5.	4.	4.	4.
R	77.5	491.	271.	90.	43.	9.	6.	5.	4.	5.	5.
T	75.0	1085.	441.	147.	56.	23.	8.	5.	5.	6.	7.
I	72.5	1582.	662.	198.	106.	61.	19.	6.	6.	7.	8.
C	70.0	2000.	876.	387.	182.	70.	25.	14.	7.	7.	8.
A	67.5	2051.	981.	523.	235.	79.	36.	25.	9.	9.	9.
L	65.0	2233.	1008.	589.	284.	103.	53.	47.	14.	10.	10.
	62.5<<	2727.	1206.	680.	340.	131.	90.	65.	23.	13.	11.
A	60.0	2907.	1318.	766.	373.	161.	129.	70.	31.	18.	13.
N	57.5	2880.	1394.	787.	473.	192.	143.	75.	36.	20.	13.
G	55.0	2591.	1370.	752.	480.	211.	146.	83.	43.	23.	13.
L	52.5	2217.	1382.	724.	459.	241.	154.	89.	49.	27.	13.
E	50.0	1974.	1425.	706.	468.	278.	170.	98.	52.	31.	22.
	47.5	1804.	1356.	732.	494.	326.	191.	114.	59.	34.	46.
	45.0	1618.	1250.	739.	484.	346.	210.	134.	66.	47.	41.
	42.5	1456.	1150.	743.	476.	365.	229.	151.	79.	50.	35.
	40.0	1348.	1087.	734.	473.	386.	249.	156.	104.	68.	50.
	37.5	1292.	1081.	750.	474.	387.	260.	171.	104.	79.	62.
	35.0	1295.	1108.	782.	485.	386.	268.	197.	122.	83.	65.
	30.0	1235.	1088.	816.	545.	391.	336.	227.	156.	112.	90.
	25.0	1120.	999.	797.	617.	409.	298.	229.	168.	126.	117.
	20.0	1003.	903.	737.	620.	484.	337.	248.	196.	162.	147.
	15.0	943.	884.	744.	641.	549.	462.	383.	334.	313.	313.
	10.0	861.	820.	735.	649.	595.	560.	532.	498.	471.	428.
	5.0	892.	868.	818.	773.	728.	697.	661.	627.	607.	593.
	0.0	893.	893.	893.	893.	893.	893.	893.	893.	893.	893.

CONE OF MAXIMUM CANDELA

REPORT NUMBER: RAB02147
ISSUE DATE: 06/24/16
PREPARED FOR: RAB LIGHTING INC.

PAGE: 9 OF 9
DATE SAMPLE TESTED: 06/24/16

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	22
5- 10	71
10- 15	129
15- 20	194
20- 25	263
25- 30	344
30- 35	431
35- 40	510
40- 45	612
45- 50	750
50- 55	935
55- 60	1171
60- 65	1255
65- 70	1100
70- 75	858
75- 80	487
80- 85	123
85- 90	9
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	93
0- 20	416
0- 30	1023
0- 40	1964
0- 50	3326
0- 60	5432
0- 70	7787
0- 80	9132
0- 90	9263
0-100	9263
0-110	9263
0-120	9263
0-130	9263
0-140	9263
0-150	9263
0-160	9263
0-170	9263
0-180	9263

REPORT NUMBER: RAB02146 Page 1 of 4
DATE: 6/27/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: ALED3T78 - RWLED3T78 - RWLED3T78SF - WPLED3T78 (TYPE III)

ADDRESS: 170 LUDLOW AVE, NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING, 6 CIRCUIT BOARDS EACH WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE PAINTED METAL LENS FRAME.

LAMP: SIX WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDS), 2 LEDES TILTED 63-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 75-DEGREES FROM STRAIGHT AHEAD, 2 LEDES TILTED 67-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 68-DEGREES FROM STRAIGHT AHEAD, 2 LEDES TILTED 58-DEGREES FROM VERTICAL BASE-UP POSITION AND CANTED 40-DEGREES FROM STRAIGHT AHEAD.

DRIVER: RD-085-A2000

OBJECT OF TEST: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT THE RATED INPUT VOLTAGES (120.0 AND 277.0 VAC, 60Hz) TO THE TEST SAMPLE.

INSTRUMENTS: GWINSTEK PROGRAMMABLE AC POWER SOURCE APS-7100 Calibration Due: N/A
CHROMA PROGRAMMABLE DIGITAL POWER METER MODEL 66202 2/26/17
OCEAN OPTICS QE65PRO Spectroradiometer 5/31/17
RAB 2.0 meter Diameter Integrating Sphere, 4PI Geometry 5/31/17

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRIa,1-14), Chromaticity Coordinates (x,y; u'v'), ANSI C78.377 Duv, and electrical data including ANSI C82.77-2002 Power Factor (PF), and Total Harmonic Distortion (THD) to the test sample. Measure electrical data including Total Harmonic Distortion (THD) at maximum nominal rated input voltage. Report Off-State Power.

PROCEDURE: The test sample was mounted inside the integrating sphere, energized, and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 60 HZ input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All data are traceable to the National Institute of Standards and Technology. Off-State Power was reported with no voltage applied to the sample.

*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

RESULTS: (continued subsequent pages)

Checked	<u>X.CAO</u>
Approved	<u>D.WANG-MUNSON</u> Lighting Engineer

REPORT NUMBER: RAB02146 Page 2 of 4
 DATE: 6/27/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED3T78 - RWLED3T78 - RWLED3T78SF - WPLED3T78 (TYPE III)

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	9236 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3498
Chromaticity Ordinate y	0.3710
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2072
Chromaticity Ordinate v'	0.4945
Correlated Color Temp CCT (K)	4899
ANSI C78.377-2008 Duv	0.008
Total Radiant Flux (milliWatts)	26525 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.643
Input Power (Watts)	76.8
Input Power Factor (%)	99.5
Input Current THD (%)	4.7
Input Voltage THD (%)	0.2
EFFICACY (Lumens/Watt)	
120.3	
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.289
Input Power (Watts)	75.1
Input Power Factor (%)	93.7
Input Current THD (%)	13.9
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
0.0	

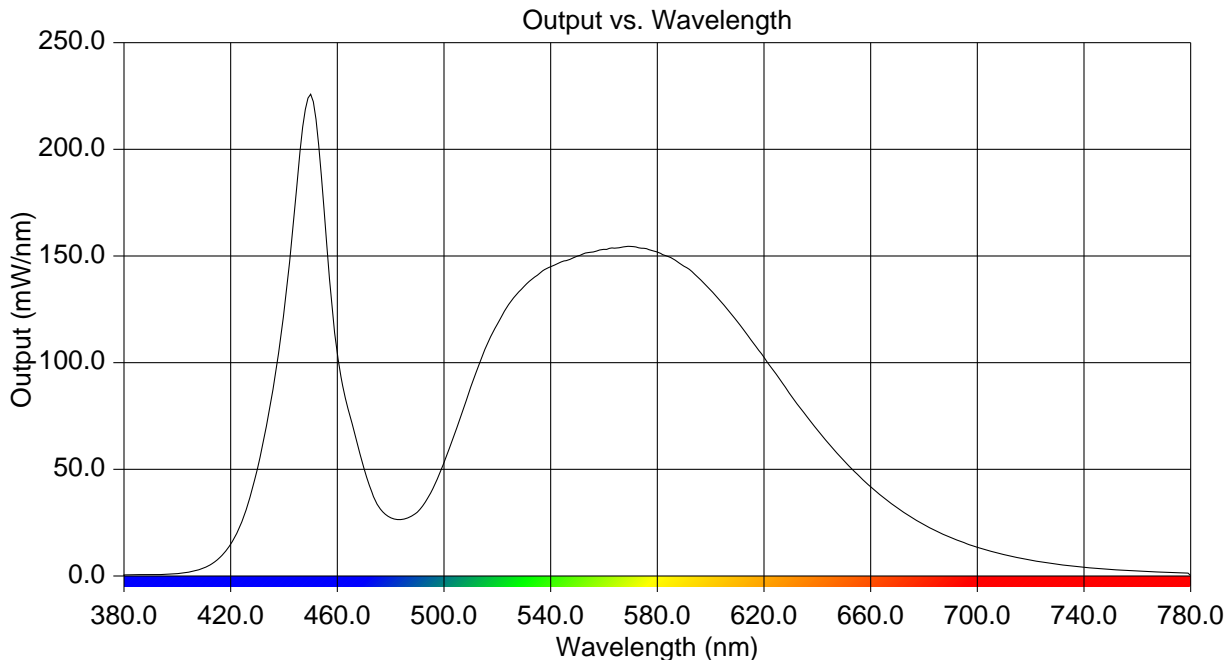
COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	71
R1 Light greyish red	67
R2 Dark greyish yellow	75
R3 Strong yellowish green	82
R4 Moderate yellowish green	70
R5 Light bluish green	67
R6 Light blue	66
R7 Light violet	82
R8 Light reddish purple	54
R9 Strong red	-39
R10 Strong yellow	42
R11 Strong green	66
R12 Strong blue	36
R13 Light yellowish pink (skin)	68
R14 Moderate olive green (leaf)	90

*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

REPORT NUMBER: RAB02146 Page 3 of 4
 DATE: 6/27/2016
 PREPARED FOR: RAB LIGHTING INC.
 CATALOG NUMBER: ALED3T78 - RWLED3T78 - RWLED3T78SF - WPLED3T78 (TYPE III)

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.493	515	105.082	650	53.928
385	0.569	520	118.037	655	47.710
390	0.607	525	128.598	660	41.767
395	0.784	530	135.698	665	36.582
400	1.153	535	140.964	670	31.942
405	1.941	540	145.128	675	27.778
410	3.832	545	147.686	680	24.051
415	7.592	550	149.831	685	20.802
420	14.885	555	151.759	690	18.025
425	28.262	560	153.058	695	15.671
430	50.031	565	153.712	700	13.429
435	81.484	570	154.482	705	11.612
440	123.109	575	153.614	710	9.994
445	185.810	580	151.882	715	8.620
450	225.841	585	149.228	720	7.437
455	172.198	590	145.252	725	6.383
460	104.144	595	140.117	730	5.495
465	73.883	600	134.051	735	4.775
470	50.422	605	126.826	740	4.085
475	33.635	610	119.285	745	3.540
480	27.174	615	110.865	750	3.076
485	26.696	620	102.521	755	2.660
490	29.916	625	94.008	760	2.307
495	38.907	630	84.751	765	2.005
500	53.186	635	76.522	770	1.752
505	70.097	640	68.465	775	1.518
510	88.474	645	60.978	780	0.229



REPORT NUMBER: RAB02146 Page 4 of 4
DATE: 6/27/2016
PREPARED FOR: RAB LIGHTING INC.
CATALOG NUMBER: ALED3T78 - RWLED3T78 - RWLED3T78SF - WPLED3T78 (TYPE III)

CIE Chromaticity Diagram

